CHAPTER THREE
EXPORT INSTABILITY AND EXPORT CONCENTRATION

3.1 Introduction

Not all findings support the argument that commodity concentration is an important source of export instability (for instance, see MacBean,1966; Massell,1970; Knudsen and Parnes,1975). Nevertheless, many advocates of diversification have attributed this diversity in empirical findings to methodological reasons (Love,1983,p.787;1990,pp.324-328). Some of the methodological issues, for instance, include incorrect model specification, inadequacy of concentration indices and cross-country studies, and different measurements of export instability, as discussed earlier (see Chapter One,pp.14-21).

Earlier studies of export instability in Malaysia were based primarily on the Hirschman-Gini coefficient or its equivalent as a measure of commodity and/or geographic concentration (for example, see Lee,1977; Pang and MmBaga,1982). It is argued that the index does not consider the interrelationships among commodity exports or country exports. This study takes the argument on concentration led-export instability a step further. In particular, by identifying the characteristics found in the relationship between export concentration and export instability. In addition, as Malaysia's export structure has shifted away from concentration on two primary commodities towards a more diversified basket of exports, it is timely to examine the *a priori* argument that diversification would lead to lower export instability, at least in the Malaysian case. Essentially, this study reviews the effectiveness of the diversification process in insulating the economy from external trade disturbances.

The present analysis of export instability in this study covers a more recent period - 1968 to 1991. The rest of the chapter is organized as follows. The second section explains the index used in this study to measure export instability. The third section gives further details of the model used. The data covered in the analysis are discussed in the fourth section. The empirical results are presented and discussed in the fifth section while the conclusions are contained in the final section.

3.2 Measure of Export Instability

The Gini-Hirschman coefficient of commodity or geographic concentration for exports commonly used in the earlier studies to measure concentration is given as follows:

$$c_t = 100\sqrt{\sum_{i=1}^{n}(X_{it} / X_t)^2}$$

where X_{it} = the value of exports of commodity i in year t

$X_t = \sum X_t$ (total export earnings in that year)

The assumption is that there is statistical independence among commodities or markets. MacBean and Nguyen (1980) argue that when the assumption is violated, there is no guarantee that a reduction in the concentration of exports will reduce export instability. In particular, MacBean and Nguyen (1980) showed that the same extent of concentration could be associated with different levels of instability[1]. This suggests that the relationship

[1]Following MacBean and Nguyen's mathematical model, suppose that two commodities, commodity I and commodity II, have instability indices of 10 per cent and 40 per cent respectively. Suppose their export shares in total exports amount to 80 per cent for Commodity I and 20 per cent for Commodity II. The resulting instability index of total exports consisting of only commodities I and II is 8 per cent. However, when their shares are changed to 20 per cent for Commodity I and 80 per cent for commodity II, the

between instability index and concentration index may be weak or that one should examine in greater detail the nature of the commodities.

MacBean and Nguyen (1980,p.357) argue that the simple relationship between concentration and export instability holds only where the export instability indices are the same or vary to a small extent for all commodities. This leads to the suggestion that eventhough diversification lowers commodity concentration, an overall increase in instability could occur if there is an increase in the average level of instability among the individual commodities. Kumar Das and Pant (1989) point out that the average level of instability among individual commodities would increase if goods which account for a higher export share, as a result of diversification, are the ones with higher export earnings instability compared to goods which lose their export share. In this case, reducing commodity concentration does not ensure a reduction in total export earnings instability.

Further, if movements in export earnings from different commodities are correlated, then the relationship between the instability of total export earnings and commodity concentration will also be affected. Kumar Das and Pant (1989) argue that during trade depressions or trade booms, the covariances between commodities' export earnings will take large positive values because export earnings from individual commodities often tend to move in the same direction[2]. These positive covariances serve to compound the problem of export earnings instability. During normal periods however,

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instability index of total export earnings could rise to 26 per cent although the concentration index is the same (MacBean and Nguyen,1980,p.358).

[2]Cyclical factors in world trade which stem mainly from the cyclical character of industrial activity in developed economies, could cause the prices of most commodities to move in the same direction thus causing unstable demand patterns. The assumption here is that shifts in the demand schedules account a large part of the fluctuation in export earnings as there is less reason to expect a high degree of correlation between the supply schedules of different products.

the effects of price and quantity movements of these commodities on export instability is expected to be much less[3].

In view of the above arguments, we adopt the MacBean-Nguyen export instability index which permits the identification of the elements central to the debate on diversification. The index may be decomposed into three components:

(i) export concentration

(ii) different weighted levels of export earnings instability for individual commodities and,

(iii) the covariances between individual export commodities.

Kumar Das and Pant (1989) have explicitly argued that the second component reveals the deviations of individual commodity exports from trend values. On the other hand, the third component shows the distribution of the said deviations around the trend line. We follow Kumar Das and Pant's detailed breakdown of the MacBean-Nguyen model of export instability. To arrive at the model used, we must first define export instability with reference to trend[4].

When constructing an export instability index, it is necessary first to eliminate the trend. Failure to eliminate the trend would mean a country whose exports grows or declines at a constant rate from one period to the next would reveal artificially high export instability (Massell,1970). Glezakos (1983) argued that the choice of the trend used for the estimation of the residual variability in export earnings cannot be made arbitrarily, but should be dictated by the actual performance of the country's exports over time.

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[3]Kumar Das and Pant (1989,p.67), contend that during normal periods, the export concentration index after taking into account the average level of instability would be sufficient to explain export earnings instability.

[4]The literature on export instability defines export instability as the measurement of short-term or yearly fluctuations of export proceeds around the growth trend of exports (Naya,1973,p.630).

Different trend forms have been adopted in past studies. No evidence exists to suggest which type of trend is more appropriate. Nevertheless, Kenen and Voivodas (1972) pointed out that the moving-average method suffers from competing weaknesses. *"If the time span of the average is made too short, the moving-average will include too many short-term movements in exports, and the corresponding index of residuals will understate instability"* (Kenen and Voivodas,1972,p.793). However, if the average is made too long, it will take up too little of the secular movement, and the residuals will overstate instability. Furthermore, it would also have meant a serious reduction in the number of observations. The regression method, on the other hand, could avoid this particular dilemma. However, it provides a very rigid description of the underlying pattern/trend in the export series (Kenen and Voivodas,1972,p.793).

Nevertheless, the approach adopted here employs the regression method, and follows Cuddy and Della Valle's (1978) argument that the choice between various trend forms is based on the "goodness-of-fit" criterion. This is indicated by the adjusted coefficients of determination obtained from the regressions. In the case of Malaysia's principal export commodities (defined at the SITC two-digit level), the polynomial function of degree three proves to be better than other trend forms during the 1968-91 period[5].

The sample period (1968-91) includes the turbulent years of the 1970s and 1980s. In particular, it includes the oil shock years of 1973 and 1979, the commodity price boom years of 1972-74, and the early 1980s during which the prices of a wide range of primary commodities fell. There was a further collapse of commodity prices across the board during the mid-1980s. All of these disturbances have affected total export earnings instability. Under these conditions, it is not surprising to find that an exponential growth

[5]Regressions of Malaysia's export earnings are run against different trend forms in turn, namely, linear, exponential and polynomials of degrees two and three.

trend function which exhibits a constant percentage rate of growth, for instance, results not only in lower adjusted coefficients of determination (adjusted R^2), but is also expected to produce artificially higher degrees of export earnings instability.

To permit comparability among instability indices across different export commodities, a single definition of and correction for trend is desirable and hence is used for all commodities (see Kingston,1973,p.382). Kingston also argues that employing a single trend measure is consistent with the concept of the stability of an economic time series over a period of years[6]. It must be added that the measure of export instability in this study is mainly concerned with short-term fluctuations in exports earnings[7].

It should be noted here that the choice of trend form describes the growth path of the 62 commodities (defined at the SITC two-digit level) to varying degrees of accuracy. Nevertheless, the degree of inaccuracy is not substantial as 49 out of the 62 commodity groups displayed a better fit (based on the adjusted R^2) when the polynomial trend of degree three was used as compared with the exponential and other trend forms. Further, the chosen trend form fits particularly well for Malaysia's major export commodities, that is SITC two-digit groups 23 (Crude Rubber), 24 (Cork and Wood), 34 (Gas, natural and manufactured), 42 (Fixed Vegetables Oils and Fats), 43 (Animal or Vegetables Oils, processed), 63 (Cork and Wood Manufactures), 65 (Textile yarn, Fabrics and Manufactures), 68 (Non-ferrous Metals), 74 (General Industrial Machinery and Equipment), 75 (Office Machinery and Data Processing Machinery), 76

[6]An alternative is to divide the sample period into short subperiods to enable the trend to change from period to period. However, the best fit criterion was adopted over this approach due to the relatively small sample period covered in our study. The subperiods covered will be too small for any time series to be examined.

[7]Short-term fluctuations receive considerable weight here in the determination of policy choices. MacBean (1966) argues that it is this sort of instability that bilateral or multi-lateral arrangements such as international buffer stock, compensatory financing scheme and marketing board scheme have been thought probable to overcome instability.

(Telecommunication and Sound Equipment), 77 (Electrical Machinery, Appliances), 79 (Other Transport Equipment), 84 (Articles and Apparel/Clothing) and 88 (Photographic Apparatus and Equipment) with the exception of SITC group 33 (Petroleum and Petroleum Products)[8] (see Appendix 3.1). These SITC groups alone accounted for an average of 87.7 per cent of Malaysia's total merchandize exports between 1968 and 1991.

3.3 The Model[9]

3.3.1 Commodity Concentration

Let X_{it} be the country's export earnings from commodity i in year t.

$\overline{X}_{it}$ is the trend value obtained by regressing X_{it} on time.

The percentage deviation of X_{it} from its trend value is given by:

$$U_{it} = \frac{X_{it} - \overline{X}_{it}}{\overline{X}_{it}}$$

[8]Commodity of SITC 33 is also one of Malaysia's major commodity exports. Its export trend, however, appears to follow more closely of a logarithmic function than a polynomial one, although the difference is small. The adjusted R^2 when an exponential trend is fitted, is 0.867582, compared with the polynomial trend which gives 0.851188. The polynomial export trends for the rest of the commodities under study are also found in Appendix 3.1. In cases where the value of the DW statistics are low, Tan (1983) argued that a generalised difference transformation of the variables should be carried out with the aim of correcting for first-order correlation in the residuals. In this study, the Cochrane-Orcutt iterative procedure is used to correct for serial correlations of the residuals.

[9]The study here follows closely the approach taken by Kumar Das and Pant (1989).

Looking into Malaysia's 62 major categories of merchandize exports, the percentage deviation of total export earnings from its trend is given by:

$$U_t = \frac{X_t - \bar{X}_t}{\bar{X}_t},$$

where $X_t = \sum X_{it}$ and
$\bar{X}_t = \sum \bar{X}_{it}$,

the variance of U_t is, $U_t^2 = \left[\sum_i^m \left(\frac{X_{it} - \bar{X}_{it}}{\bar{X}_{it}} \right) \left(\frac{\bar{X}_{it}}{\bar{X}_t} \right) \right]^2$

$$= \left[\sum U_{it} W_{it} \right]^2 \quad \text{..... (1)}$$

where W_{it} is the expected export share of commodity i and $\sum W_i = 1$.

Squaring the deviation from trend allows the measure to reflect better high values of deviations than are measures based on the sum of absolute deviations. The implicit assumption is that large deviations contribute proportionally more to uncertainty (Knudsen and Parnes,1975,p.10).

By expanding equation (1), we have:

$$U_t^2 = \sum_i^m U_{it}^2 W_{it}^2 + 2 \sum_{i \neq j}^m U_i W_i U_j W_j$$

$$= \sum_t^m W_{it}^2 \sum U_{it}^2 \cdot \frac{W_{it}^2}{\sum_i^m W_{it}^2} + 2 \sum_{i \neq j} U_i W_i U_j W_j \quad \text{..... (2)}$$

Equation (2) gives a clearer picture of the relationship between export earnings instability and commodity concentration. In particular, commodity export instability is subdivided into three components:

(i) commodity concentration:

$$\left(\sum_{i}^{m} W_{it}^2\right) = C_c$$

A higher value of C_c indicates higher commodity concentration[10]. This index of commodity concentration is the sum of weighted figures based on expected export shares in total export earnings.

(ii) weighted average level of instability of each commodity:

$$\left[\sum U_{it}^2 \cdot \frac{W_{it}^2}{\sum_{i}^{m} W_{it}^2}\right] = N_c$$

This term reveals the contribution of each export commodity to total export instability, and

(iii) interaction among instability levels of different export commodities

$$\left(2\sum_{i \neq j} W_{it} U_{it} W_{jt} U_{jt}\right) = I_c$$

[10]Squaring the weights stresses the importance of the instability of groups with the larger shares in total earnings. It is noted that although c is negatively related to the number of commodities, the value of c will differ according to the level of commodity classification used. Changes in this concentration index provide no indication as to which commodity groups have increased or decreased their shares in total earnings.

This term reveals the distribution of the deviations of commodity exports from trend values which affects total export instability.

The model can be rewritten as:

$$II_c = C_c N_c + I_c \quad \text{where}$$

C_c is the commodity concentration
N_c is the sum of the weighted average level of instability
$C_c N_c$ is the commodity concentration adjusted for the effects of variation amongst the individual commodity instability
I_c is the covariances in weighted commodity export instability indices
II_c is the commodity export instability

Hypothetically, there is a positive relationship between commodity concentration and export instability[11] and this favours export diversification. However, equation(2) shows that any negative relationship between export diversification and the instability of total export earnings will be weakened due to the presence of N_c and I_c. Hence, the effect of diversification on export instability depends on the weighted average instability level of individual commodities, and the correlation of instability among the commodities. Diversification *per se* does not ensure a reduction in the variance of total earnings unless: (a) there is diversification in favour of commodities with less instability, and (b) diversification is in favour of commodities which display lower degrees of movement in the same direction.

[11]The derivative of $\frac{\partial I}{\partial C} = N$ which is a positive value. N will take the value zero only when there is absence of instability in all the export commodities. As argued by Kumar Das and Pant (1989), this is an exception rather than a rule.

3.3.2. *Geographic Concentration*

Since diversification has both a commodity and geographic aspect, a similar analysis is extended to geographic diversification and export earnings instability. High geographic concentration is likely to imply greater dependence on economic conditions in one or a few countries. It is contended here that if export destinations are diversified, changes in export receipts caused by falls in certain countries' import demands can be offset by opposing changes in other countries, making total earnings more stable. This is based on the assumption that trade patterns are not identical and not positively correlated across countries (Knudsen and Parnes,1975,p.38).

Exports to 63 major trading countries are examined here. In Chapter 2, it was noted that the direction of trade flows in general has not changed much over the years. Nonetheless, there has been a small declining trend in the European Community's share of both Malaysian exports and imports. On the other hand, a noticeable rise in market share of the East-Asian NICs has been observed. It is pertinent to review this trend and to link geographic diversification to export earnings instability.

Using the same definition of and correction for trend, trend values of exports by geographic regions are thus obtained. Out of 63 countries in the sample, 49 obtained a better fit when the polynomial trend of degree three was used as compared with the exponential trend. The polynomial trend also fits better for Malaysia's major export markets which include the EEC[12], Singapore, Japan, the United States and the East-Asian NICs[13]. These markets accounted for 81.2 per cent of total exports in 1991.

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[12]This is with the exception of the Netherlands. Nevertheless, the adjusted R^2 when an exponential trend is fitted for exports to Netherlands is not much larger (0.757706) than for the polynomial trend (0.728456).

[13]The East Asian NICs consist of Korea, Taiwan and Hong Kong. The 'good fit' export trends of polynomial function for Malaysia's major trading partners and the rest are shown in Appendix 3.2.

The degree of instability of total export earnings in terms of export markets is measured by the percentage deviation of total exports from its trend, S_t. It is given as:

$$S_t = \frac{Y_t - \overline{Y}_t}{\overline{Y}_t}$$

where $Y_t = \sum Y_{it}$ and

$\overline{Y}_t = \sum \overline{Y}_{it}$

Y_{it} is total Malaysian exports to country i in year t and,

$\overline{Y}_{it}$ is the trend value obtained by regressing Y_{it} on time.

Its relationship to geographical concentration is defined in exactly in the same manner as that for commodity concentration. The variance of S_t is:

$$S_t^2 = \left[\sum_i^n \left(\frac{Y_{it} - \overline{Y}_{it}}{\overline{Y}_{it}}\right)\left(\frac{\overline{Y}_{it}}{\overline{Y}_t}\right)\right]^2$$
$$= \left[\sum S_{it} V_{it}\right] \quad \text{.....(3)}$$

Expanding equation (3), we have:

$$S_t^2 = \sum_i^n S_{it}^2 V_{it}^2 + 2\sum_{i \neq j}^n S_i V_i S_j V_j$$
$$= \sum_i^n S_{it}^2 \sum S_{it}^2 \frac{V_{it}^2}{\sum_i^n V_{it}^2} + 2\sum S_i V_i S_j V_j$$

Thus, geographic instability is subdivided into 3 components:

(i) Geographic concentration

$$\left(\sum_{i}^{n} V_{it}^{2}\right) = C_g$$

(ii) Weighted average level of instability of each export market:

$$\left[\sum S_{it}^{2} \frac{V_{it}^{2}}{\sum_{i}^{n} V_{it}^{2}}\right] = N_g$$

(iii) Interaction among the instability levels of different export markets:

$$\left[2\sum_{i \neq j} S_i V_i S_j V_j\right] = I_g$$

The relationship can be rewritten as follows:

$$II_g = C_g N_g + I_g \quad \text{where}$$

C_g is the geographic concentration
N_g is the sum of the weighted average level of instability
$C_g N_g$ is commodity concentration adjusted for the variation amongst the individual export market instability
I_g is the sum of the covariances in weighted export market instability indices
II_g is the geographic export instability

Again, any negative relationship between export market diversification and export instability value will be weakened due to the presence of N_g and I_g.

3.4 The Data

All export data used are annual gross merchandize exports expressed in domestic currency (f.o.b) on the basis of balance-of-payments accounting. This follows from the argument that what is relevant for domestic producers is the value of receipts in domestic currency (O'Brien,1972)[14]. Annual data are used in the analysis here so as to focus on the longer period disturbances which are more relevant to policy and general economic adjustment. The longer interval period also covers the structural characteristics relating to instability which will not necessarily manifest itself in relatively short periods (Martin,1989). Re-export figures are not deducted here on the basis that the figures for the period under study are small and incomplete prior to 1975. Re-exports remain relatively unchanged at about 5 per cent of gross exports through the 1975-91 period (Department of Statistics,1975,*Annual Statistics of External Trade,Malaysia*;1991, *External Trade Summary,Malaysia*).

For commodity diversification, as noted earlier, each commodity is distinguished using the SITC[15] two-digit commodity classification scheme for practical reasons. It also implies that diversification examined in this section places more emphasis and relative importance on *between-group* diversification as against *within-group* diversification.

For geographic diversification, only major export destinations are considered. These are Western Europe, Eastern Europe, West Asia, East Asia, South-East Asia, Latin America, North America and Oceania.

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[14]Published export values are only a general guide to export receipts as published data may not capture the existence of factors such as bonus schemes and incentives which discriminate among commodities.

[15]SITC groups of 0, 1, 2 and 4 represent the traditional exports which include food and raw materials. Exports of fuel and chemical constitute groups 3 and 5 respectively, while groups 6, 7, and 8 cover manufactures and machinery.

From an analytical viewpoint, export earnings figures in import purchasing power are used for the estimation of the export instability index. Real export values are obtained by dividing their nominal values by their import price indices to obtain purchasing power or capacity to import measures. Martin (1989,p.41) points out that this form of price deflation takes into account the substantial rate of inflation and exchange rate changes. These factors are most likely to occur in the sample period of this study.

3.5 Analysis: Commodity and Geographic Diversification

We make a comparison here between the Gini-Hirschman coefficient as a measure of concentration, which is given by $c = 100\sqrt{\sum_{i=1}^{n}(X_{it}/X_t)^2}$, and the concentration index used in here as given by $c_c = 100\sqrt{C_c} = 100\sqrt{\sum_{i=1}^{n}(\overline{X_{it}}/\overline{X_t})^2}$. The difference between the two is that the Gini-Hirschman coefficient uses actual values of export earnings while the concentration index in our study uses expected values of export earnings. The neoclassical prescription which calls upon the LDCs to specialise in production which enjoy a comparative cost advantage assume that costs and trading opportunities are known with certainty. However, when this assumption is dropped, Soutar (1977) argues that the same prescription to specialise can only apply in terms of expected values of export proceeds. If there are few variations from these expected values and these variations are not costly, then the expected values can be considered by policy makers (Soutar,1977,pp.279-280). Hence, the extent of diversification is judged from the values of c_c in different periods.

In this study, the export instabilty index is defined as U_t, which is the square root of II_c. This is to make the index independent of the units in which the series of export earnings is measured (Moran,1983,p.199).

It was mentioned earlier in Chapter Two that the share of primary commodities in total exports has declined over the 1968-91 period. On the other hand, there has been a rapid rise in the export of manufacturing goods since 1975. In Table 3.1 below, column (1) shows that the commodity concentration index has fallen from 46.1 per cent in 1968 to 28.7 per cent in 1991. The relatively consistent fall in commodity concentration over the period has not, however, been accompanied by a consistent decline in total export earnings instability (see Chart 3.1).

Table 3.1
Commodity: Concentration index and export instability index

Year	(1) Concentration Index (c_c)	(2) Instability Index ($U_t = \sqrt{II_c}$)
1968	46.06	6.79
1969	44.67	12.91
1970	44.44	8.71
1971	42.46	0.84
1972	40.85	20.76
1973	40.15	0.38
1974	40.01	7.28
1975	38.30	18.61
1976	36.96	19.70
1977	36.71	8.33
1978	33.87	4.42
1979	34.97	15.12
1980	35.18	2.42
1981	35.85	9.46
1982	35.97	4.87
1983	36.28	5.92
1984	35.12	14.56
1985	34.43	1.00
1986	33.34	16.43
1987	31.23	5.07
1988	30.25	1.79
1989	29.08	1.73
1990	28.87	3.61
1991	28.72	1.04

Source: Table 3.3

Chart 3.1: Commodity: Concentration and export instability value

Diversification of export markets contrasts sharply with that of export commodities over the past 24 years. First, the geographic concentration index has remained relatively unchanged. The geographic concentration index averages 34 per cent; fluctuating within a range of about 2 percentage points between 1968 and 1991 (see Column(1) Table 3.2). This small variation in the geographic concentration index (see Chart 3.2), indicates that there has been only a slight shift in trade among the export markets. Statistical evidence shows that trade with Singapore, Japan and the United States, alone comprise 52.84 per cent of Malaysia's total exports in 1970 and went up to 55.93 per cent in 1991 (Department of Statistics,1991,*External Trade Summary,Malaysia*). As noted in Chapter Two (p.61), the declining trend in the EEC's share of Malaysia's exports was not very large - a drop of about 5.5 percentage points between 1970 and 1991. On the other hand, an increase in the case of the East Asian NICs[16] by 5.4 percentage points was seen over the same period.

[16]They comprise of Taiwan, Republic of Korea and Hong Kong.

Comparatively, it is found that geographic instability is relatively larger than commodity instability during the relatively turbulent periods in 1972, 1975-76, 1979 and 1986. The index of geographic instability fluctuated from 22.9 to 19.5, to 17.5 and then to 15.0, respectively, while that for commodity exports fluctuated at 20.0, 18.5, 15.0 and 16.0, respectively, over the same period (see Column(2) in Table 3.1 and Table 3.2).

Table 3.2
Export market: Concentration index and export instability index

Year	(1) Concentration Index (C_g)	(2) Instability Index ($S_i = \sqrt{II_g}$)
1968	33.81	2.25
1969	34.11	14.03
1970	35.02	5.48
1971	34.85	3.11
1972	34.45	22.91
1973	33.85	1.38
1974	34.24	11.46
1975	33.82	19.39
1976	33.22	20.58
1977	34.85	5.45
1978	34.70	3.97
1979	34.89	17.57
1980	35.48	2.70
1981	35.33	6.77
1982	35.00	2.09
1983	35.10	5.93
1984	34.90	13.10
1985	35.28	0.58
1986	34.65	15.65
1987	33.54	6.82
1988	33.32	0.37
1989	33.71	0.36
1990	33.95	3.17
1991	34.56	1.42

Source: Table 3.4

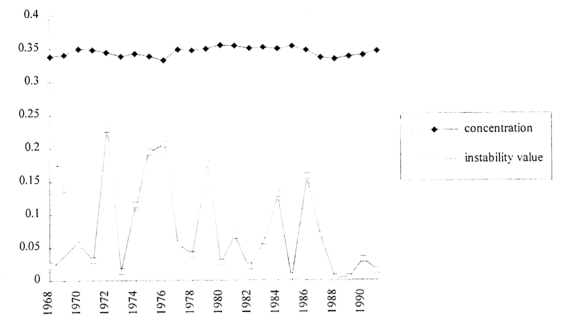

Chart 3.2: Export market: Concentration and export instability value

A priori, it is argued that a fall in export concentration will tend to reduce export instability. Table 3.3 shows clearly that although there is a fall in commodity concentration, C_c, the weighted average level of instability of each commodity (N_c) has fluctuated considerably over the 1968-91 period. The reasons for the fluctuation in N_c may be found in the export earnings instability of individual commodities (this is taken up in Chapter Four). Needless to say, the fluctuations in N_c has affected C_c such that $C_c N_c$ *(commodity concentration, after adjusting for the variation amongst the individual commodity instability)*, has not given rise to a favourable reduction in total export earnings instability. There have only been two periods where a fall in $C_c N_c$ has resulted in a fall in total export instability (II_c) despite a rise in I_c , that is during 1970 and 1989 (Table 3.3).

Table 3.3
Decomposition of Commodity Export Earnings Instability

Year	(1) C_c	(2) N_c	(3) C_cN_c	(4) I_c	(5) II_c	(6) C_cN_c/I_c
1968	0.2121	0.0181	0.0038	0.0008	0.0046	4.9908
1969	0.1995	0.0612	0.0122	0.0045	0.0167	2.7419
1970	0.1975	0.0072	0.0014	0.0061	0.0076	0.2328
1971	0.1802	0.0124	0.0022	-0.0022	0.0001	-1.0323
1972	0.1669	0.0629	0.0105	0.0326	0.0431	0.3222
1973	0.1612	0.0478	0.0077	-0.0077	0.0000	-1.0019
1974	0.1601	0.0208	0.0033	0.0020	0.0053	1.6846
1975	0.1467	0.0928	0.0136	0.0210	0.0346	0.6476
1976	0.1366	0.0487	0.0067	0.0322	0.0388	0.2071
1977	0.1348	0.0233	0.0031	0.0038	0.0069	0.8246
1978	0.1147	0.0272	0.0031	-0.0012	0.0020	-2.6758
1979	0.1223	0.0447	0.0055	0.0174	0.0229	0.3147
1980	0.1238	0.0201	0.0025	-0.0019	0.0006	-1.3071
1981	0.1285	0.0084	0.0011	0.0079	0.0089	0.1374
1982	0.1293	0.0261	0.0034	-0.0010	0.0024	-3.3677
1983	0.1316	0.0062	0.0008	0.0027	0.0035	0.3013
1984	0.1234	0.0519	0.0064	0.0148	0.0212	0.4323
1985	0.1185	0.0130	0.0015	-0.0014	0.0001	-1.0700
1986	0.1112	0.0693	0.0077	0.0193	0.0270	0.4000
1987	0.0976	0.0121	0.0012	0.0014	0.0026	0.8523
1988	0.0915	0.0205	0.0019	-0.0016	0.0003	-1.2077
1989	0.0846	0.0034	0.0003	0.0000	0.0003	18.9385
1990	0.0833	0.0132	0.0011	0.0002	0.0013	5.2195
1991	0.0825	0.0010	0.0001	0.0000	0.0001	3.7431

The above symbols stand for the following:

C_c - the square root of this term denotes the commodity concentration index
N_c - the sum of the weighted average level of instability
C_cN_c - commodity concentration adjusted for the variation amongst the individual commodity instability
I_c - the sum of the covariances in weighted commodity export instability indices
II_c - the square root of this term denotes the commodity export instability index
C_cN_c/I_c - the size of this ratio would reveal the relative contribution of each term to total instability (II_c)

As for the geographic aspect, due to the relatively small change in C_gN_g *(geographic concentration after adjusting for the variation amongst the individual export market instability)*, it is difficult to establish any significant link between concentration and geographic export instability (Table 3.4).

Table 3.4
Decomposition of Geographic Export Earnings Instability

Year	(1) C_g	(2) N_g	(3) $C_g N_g$	(4) I_g	(5) II_g	(6) $C_g N_g / II_g$
1968	0.1143	0.0048	0.0005	0.0000	0.0005	-13.9560
1969	0.1163	0.0267	0.0031	0.0166	0.0197	0.1874
1970	0.1226	0.0073	0.0009	0.0021	0.0030	0.4272
1971	0.1215	0.0075	0.0009	0.0001	0.0010	15.2143
1972	0.1187	0.0526	0.0062	0.0462	0.0525	0.1349
1973	0.1146	0.0151	0.0017	-0.0015	0.0002	-1.1231
1974	0.1172	0.0228	0.0027	0.0105	0.0131	0.2559
1975	0.1144	0.0653	0.0075	0.0301	0.0376	0.2479
1976	0.1103	0.0799	0.0088	0.0336	0.0424	0.2629
1977	0.1215	0.0188	0.0023	0.0007	0.0030	3.3365
1978	0.1204	0.0083	0.0010	0.0006	0.0016	1.7452
1979	0.1217	0.0471	0.0057	0.0251	0.0309	0.2280
1980	0.1259	0.0041	0.0005	0.0002	0.0007	2.3781
1981	0.1248	0.0233	0.0029	0.0017	0.0046	1.7383
1982	0.1225	0.0247	0.0030	-0.0026	0.0004	-1.1698
1983	0.1232	0.0071	0.0009	0.0026	0.0035	0.3302
1984	0.1218	0.0253	0.0031	0.0141	0.0172	0.2186
1985	0.1245	0.0164	0.0020	-0.0020	0.0000	-1.0168
1986	0.1201	0.0364	0.0044	0.0201	0.0245	0.2173
1987	0.1125	0.0061	0.0007	0.0040	0.0047	0.1729
1988	0.1110	0.0057	0.0006	-0.0006	0.0000	-1.0221
1989	0.1136	0.0043	0.0005	-0.0005	0.0000	-1.0257
1990	0.1152	0.0059	0.0007	0.0003	0.0010	2.0500
1991	0.1194	0.0012	0.0001	0.0001	0.0002	2.4710

The above symbols stand for the following:

C_g - the square root of this term denotes the geographic concentration index

N_g - the sum of the weighted average level of instability

$C_g N_g$ - commodity concentration adjusted for the variation amongst the individual export market instability

I_g - the sum of the covariances in weighted export market instability indices

II_g - the square root of this term denotes the geographic export instability index

$C_g N_g / II_g$ - the size of this ratio would reveal the relative contribution of each term to total instability (II_g)

From the model used in this study, the terms I_c and I_g in Column(4) of Tables 3.3 and 3.4, respectively, indicate the *correlations between the movements of different export commodities and export markets* respectively. It is expected that the value I_c *and* I_g , would be large when there are large unison movements among export commodities and

export markets respectively. Table 3.3 shows that the covariances in commodity export instability (I_c) exhibit a larger effect than C_cN_c on total export instability. During the years 1974, 1976, 1981 and 1983, sharp increases in I_c were recorded. These caused the export instability index to rise although there had been favourable reductions in C_cN_c (see Table 3.3).

Tremendous changes in global economic activity have offset the favourable impact of a fall in C_cN_c on total export earnings instability in Malaysia. The disturbances include the occurrences of the oil shocks in 1973 and 1979. Between late 1972 and 1974, there was a cyclical upswing in economic activity spurred by a boom in export prices much of which was associated with the first oil shock. The second oil shock in 1979-80 resulted in restrictive monetary policies being adopted in the industrialised nations aimed at reducing high inflation. Subsequently, this led to a recession in the industrialized nations during the early 1980s. The unexpected deterioration in the international environment brought about slower growth in world trade, depressed commodity prices, reduced access to foreign financing, and gave rise to steep increases in real interest rates (World Bank,1991,*World Development Report*,p.18). The period of abnormally high interest rates sharply increased the costs of holding stocks. Maizel (1987) noted that this has been an additional factor depressing the normal level of stocks held by traders in developed countries, so that a given shift in the imbalance between supply and demand tends to be reflected in greater price variation than previously.

There was a further collapse of commodity prices across the board in 1985/86. Slower growth in industrial countries depressed demand, while changes in technology reduced the demand for industrial raw materials. Growing subsidies in agriculture and trade protection caused over-production in the industrial countries. In the case of the LDCs, Bhaskar (1991) and Gilbert (1987) argued that debt-induced supply shifts were at

least partially responsible for depressed commodity prices[17]. Duncan (1992), on the other hand, argued that the direct cause of the declining price trends throughout 1980s, particularly for perennial crops, was due to continually expanding production in the face of stagnant or slowly growing demand. Improved efficiency in production, reductions in export taxes, depreciation of real exchange rates and growing (efficient) labour force in producing countries were among the factors which led to increased world output in the face of falling real prices of perennial crops.

On the other hand, the whole scenario changed considerably at the end of 1986 with a better balance between supply and demand for non-oil commodities. From mid-1987, there was a small rise in the composite index of real commodity prices (World Bank,1988,*World Development Report*,p.25). The recovery of commodity prices strenghtened Malaysia's trade account. Hence, it is not surprisingly to find high total export instability for commodity exports during the eventful years of the mid-70s, early 80s and mid-80s.

The reversed situation prevailed during 1971 and 1988. A relatively stable world economic environment coupled with a fall in similar movements among export commodities as reflected by the declining and smaller values of I_c during the period, predominated. Prior to the collapse of the Bretton Woods exchange rate system in 1973, strong and stable GDP growth averaging 5.0 per cent was recorded in the industrial countries (World Bank,1988,*World Development Report*,p.13). Favourable economic growth in late 1987 and 1988 were attributable to increased activity in the industrial countries following less regulations and lower taxes[18]. These were combined with falling

[17] It was argued that following the rise of the US dollar and world interest rates, many developing countries faced a sharp rise in debt repayments and were forced to expand export supplies in order to boost export earnings. This rise in export supplies was in part responsible for the fall in commodity prices (see also Dornbusch,1985).

[18] Fiscal and regulatory policies emphasized supply-side incentives; taxes on both household income and business profits were reduced. There were major structural reforms which included privatization of publicly

price of oil in 1986, expansionary monetary policies and greater policy cooperation (World Bank,1991,*World Development Report*,pp.18-19). The impact of favourable external influences has been substantial leading to a fall in total export earnings instability to fall despite a rise in C_cN_c in 1971 and 1988 for the Malaysian export commodities. The above observations suggest that world economic performance exerts considerable influence on the exports of Malaysia during the 1968-91 period.

Similar influences of the global economic environment on commodity diversification are also found in terms of geographic diversification. Although there is an increase in C_gN_g *(geographic concentration after adjusting for the variation amongst individual export markets instability)* in 1971, the stable export market environment among countries during the period contributed to a fall in total export instability in Malaysia. However, during 1983, despite a fall in C_gN_g, the large increase in I_g *(correlations between the movements of different export markets)* adversely affected total export earnings instability in Malaysia. This is partly attributable to widespread instability in foreign demand for primary products from the Western industrialised nations following from the second OPEC oil price rise.

Table 3.5 illustrates the close relationship between *I* and total export instability index, *II,* during the 1968-91 period. The correlation coefficients (*r)* between *I* and export instability is not only high but it also appears to be larger than between *CN* and export instability for both commodity and geographic diversification.

owned enterprises and the liberalization of product, labour and financial markets (World Development Report,1991,p.19).

Table 3.5
Relationship between: (a) export instability and commodity/geographic concentration adjusted for the variation amongst the individual export commodity/export market instability and; (b) export instability and covariances among commodities/export markets

Commodity			Geographic		
	I_c	C_cN_c		I_g	C_gN_g
II_c	r=0.9740147	r=0.7634910	II_g	r=0.9974161	r=9142436

With *I* being the dominant contributor to export instability, this study shows that global economic conditions have important influence on the nation's export earnings. The one-to-one relationship between concentration per se *(c)* and the instability indices *(II)* for the Malaysian case during the 1968-91 period was less obvious. As noted in Chapter Two, statistical evidence shows that the expansion of Malaysian manufactured goods is considerably concentrated on textiles, electronic and electrical appliances. Further, there have not been any significant new large export markets that Malaysia has managed to penetrate over the past twenty years. The narrowly based manufacturing exports and export markets means that Malaysia is still largely exposed to and affected by foreign demand vagaries for the commodities and of the few export markets.

3.6 Conclusion

Values of export instability from previous studies and the values of export instability computed in this study are not directly comparable although commodity concentration is the key consideration. There are differences in the methods used for calculating the instability index and the time period studied in which computations are made.

In reviewing how *effective* commodity and geographic diversification programmes have been for the past two-and-a-half decades, the findings reveal that commodity export concentration has declined by about 17 percentage points between 1968 and 1991. This reduction, resulting from large extent in diversification policies, has not been accompanied by a systematic decline in export instability.

Efforts to broaden the markets for Malaysia's exports have been, on the other hand, limited. The degree of geographic concentration has remained relatively unchanged averaging 34 per cent over the 1968-91 period. High geographic concentration has persisted along side large fluctuations in export earnings during the period under review. Preferential markets for the Malaysian exports are still largely determined by institutional and political factors. Institutional and political factors which include trade preferences, bilateral trading agreements and impediments to free multilateral trade make the different markets, particularly the newer (mainly LDC) markets, imperfect substitutes for the older (mainly DC) markets.

The argument for diversification rests largely on a negative correlation between earnings from exports of different commodities or markets which is indicated by small or negative values of I (see Kumar Das and Pant,1989,p.68). From Column (6) in Tables 3.3 and 3.4, it is found that the ratio of CN to I tends to be larger for commodity diversification than geographic diversification. This indicates that the values of I_c for commodity diversification has been comparatively smaller than I_g for geographic diversification. Commodity diversification appears to be more *effective* in lowering export instability than geographic diversification during the 1968-91 period.

It is obvious that Malaysia cannot insulate itself substantially from turbulances in international markets for its principal exports. The export sector remains vulnerable to adversed developments in the international economy during the period under review.

Commodity interrelationships and intercountry relationships appear to exert strong and significant effects on export instability.