

The Causes and Structures of Export Earnings Instability In Kenya

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This research paper has been submitted for examination with our approval as University supervisors.

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CHAPTER ONE

INTRODUCTION.

1.0 Background.

Issues concerning commodity stabilization dominated international forums in the 1960s and 1970s. The issues were largely raised by less developed countries out of growing dissatisfaction with the existing world economic order of the time. The dissatisfaction arose from the concern that, third world countries, the majority of whom were primary product exporters, did not stand to reap sufficient benefits from trade.

Junz and MacAvoy (1978) emphasize two major trends in the international trade that were responsible for third world unified concern. First, was the concern for deteriorating terms of trade. Here, the prices of third world exports, mainly primary products, were drastically falling relative to their imports, mainly manufactured products. Secondly, there was concern over increasing export earnings fluctuation. It was widely conceived that erratic pattern of export earnings was detrimental to planning and overall growth of the economy.

This study will focus on the export earnings instability. It will specifically address the causes of export earnings instability.

1.1 The Concept of Export Instability.

The term export instability is frequently used to imply export earnings instability. Earnings constitute the product of prices and quantities which in turn are determined by changes in supply and demand.

Fluctuations in earnings can be short term (year to year) or long term (trend). Short term fluctuation can further be cyclical, seasonal or irregular.

The concept of export instability focuses on the short term (year to year) fluctuations in earnings as opposed to long term (periodical) trend. The short term fluctuations (instability) are measured around a particular chosen trend. The rationale for this is that, exports generally grow over time, and if absolute values are taken to represent instability then preceding years will indicate lower instability indices than recent years. To avoid this, a practice of de-trending is used. A trend is chosen to indicate the desired growth path in export earnings, free of instability and any deviations from this trend constitutes instability measures.

However, great caution is needed in interpreting short term fluctuations. Not any form of short term fluctuation constitute instability; only irregular and non-predictable fluctuations make up instability in earnings. As Coppock (1977) argues that "trade instability should not be understood to mean any deviations from a fixed level. It means 'excessive' departure from some 'normal' level".

This concept can be illustrated further by use of the following figures:

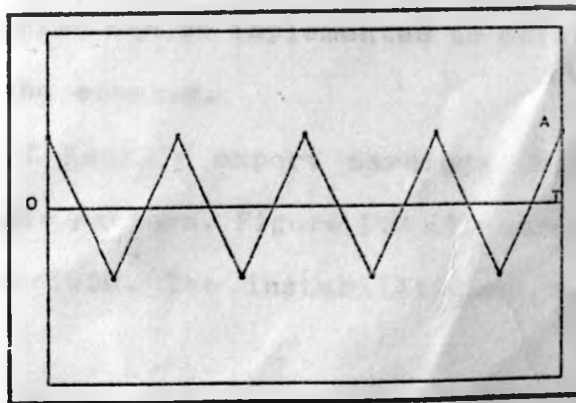


Fig. (1.1)

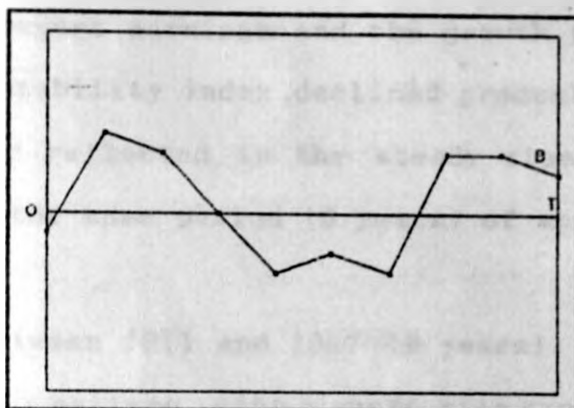


Fig.(1.2)

Source: Homi Katrak, JDS:Vol.9 (1973)

Where,

OT = is the trend in export earnings.

OA,OB = deviations from the trend line.

In figures (1.1) and (1.2) above, OA and OB are the patterns of export earnings. Figure (1.2) shows systematic and regularly reversing pattern of fluctuations. Figure (1.2) has no systematic pattern; it is not predictable and is therefore uncertain. It is this kind of fluctuation that forms the realm of export earning instability. Figure (1.1) can be relatively predicted and stabilization policies can be implemented to offset the possible repercussions on the economy.

The pattern of Kenya's export earnings to a large extent displays and unstable pattern. Figure 1.3 illustrates this, based on the period 1963-1990. The instability was measured as the

annual percentage change from the ordinary least squares fitted trend. Movement in instability index can be related to rate of growth of real export earnings and the growth period. From the diagram, the instability index declined gradually from 1963 up to 1970. This is reflected in the steady rise in real export earnings within the same period (6 years) of approximately 6.5% (See table 1.2).

However, between 1971 and 1987 (6 years), the index shows quite an irregular pattern, with a sharp rise experienced between 1971 and 1977. This is again reflected in the pattern of export earnings where there was a rise in real earnings of 313.2% between the same period. This growth rate compared with that experienced between 1973 and 1975 (2 years) of 10.8% reflects excessive positive fluctuation. The growth is attributed to the coffee boom of the early 70s.

After 1977, another period of sporadic pattern begun. There was a sharp decline in instability between 1977 and 1978 reflected in real growth rate in real export earnings of -11.13%. This was followed by a rise in the index between 1978 and 1980 which was proceeded by tremendous decline in the index between 1980 and 1982. The growth of real export was -34.4%. There was a short decline in instability between 1982 and 1985. This was marked by growth in export earnings of approximately 11.7%. The pattern displayed by the diagram therefore clearly show that instability in export earnings is a feature of Kenyan export trade, manifested by the great variations in export earnings growth.

Instability is a major bottleneck to effective planning and

consistent growth. Wallich (1961), as quoted in Huynh and Athukorala (1987 page 12) points out that "instability turn programming at best a guessing game, into a rank speculation ... it moulds the economic climate, infuses uncertainty into plans, and narrows the investment horizon. Economic development is the victim".

Brainard and Cooper (1968) divide the impact of earning uncertainty into welfare and growth effects. Welfare effects include the loss or gain in the incomes and wages of export producers and hired labour respectively. In addition, all agents involved in the distribution processing and marketing of exportable will stand to gain from a rise in earnings and will lose income drastically when export earnings drop. In turn, this affects their planned expenditures, savings and consumptions.

Inflationary tendencies also arise following earnings instability. This occurs out of a "ratchet effect" process in consumption. When there is a rise in export earnings, agents incomes rise accordingly, this leads to a rise in consumption spending. However, when this is proceeded by a fall in incomes agents will attempt to sustain their previously attained consumption status. However, in sectors like agriculture and housing, supply is inelastic in the short run leading to price rises.

The impact of export instability on growth arises mainly when the production sector depends on imported inputs. This could either be in terms of machinery or other intermediate inputs. A short fall in earnings which leads to reductions in imports would ultimately have a bearing on output and sustained capacity

utilization.

On the other hand government expenditure is likely to shift in accordance with revenues derived from taxation of exports. In the event of an instant shortfall in export earnings, the ability of the government to finance capital expenditure (i.e. capital formation) is curtailed. Conversely, when there is a rise in export earnings the government spending power is boosted. This behaviour amounts to 'stop-go' investment pattern that in turn affect production and employment accordingly.

Extra costs are further incurred in form of real resource cost in terms of inventories and storage facilities. This happens when the government attempts to avert foreseen and unforeseen changes in earnings by holding large reserves of foreign assets and buffer stocks. The economic cost here comprise the foregone spending on currently desirable development projects.

Finally, the most dreaded effect of export earnings instability is its relationship with debts. During the periods of excessive short falls in export earnings, governments attempt to bridge planned earnings and actual earnings mostly by external borrowing when domestic borrowing is already tight.

On the other hand, during periods of excessive rise in export earnings, the government is expected to service much of her debts besides initiating more long term projects. This nevertheless, should be done more cautiously with correct macroeconomic policies to avoid the economy being faced with excessive liquidity.

Existing empirical knowledge on the impact of export instability is however controversial. Much of the work has been

undertaken on cross-country basis. MacBean (1966) and Coppock (1962) provide two major pioneering work that strongly contrasted the conventional view of the possible effects of export instability on the growth and development of third world economies. These two pioneering researchers argue that there is no prima facie evidence that export instability is a critical problem in developing countries.

The two studies and others¹ which have followed similar methodology have been criticised on the choice of cross-sectional data and other methodological weaknesses². Recent studies have found strong effects of export instability on developing economies. They include Massell (1970), Glezakos (1973), Naya (1973) and Athukorala (1987).

A study conducted by Love (1973) established that the major products³ accounted for 33% and 28% of Kenya's total instability while the major⁴ markets contributed 15% and 11% of total instability between 1961 and 1971. Nyambati (1980) found that export instability had a positive and significant effects on gross investment and Gross Domestic Product.

There are two approaches towards stabilizing export earnings. The first is to directly stabilize absolute earnings

¹ I.E MacBean (1966) and Kenen and Voivodas (1972).

² 1. Failure to allow for time lags on the possible effects in the economy.

2. Failure to design a general macro-econometric model that links the export sector and domestic economy

³ Major in terms of their proportion value in total export earnings.

⁴ Major in terms of the total value of exports destined to those markets.

and the second is to stabilize either prices or volumes which in turn will stabilize earnings. Stabilizing prices or volumes will indirectly stabilize overall earnings. The first approach is mainly done by international compensatory organizations.

Traditional micro economic theory shows that prices and quantities are determined by shifts in export demand and export supply. If the supply of a product is price elastic, quantities tend to be relatively more unstable. Conversely, if supply is inelastic, prices tend to be more unstable than quantities.

On the other hand, if demand for a product is price elastic earnings variations arise from volume variations; while if demand is price inelastic, earnings fluctuation will approximate price fluctuation.

From these illustrations, earnings instability is linked to supply and demand shifts, which underlie changes in prices and quantities. It becomes important then to understand the causes of earnings instability from the demand and supply shifts. Knowledge of price and quantity changes is not sufficient to formulate policies on reducing export earnings instability. For example, attempts to stabilize prices whose changes have been brought about by changes in supply will have a quantity change which will be offset the impact on earnings. When prices are adjusted upwards, quantity demanded falls whereas when prices are adjusted downwards quantity supplied falls.

On the other hand, stabilizing prices whose changes have come about as a result of demand changes, will eventually stabilize earnings. This is because quantity response will reinforce the changes in price; that is quantities supplied will

rise following price rises and will fall when prices fall.

It follows from above that demand and supply factors are crucial in any analysis of export earnings instability. For empirical studies this approach will offer an opportunity to isolate the determinants of earnings instability. It will also provide useful information for policy on commodity stabilization.

Supply instability, mostly experienced by primary products, is due to cobweb expectations effect and to supply fluctuations brought about by weather variability. Distinction is sometimes drawn between raw materials and foods in terms of their income elasticities. Foods have lower income elasticity than raw materials and therefore have stable earnings.

Shifts in demand constitute another set of explanatory variables. These shifts are due to changes in the prices of substitutes or complementary products, variations in the level of economic activity in importing countries or monetary and exchange rate changes. These factors could lead to speculative buying and stock holding.

Changes in domestic consumption of exportable commodities affect supply directly. These changes are due to factors such as changes in domestic monetary and fiscal policies which affect consumption levels of these commodities and ultimately export volumes.

A country's share of the world market also affects instability. When a country commands a high market share in the commodities it trades in, it faces almost the entire market demand curve which is less elastic. Where a country's market share is very low, it faces a more elastic demand curve. In this

latter situation supply changes will result in wide dispersion in export earnings.

Export instability also stems from commodity and market concentration. Technically, commodity concentration implies low diversification. This results in instability in the sense that the few commodities are prone to risks which could arise from drought, floods or recession in the consuming countries. This view is analogous to market concentration where it is believed that the larger the spread of exports over several markets the more stable the earnings.

1.2 Commodity Stabilization Programmes.

Attempts have been made at both international and national level to address the problem of export earnings instability.

The issue was addressed at the global level, by United Nations Conference on Trade and Development (UNCTAD IV) in 1976. In this conference three major objectives were proposed inter-alia,

- to avoid excessive price fluctuation;
- sustain real income of individual developing countries and
- to diversify production in developing countries including food production.

To achieve these objectives an integrated programme for commodities (IPC) was launched. The programme initially covered ten so called 'core' commodities (coffee, cotton, sugar, tea, copper, cocoa, hard fibres, jute, rubber and tin). The IPC involved two major commodity schemes, the buffer stock and supply

management. The former was meant to cushion against excessive price fluctuation while the latter was to allocate quotas or market shares to member producers.

Commodity agreements have however not lived to their expectations in the past years. Both economic and non-economic reasons have contributed to this. Key among the reasons has been the frequent disputes arising from market share allocations, overshipping, entry and disputes between importing and exporting nations⁵. Further, the "free zones" where supply is non restricted for members and non members has been the centre of controversy. Prices prevailing in these markets are much lower than those of the controlled markets. As a result a tendency emerged where countries purchased stocks from the "free zones" and re-exported into the controlled zones; this had the effect of suppressing controlled prices.

Apart from the attempts by UNCTAD, the European Economic Community (EEC) operates a stabilization scheme for loss of export earnings (stabex) of African, Caribbean and Pacific (ACP-EEC) countries⁶. Table 1.1 shows Kenya's compensation profile since the scheme started. The exports covered are only those destined to EEC trading bloc and those transacted between ACP states.

The International Monetary Funds (IMF) also runs a related scheme known as IMF compensatory Financing scheme. This scheme considers a country's overall balance of payments unlike the commodity approach of EEC. The IMF scheme also gives loans with

⁵ See Adams and Klein page 200

⁶ See Lome (iv) Convention (1990) March-April

interest as opposed to EEC funds which do not bear any interest. The poorest countries are further exempted from repaying principal amount under the EEC financing scheme.

Table 1.1

Kenya's Compensation Receipts From STABEX In ECU.

YEARS	Millions (ECU)
1980	10.1
1981	16.5
1985	13.8
1987	70.7
1988	19.1
1989	11.1

Source: Courier 1992.

1.3 Research Problem.

Earnings instability has received much attention from international bodies, regional organizations and scholars. Consequently attempts have been made to address this problem both at international and national level.

However, in view of the limitations of price stabilization through buffer stock schemes coupled with the problems crippling the commodity organizations; third world countries are increasingly becoming pessimistic over the capability of commodity organizations to stabilize export earnings. In addition, given that the IMF compensatory financing scheme bears a cost in terms of debt servicing, it becomes imperative for third world countries to explore the deeper roots of export earnings instability.

In attempting to answer these questions, the concern is to try and solve instability problems within the policy reach of these countries. Kenya being one of the countries facing export earnings instability problem can equally exploit the scope of these remedial measures.

In Kenya no empirical study exists to show clearly the causes of export earnings instability. There is also no study showing explicitly the relative contribution of various export commodities and markets towards instability in earnings.

This study will therefore seek to investigate the causes of export instability in Kenya and the contribution of key selected export products and market outlets towards instability.

1.4 Objectives Of The Study

The objectives of this study are:

- to formulate and estimate a model of export earnings instability for Kenya,
- to evaluate the share of export earnings instability accounted for by key selected export products, and market destinations; and
- to make policy recommendations on the basis of the results obtained.

CHAPTER TWO

LITERATURE REVIEW.

Several studies have been conducted on export earnings instability. Athukorala and Huynh (1987) divide these studies into two categories. The first group focuses on the impact of export instability on economic development while the second is concerned with the causes of export instability. This chapter gives a critical look at past studies focusing on the causes of export instability. However, a study on the impact of export earnings instability in Kenya will be briefly discussed.

Nyambati (1980), analysed the impact of trade instability on economic growth in Kenya. The study specifically, examined the correlation between export earnings instability and other economic variables namely, trade gap instability, investment, GDP and changes in capital stock⁷. In this study the mean deviation of the detrended data was used as the index of instability. However, the data was not actually detrended.

The study showed that trade gap instability was positively correlated to investment and was significant at 5%, the Spearman Rank Order Correlation (SROC) was 0.714. Export instability had a positive but weak relationship with changes in stocks, the SROC value was 0.099. Gross Domestic Product was positively correlated with export instability, the SROC was 0.755 after lags were introduced. These findings suggest that the impact of export earnings instability in Kenya can not be overlooked.

The following are studies that have focused on the causes

⁷ He defined stock as gross investment-gross fixed capital formation.

of export earnings instability. Apart from studies by Athukorala and Huynh (1987) and Lee (1977) which focussed on Sri-Lanka and Malaysia respectively, the rest of the studies are cross sectional.

† Coppock (1977), covered 109 countries and the period between 1959 and 1971. The study conducted a broad analysis of how various independent variables were related to export instability and the contribution of various countries to world export instability. The study measured instability as the average of percentage deviations of the actual values from the trend values. That is,

$$\sum_{t=1}^n [(Y_t - Y_{t-1}) / Y_t] / N \times 100 \dots \dots 2.1$$

where,

Y_t = Actual value of export earnings in year t.

Y'_t = Estimated value of export value.

n = Total number of years

This method was suitable for the study because it provided a summary index for the period under study. The method is also simple and isolates the trend to avoid biases in the index. Coppock regressed export instability against 8 variables namely; export price instability, instability of foreign trade as a percentage of GDP, growth rate of export value, growth rate of export price index, growth rate of import value, goods imports as a percentage of total imports and average net balance of payment as a percentage of average imports. The coefficient of determination (R^2) was 0.610 and all the coefficients were

significant at 10%. The level of significance rose to 5% and R^2 also rose to 0.673 with an addition of 3 more variables, import price instability, growth rate of import price index and percentage of agriculture in GDP. The methodology of the study involved elimination of insignificant variables from a list of 38 variables.

The second stage of Coppock's analysis was the contribution of various countries to world trade instability. This was measured as was an index of a country's percentage of world exports weighted by its export instability index. This index is given as:

$$CP = [(IDX)_j / \sum (IDX)_j (R)_j] \times 100 \dots 2.2$$

where,

- CP = Contribution percentage
 IDX_j = Each country's export instability
 R_j = Value of each country's exports

The results of the study showed that West Germany was leading with 11.5% followed by United Kingdom (7.5), United States (7.1), Japan (6.6), France (4.3), Netherlands (4.2), Libya (3.3), Italy (2.6) and Belgium (2.1). These nine countries contributed 50% of total world export instability relative to 58% of their total world exports.

MacBean (1966) conducted a cross country study that sought to examine the causes of export instability. His sample size of 38 was selected from Latin America, North America, Europe, Africa and Asia. He measured instability using two indices. The first was the average percentage deviation of the dollar value of

export proceeds from a 5 year moving average. This was given as:

$$I_x = (100/n-4) \sum_{t=3}^{n-2} [|X_t - MA_t|] / MA_t \dots\dots 2.3$$

where,

- I_x = Instability index
 X_t = Value of exports earnings
 MA_t = Moving Average
 n = Total number of years

The second index was Coppock's index of the antilog of the square root of the logarithmic variance of the data series given as:

$$I_x = \text{Antilog}(1/N-1) \sqrt{\sum \log(Y_t/Y_{t-1}) - \log(Y_t/Y_{t-1})} \dots\dots 2.4$$

where,

- N = Number of years.
 Y_t = Value of export earnings in year t.
 I_x = Value export earnings instability.

Using the percentage deviation index, MacBean's findings showed that the variable for primary product ratio had a positive relationship with export instability of 0.007. Commodity concentration was positively related to instability with a marginal magnitude of 0.011. Geographical concentration was however, negatively related to instability meaning that the more countries diversified their export markets, the more instability was experienced. Non of the above three variables was significant

at 10% level and the R^2 was very low at 0.051. This implies that the function did not explain instability to any reasonable extent. Some relevant variables must have been omitted giving rise to mixed signs of the coefficients of the variables.

Massell (1970), undertook a cross sectional study of 36 less developed countries and 19 developed countries. He defined export instability as the standard deviation of the residuals from the trend. The index was given as:

$$U_{kt} = \log(X_{kt}) - (a_k + b_{kt}) \dots\dots 2.5$$

where,

U_{kt} = Observed residuals

X = Value of exports.

t = Time

a & b = Constants

Using linear model, this index was regressed against commodity concentration, food ratio, raw material ratio, domestic consumption ratio, export market share, income per capita, value of merchandise export and the dummies for LDCs and DCs. The coefficient for commodity concentration showed a positive and significant coefficient at 5% level. Food ratio was also significant but with a negative sign. All the other variables, raw material ratio, domestic consumption ratio, export market share, income per capita, value of merchandise export and the dummies for LDCs and DCs were all insignificant. These findings implied that commodity diversification was an effective measure to curb instability in export earnings. Increased exports of food on the other hand would increase instability. This is contrary to theoretical expectation that food products face inelastic

income demand and therefore income changes in the consuming countries would not immediately affect demand for food products.

Massell attempted to rationalize his cross country study on the basis that data for most Less Developed Countries are lacking although he acknowledges that specific country analysis is crucial. He also uses an exponential trend on the justification that country planning concerns itself mostly with growth rate and not absolute increments. The choice of this trend assumes that the selected exponential trend fits time series data of all the countries in the sample. This is inaccurate especially when his sample comprised a host of developed and underdeveloped countries.

✓ Seiji Naya (1973) undertook a cross sectional study of 17 Asian countries. He defined instability as the standard deviation of the "errors". Using econometric analysis, he examined the effects of food ratio, raw material ratio, geographical concentration, commodity concentration, intra-regional export ratio and total export on export earnings instability.

Only total export and intra-regional variables had significant coefficients with negative and positive signs respectively. The coefficient of geographical concentration was negative and that of commodity concentration was positive. Primary product ratio was positive but the coefficient was insignificant. When these three variables, primary product ratio, geographical concentration and commodity concentration were regressed against instability the R^2 declined to 0.324. Their insignificance together with low values of R^2 implies that commodity diversification, market diversification and

specialization in primary products had no relevance to instability in this region.

The significance of total export and the negative sign of its coefficient implies that a rise in market share could lower instability in earnings. This means that the region would be faced with a less elastic market demand curve hence changes in supply would not result in extreme changes in earnings as would otherwise be the case with a perfect elastic demand curve. The positive sign and significance of intra-regional exports coefficient implies that regional cooperation in trade was a detrimental force to stabilization of export earnings.

Idachaba (1974), did a cross sectional study on 27 African countries. Using econometric analysis, he analyzed the effects of commodity concentration, geographical concentration, food ratio and primary product ratio (excluding food) on export earning instability. He used the trend corrected coefficient of variation as the index of instability. The coefficient of commodity concentration index was found to be positive and significant at 10%. The same result was found for geographical concentration. This implied that diversification of export products and markets resulted in stable earnings.

Food coefficient was negative and insignificant while that of the ratio of primary products was negative and significant at 5% level. The sign of the primary products coefficient did not conform to the theoretical expectation that primary products contribute more to instability in export earnings.

Scutar (1977) undertook a cross sectional study of 48 countries in Latin America, Africa, Asia, Middle East and Eastern

Europe. He analyzed the effects of commodity concentration, geographical concentration, and petroleum products on export earning instability using log linear econometric relationship. He measured geographical and commodity concentration indices using the entropy coefficient given as:

$$H = -\sum_{i=1}^n \log(P_i) \dots\dots 2.6$$

where,

P_i = Proportion of exports from industry i .

H = Entropy coefficient.

He however, did not explain how he classified industrial exports in all the 18 countries. He chose this index and not the Gini-Hirschman coefficient given as:

$$GHC = \sum ([X_i/X]^2)^{1/2} \dots\dots 2.7$$

Where,

GHC = Gini-Hirschman coefficient.

X_i = Annual export earnings from commodity i .

X = Value of total export earnings per annum.

This equation gives a single year data value and that previous researchers who used this index had a tendency to use the "mid year of the period under investigation" as a representative year. The results showed that the coefficient of geographical concentration and commodity concentration were positive and significant at 5% level. This implied that both

diversification of export products and markets could stabilize export earnings. Export instability was negatively related to petroleum products, hence, exports of petroleum products induced more instability in export earnings.

Hong Kiong Lee (1977) studied the case of Malaysia using econometric analysis. His findings revealed that commodity concentration coefficient was positive and significant at 5% level implying diversification by commodity was an effective way of eradicating earning instability. Geographical concentration index was found to be negative and significant at 5%, implying export diversification by country was inimical to export earning stability.

The world market share coefficient was positive and significant at 5% level. The implication is that instability in export earnings largely arose from supply shifts. This is not surprising given that between 1960-73, the time covered by the study, primary product accounted for 85% of total export earnings. These were mainly natural rubber, tin, timber and palm oil⁸. The ratio of manufactured and primary exports were significant and conformed to the theoretical expectations. This implied that the growth of manufactured products contributed to stability in export earnings.

Athukorala and Huynh (1987) conducted a study in Sri-Lanka. They estimated a model of export instability with only 2 explanatory variables, commodity concentration and geographical concentration indices. Instability was defined as absolute percentage deviation of each years exports from a 5 year moving

⁸ JDE 1977, page 320.

average. The coefficient of commodity concentration was significant but negative contrary to the theoretical expectation. The coefficient of geographical concentration was negative and insignificant. The implication of these findings are that diversification of export products does reduce instability of overall export earnings. The sign of geographical concentration was negative implying that diversification of export markets reduces export earnings instability.

The study also examined which of the 3 products tea, rubber, and coconut products was associated with high instabilities. The study found that tea exports contributed less to total export instability despite having the largest ratio in the total export value. The contribution share was 0.61. Rubber, the third largest export product by value had the second least contribution ratio of 1.07. Finally, coconut contributed 1.31, the highest among the three products. This order was similar for the two periods under study 1950-79 and 1955-72. The 'contribution' index used by this study was adopted from Coppock's (1972) study of 'contribution' by country's to total global instability⁹. This index, shows the marginal contributions to total instability per share. A value higher than 1 therefore means that if the share of that product is raised in the total export basket by 1%, absolute export instability rises by a higher proportion. The index is given as:

$$CP = [(IDX)_j R_j / \sum_{j=1}^n (IDX)_j R_j] \times 100 \dots 2.8$$

Where,

⁹ Coppock 1972, page 32.

R_j = Mean percentage share of each commodity in the export mix.

CP = Contribution percentage.

IDX_j = Commodity instability index.

Finally, the study looked at the contribution of various market destinations to total instability. Between 1950-79 and 1950-72, Within these two periods, South African market was the least contributor to Sri-Lanka's total export earnings instability. It was followed by New Zealand between 1955-72, UK (1950-79), and Canada (1950-79).

From the studies reviewed several conclusions can be made. Firstly, the data employed in most studies covered the period when most countries particularly in Africa had not gained independence. Following independence, new developments in crop diversification were introduced. In addition, contrary to the imperialist market restriction to the colonial mother country, new trading partners were established. It is reasonable to expect that these new developments have changed much of the structural findings of these studies; rendering their policy content outdated. It is therefore important to examine the concept of instability a new, especially by employing more updated data.

Furthermore, these studies appear to have dwelt on cross country comparison and in some studies like those of Massell and MacBean, countries from the third world were grouped together with developed countries. Several assumptions were made that include, a common trend estimation, implying that both developed and developing countries experienced an equal growth rate in exports. This assumption demonstrates gross generalization across

countries and raises questions on the credibility of their findings for policy formulation in individual countries. In addition, almost all cross-sectional studies bear a technical weakness in their computation of the degree of concentration, be it geographical or commodity. The use of Gini-Hirschman coefficient given as:

$$C = [(Y_i)^2]^{1/2} \dots \dots 2.9$$

where

Y_i = proportion of export commodity earnings to total exports,

gives the concentration index in one year. As mentioned earlier, previous studies that have adopted this index have tended to use a single years data calculated from the mid-year of the period under investigation. This practice has no justification. It ignores other years which could generate different results.

The support for country case studies is best highlighted by Steven (1989) who points out that "Africa, Caribbean and Pacific comprises of diverse group of states. This diversity extends beyond wide differences in the level of economic development and embraces geographical location, language and culture hence, no small group of case studies can be representative of the group as a whole". From the forgoing, it becomes relevant to conduct a case study tailored on Kenya's structural set-up in order to generate sound and meaningful information for policy formulation.

CHAPTER THREE

METHODOLOGY

3.0. Introduction.

This chapter provides the approaches through which the research problems will be examined. The first problem is an attempt to explain the causes of export earnings instability in Kenya. The second problem is to assess the contribution of 12 selected commodities and 11 market outlets towards total export earnings instability. The first problem, will be analyzed using regression analysis. The general form of the equation will be:

$$I_x = f(\beta_1 F_r, \beta_2 R_r, \beta_3 C_c, \beta_4 G_c, \beta_5 Z, \beta_6 E_r, \beta_7 C_r, e_i) \dots \dots \dots 3.1$$

Where,

- F_r = Food ratio
- R_r = Raw material ratio
- Z = Market share
- C_c = Commodity concentration
- G_c = Geographical concentration
- E_r = Real Exchange Rate
- C_r = Consumption ratio
- e_i = Error term

To explain instability attributable to various markets¹⁰ and commodities¹¹, we will adopt a statistical framework of

¹⁰ UK, Uganda, Sweden, Germany, Pakistan, USA, Canada, Netherlands, Belgium, France and Italy, Burundi, Rwanda, India, Japan.

¹¹ Coffee, tea, petroleum products, hides and skins, cement, soda ash, pyrethrum, sisal maize, fruits and vegetables and meat and meat products.

analysis.

The study will estimate several instability indices. These indices will represent the following variables, instability, concentration levels and market shares.

3:1 Indices of Instability.

The proceeding paragraphs, give a critique of various indices that have been used in previous studies to measure the above variables. These indices are: the average year to year percentage change, the coefficient of variation, the percentage change in export earnings and the 'corrected' coefficient of variation.

The average year to year percentage change in export earnings is given as:

$$I_x = \left[\sum_{t=1}^n (X_t - X_{t-1}) + X_t \right] + N \times 100 \dots \dots \dots 3.2$$

where,

- I_x = Instability index
- X_t = Export earnings
- t = Time period
- N = Number of observations

This index defines instability as the average of the total annual percentage change in export earnings. The index gives a single value of instability for a given time period. It is therefore mostly used in cross-sectional studies. This method does not correct for the trend and tends to have an upward bias when export growth rate is high. It is however, very simple to

compute.

The coefficient of variation (C.V) is given as:

$$C.V. = [a/X] \times 100 \dots \dots \dots 3.3$$

where,

a = Standard deviation

x = Average value of export earnings

This index defines export earnings instability as the ratio of standard deviation to mean export earnings multiplied by 100. This measure is also widely used in cross-country studies. Specifically, it is used to measure the degree of instability in export earnings between countries and between given time periods. This index also does not correct for trend and is limited to non-trended data series.

The percentage change in export earnings is given as:

$$I_x = ([(X_t - X'_t) / X'_t] \times 100) / N \dots \dots \dots 3.4$$

where,

X_t = Export earnings in year t.

X'_t = Estimated trend value of export earnings

I_x = Instability index.

N = Number of observation.

This index describes instability as the mean percentage deviation of export earnings from an estimated (using trend) value. The index eliminates the trend, by measuring the percentage changes around a particular trend.

The 'corrected' coefficient of variation is given as:

$$I_x = C.V. (1-R^2) \dots\dots 3.5$$

The use of this index is restricted when R^2 is greater than zero. Like the coefficient of variation, this index measures instability for the given period under investigation. It is therefore also restricted to cross-country analysis.

This study will adopt the percentage change in export earnings around a particular trend. This method will give an instability index for each year. The choice of this index is justified on several grounds. First, it eliminates the trend and therefore any biases that could arise from the nature of the data. Secondly, given that this is a case study for Kenya that will involve an econometric estimation of time series data, the index will be able to provide instability indices for each year within the considered time period (1963-1990). Other indices would give a summary value for the whole period and would therefore be suitable only for cross sectional analysis.

Two major indices have been widely used to measure commodity and geographical concentration. The first is Gini-Hirschman coefficient (GHC) given as:

$$GHC = [\sum_{i=1}^N (X_i/X)^2]^{1/2} \dots\dots\dots 3.6$$

The second measure is the entropy coefficient given as:

x_i , represents the proportion of export commodity earnings in

$$EC = -\sum_{i=1}^n P_i (\log P_i) \dots \dots \dots 3.7$$

the case of commodity concentration and sales to a specific market in the case of geographical concentration. X refers to value of total exports. P_i represents the proportion of export earnings from industry i in the case of commodity concentration and proportion of sales to market i in the case of geographical concentration.

The entropy coefficient is always non-negative with minimum the value being 0. The minimum value occurs when there is minimum diversification. This occurs when all exports are sold to one market, giving the P ratio value as 1, whose log then is 0.

Conversely, the coefficient (entropy coefficient) increases with diversification, that is, when relative export shares to various markets tend to equal. To demonstrate this concept, let there be four markets. If there is minimum concentration implying greater market diversification, each of the market will have a quarter of the total market share. The entropy coefficient will be:

$$\sum_{i=1}^4 1/4 \log(1/4) = 0.602 \dots \dots \dots 3.8$$

This index is best suited in an economy with an elaborate industrial set-up, unlike the case of Kenya, whose exports are largely agricultural.

The Gini-Hirschman coefficient, on the other hand, has extreme values such as 1 when there is least diversification and $(1/n)^{1/2}$ when diversification is highest. Here n is the number of

commodities or markets. The greater the diversification of exports the lesser the concentration and the lower this ratio. The index therefore varies inversely with diversification. In the previous example, when there is neither market nor commodity diversification, the GHC would be:

$$C_c = [\sum_{i=1}^4 (1/4)^2]^{1/2} = (1/4)^{1/2} \dots \dots \dots 3.9$$

The only limitation with the use of this index is that it varies with n, which in turn depends on commodity classification. The higher the commodity classification, the lower will be the coefficient and vice-versa. This study will use the Gini-Hirschman coefficient. This is because it is more flexible with respect to the choice of commodity classification and does not require classification according to industrial output.

The market share variable will be measured by the index

$$Z = [\sum_{i=1}^n x_{ij} d_{ij}] / 2 \dots \dots \dots 3.10$$

where,

x_{ij} = proportion of commodity i in the world market.

d_{ij} = Proportion of commodity i in the exports of country j.

This index has been used by Massell (1970) and Hock (1977). It is the only index that has been used in previous studies to measure market share variable. It gives a weighted value of world market share as a proportion of a country's exports. This index

will be used in this study and will be computed on the basis of two products, coffee and tea. These are the only products which Kenya has had a relatively higher market share since independence.

Food and raw material ratios will be defined as the share of export values of commodity SITC categories 0,1,22,4 and 2,3,67,68, respectively¹² in total exports.

Consumption ratio index will be calculated as the proportion of coffee and tea consumed to total value of exports. These are the major export products which are also domestically consumed. Finally, the exchange rate variable will be proxied by the shilling per dollar exchange rate. This has been chosen because of data availability and consistency. The real exchange rate, will be calculated as follows¹³:-

$$RER_t = \sum_{i=1}^n NER_{it} [WPI_t / CPI_t] \dots \dots \dots 3.11$$

where,

- RER = Real exchange rate
- NER = Nominal exchange rate
- WPI = Wholesale price index for trading partners
- CPI = Consumer price index for Kenya.

¹² 0 =Food & live animals
 1 =Beverages & tobacco
 22 =Oil seeds & oleaginous fruits
 4 =Animals & vegetable oils & fats
 2 =Crude materials, inedible, except fuels
 3 =Mineral fuels, lubricants & related materials.
 67 = Iron & steel

¹³ World Bank Economic Review, 1989, P.246.

3.2 Modelling And Hypotheses.

Economics does not provide a specific economic theory that underlies instability in export earnings. An 'experimental approach' will therefore be followed in this section to determine the functional form of the model. The direct linear and semi-log models will be evaluated to determine which of them best explains the variations in export earnings instability. The semi-log model is used here because some values of export earnings instability index are negative which makes only the independent variables logarithmic. The model is specifically defined as linear log. "This is a function where the dependent variable is in its original form and the independent variables are expressed in logarithms. It implies that a percentage change in the independent variable has the same absolute effect on the dependent variable irrespective of the level of X" (Johnson page 249).

Illustration 1

Let the original function be

$$Y = \beta_0 + \beta_1 \log X \dots \dots \dots 3.12$$

Let X change by a small percentage say μ . The new Y will be :

$$Y' = \beta_0 + \beta_1 \log (X + \mu X) \dots \dots \dots 3.13$$

The change in Y is given by subtracting equation 3.12 from 3.13, that is,

$$Y' - Y = \beta_1 [\log X(1 + \mu) - \log X] \dots\dots\dots 3.14$$

hence the change in Y for a given change in X is constant regardless of the actual level of X.

Illustration 2

Let

$$Y = 16 + 29 \log X \dots\dots\dots 3.15$$

If $X = 15$, $Y = 91.53346$. Let X increase by 20% to 18. Y will be 99.82078 an increase of 5.28732.

On the other hand, if $X = 25$, $Y = 109.3471$. Letting X increase by 20% to 30, Y increases to 114.63472 for an increase of 5.28732. Clearly then, a 1% change in X results in the same absolute change in Y regardless of the value of X at which the change in X occurs.

However, the elasticity of function 3.13 is given as:

$$\epsilon = (\beta_1 / X) (X / Y) = \beta_1 \dots\dots\dots 3.16$$

which implies that for any given percentage change in X, the percent increase in Y will decrease as X increases. This will be the effect on instability arising from changes in any positive independent coefficient.

On the other hand, variables whose coefficients are negative will have the same formulation for their elasticities but with a negative sign. The implications of this is that an increase in the independent variable will lead to a decrease of the dependent

variable but if X increases Y continues to decrease but at an increasing rate.

This experiment will largely employ two levels of statistics, namely, the R^2 and F-statistic. This two statistics are customarily used to test for the functional form of the models. The linear model will be of the following form:

$$I_x = \beta_0 + \beta_1 F_r + \beta_2 R_r + \beta_3 C_c + \beta_4 G_c + \beta_5 Z + \beta_6 C_r + \beta_7 E_r + e_1 \dots \dots \dots 3.17$$

whereas the log linear form will be specified as:

$$I_x = \beta_0 + \beta_1 \log F_r + \beta_2 \log R_r + \beta_3 \log C_c + \beta_4 \log G_c + \beta_5 \log Z + \beta_6 \log C_r + \beta_7 \log E_r + e_1 \dots$$

The following are the working hypotheses based on theory and findings of previous studies. Food and raw materials are expected to affect earnings instability from the supply side. Food has a lower income elasticity of demand, therefore income changes in export markets is expected to result in less variations in export earnings. The coefficient of food ratio is thus expected to be vary negatively with instability implying that increased food exports lower the incidence of instability in export earnings.

Raw material exports on the other hand, have a higher income elasticity of demand. Their demand will vary with the level of economic activity. Consequently, income changes will lead to higher variations in earnings of the exporting countries. The coefficient of raw material ratio is thus expected to vary positively with instability in export earnings. This implies that increased raw material exports is bound to result in higher export instability.

Instability is hypothesized to decline with increase in the market share of export products in world markets. The rationale for this is that an increase in market share of a commodity, implies a less elastic market demand while a very low market share implies a country faces an extreme elastic demand market. In this latter situation, changes in supply results in a wide dispersion in export earnings. Market share index is therefore expected to vary negatively with export instability.

Geographical and commodity concentration are expected to be positively related to instability. This is because, lower levels of concentration imply high level of diversification. On the other hand, higher concentration levels imply less diversification. The latter case however, is expected to be associated with higher levels of instability. It follows therefore, that the correlation between either geographical or commodity concentration with instability index should be positive.

The coefficient of real exchange rate variable is expected to vary positively with export instability. This relationship is expected based on the results of previous studies. (Hazell (1989) has postulated that real exchange rate is positively related to earnings variations through the domestic price.¹¹ The real exchange rate is related to changes in income through a process of transformation from export unit value in foreign currency to domestic prices in local currency.

¹¹ $EUV_c = EUV_f * rr$. Where,
 EUV_f = Export unit value in US\$
 EUV_c = " " " local currency.
 rr = Real exchange rate.

The coefficient of the consumption ratio variable, is expected to affect export earnings through export quantity variations. The assumption here is that there is no direct covariance between domestic exports with world prices. A rise in consumption ratio would in normal situations result in less exports and therefore less earnings. On the other hand, a fall in consumption ratio would raise the quantity of exports and earnings respectively. This relationship is subject to the assumption that there is no covariance between domestic export quantities and world export price. If reductions in the quantity of exports lead to higher prices then there may be no effect on export earnings. The price rise would in this case offset the expected impact of increased domestic consumption on export earnings reduction.

3.3 Approach to the Analysis of Commodity and Market Contribution to Export Instability

In assessing the relative contribution of various markets and commodities towards the variations in instability, the study will focus on 11 commodities. These are: coffee, tea, petroleum products, sisal, meat and products, cement, hides and skin and soda ash. These commodities were selected on the basis of their relative significant share in the value of total exports.

The countries included in the assessment of the contribution of markets to instability are USA, Canada, Japan, Belgium, Sweden, France, Germany, Italy, Netherlands, Britain, Burundi, Rwanda, Uganda, India, Pakistan, and Thailand. Again these countries were chosen because they constitute traditional trading partners of Kenya. An index of instability for each of the

commodities and markets will be specified for the period 1963-90. This will be used to compute an index showing the contribution of each commodity and market outlet to instability. This index can be specified as:

$$CP_j = \left[\frac{(IDX_j)}{\sum_{i=1}^n (IDX_i) R_i} \right] \times 100 \dots \dots \dots 3.19$$

Where,

R_j = mean percentage share of each commodity or market outlet.

n = number of commodities or market outlets.

IDX = Absolute instability index for each commodity and market outlet.

This index was first employed by Coppock (1962). The index shows that the contribution of each commodity to total export instability depends on both its absolute instability and the relative share in the total export.

For each commodity and market, the ratio of this index to the market share (R_j) will be obtained. This will give the proportional contribution to market share. A value less than unity is considered desirable because the commodity shall then be contributing less to earnings instability relative to market share. A value of unity implies a commodity contributes to overall earnings instability proportionally to its share in the export earnings. However, a value above unity is undesirable. The implication is that, a marginal increase in the relative share of a particular commodity, yields a more than proportional rise

in overall export earnings instability. The same logic holds for the various market outlet ratios.

3.4 Data Sources and Limitations of the Study.

This study uses annual time series data. Data on export earnings was obtained from United Nations Yearbook of Statistics. The shilling per dollar exchange rates was obtained from the IMF International Financial Statistics. Export values of food and raw materials given under SITC categories 0,1,22,4 and 2,3,67, and 68 respectively, were obtained from the Annual Reports (Kenya and East Africa).

Export values of coffee and tea used to compute market shares were obtained from UN Yearbook of Trade Statistics.

Due to constraints on data availability, several proxies were used. The consumption ratio variable, for instance, was computed based on only 2 commodities, coffee and tea.

Data used in this study involves a series of transformations. Food and raw material ratios were obtained as a ratio of SITC values of categories 0,1,22,4 and 2,3,67,68 to total export earnings in each year.

Market share index Z, was obtained from 2 major commodities coffee and tea due to lack of data. For each commodity, the proportion of annual total export earnings to the value of world total marketed output was multiplied by the proportion of each commodity in the national total export earnings. This product was summed for all commodities. The average was then taken as an index of market share for each year.

To measure geographical concentration, the proportion of

export earnings from each market to total export earnings was first obtained for each year. The sum for all market outlets was then squared and summed. A square root was obtained for each of the values for each year to represent geographical concentration.

The process of transforming annual export earnings from each market was repeated for each commodity specified in footnote 2.

Consumption ratio was obtained from export earnings of coffee and tea. This restriction was again due to data constraints. The values of export earnings from these commodities were summed for each year and divided by the value of export earnings for each year. Finally, the real exchange rate was obtained firstly, by dividing the whole sale price index for trading partners by the consumer price index for Kenya. This was multiplied by the nominal exchange rate. This product was taken as the real exchange rate for each year.

One key limitation of this study is the failure to address instability in export earnings accruing from the sale of service exports for example tourism, freight and travel. This has largely been due to absence of consistent data for these services.

CHAPTER FOUR

ANALYSIS.

4.0. Introduction.

Chapter three outlined two major issues to be examined by this study. First, is to test two models that explain export instability, the linear and log linear models. This is done with a view to determine the appropriate model that explains export instability in Kenya. Six equations are estimated. Their general form is:

$$I_x = f(\beta_1 R_f, \beta_2 R_r, \beta_3 G_c, \beta_4 C_c, \beta_5 C_r, \beta_6 E_r, \beta_7 Z, e) \dots \dots 4.1$$

The second issue is to analyze how export commodities and market outlets contribute to total export instability. This findings are provided in sections 4.2 and 4.3.

This chapter discusses the findings and their implications. The statistical significance of the estimates of the parameters used in the analysis will also be analyzed.

4.1 Model Selection.

Four types of statistics were used to analyze the results. These are the t-statistics, F-ratio, R^2 (the coefficient of multiple determination) and the standard errors. The t-statistic was used to test the significance of the estimated coefficients. This statistic was chosen because the sample size was less than 30. The F-ratio was used to test the significance of the R^2 ; while the standard errors were used to detect incidence of multicollinearity among the regressors. The results are summarized in table 4.2.

Equation 1 gives the results obtained from the estimation of a linear function. This equation could explain only 27.7% of the variations in export instability. Equation 2 gives the results obtained from the estimation of the log linear model. In this equation, the explanatory power of the variations in export instability is 36.8% which is higher than for the previous equation. Surprisingly, in both equations, none of the explanatory variables were significant at both 0.05 and 0.1 level of significance. Notwithstanding these results, an F-test was conducted to ascertain the significance of the coefficient of multiple determination (R^2), that is whether the explanatory variables actually have any significant influence on export earnings instability¹⁵.

In both equations the null hypothesis was accepted. This implies that the explanatory variables in the model did not explain a significant proportion of the total variations in export instability.

A close examination of the standard errors showed that the standard errors for the log linear model were relatively lower than those of the linear model, except for commodity concentration variable. This implies that the multicollinearity¹⁶ problem was less in the log linear model than the linear. On the basis of this and the relatively higher

¹⁵ The hypothesis tested were, the null hypothesis symbolized by H_0 : and the alternative hypothesis H_a :
 $H_0: b_1 = b_2 \dots b_n = 0$.
 $H_a: b$'s are not equal to 0.
 b 's being the coefficients.

¹⁶ Multicollinearity in a model increases the variances of the coefficients rendering them inefficient estimators.

overall explanatory power (R^2) of the log linear model, the direct linear model was rejected in favour of the log linear model, for further analytical work.

Equation 3 gives the results obtained after dropping commodity concentration and market share variables which were highly correlated with other variables (see table 4.2, equation 2) in a bid to solve multicollinearity. The standard errors of this equations were relatively lower implying multicollinearity problem had been significantly reduced. Raw material ratio was positive and significant at both 5% and 10% while consumption ratio was positive and significant at 10% level. These findings are consistent with the hypothetical expectation that if the bulk of a country's export comprises of raw materials or intermediate goods, then that country will be prone to instability in export earnings.

A unit rise in the proportion of export of raw material to total exports will increase instability in export earnings by 4.8% (according to equation 3.14).

Equation 3 however, had a lower R^2 . An F-test showed that R^2 was still not significant thereby implying the independent variables did not explain a significant proportion of the variations in export instability.

Equation 4 excludes food ratio and real exchange rate value which had very low t-values. All the three variables included in this model became significant. Raw material and consumption ratios were significant at both 5% and 10% levels; whereas geographical concentration was significant at 10%. The standard errors were lower suggesting a low incidence of

multicollinearity. Although R^2 , had declined, the F-test statistics, was found to be statistically significant at 5%. This implies that the variables were significant explanatory variables of the variations in export earnings instability. The signs of all the three variables conformed to the theoretical expectations. Both raw material and consumption ratio coefficients had positive signs. The implications of this is that increased raw material exports results in higher earnings instability. A unit percentage rise in raw material exports results in 4.49% rise in export receipts instability. In the same way, exports of goods that are mainly consumed domestically gives rise to higher instability in export earnings. A unit rise in the proportion of goods consumed domestically results in 28.11% rise in export earnings instability.

Geographical concentration had a negative coefficient. This result indicates that if Kenya raises the level of market diversification by 1%, instability in export earnings is bound to rise by 13.78% . This results however, contradicts the hypothetical expectation, where market diversification is meant to reduce earnings instability.

Equation 5 shows the results after the real exchange rate variable was introduced. The R^2 , rose to 32.1% . An F-test however, indicated that R^2 was not significant. The coefficients of raw material ratio and consumption ratio were significant, while the coefficient of geographical concentration was not significant. The real exchange rate coefficient was also not significant at either the 5% or 10% levels of significance.

Equation 6 excluded the real exchange rate since it did not

serve to improve the model. The food ratio variable was introduced instead. The R^2 declined to 30.6% and was not significant using the F-test statistics. The coefficient of the new variable, food ratio, was not significant at both 10% and 5%; all the other three variables were however significant.

From the above results, it can be concluded that raw material ratio, geographical concentration and consumption ratio are the only variables that explain export earnings instability in Kenya.

These findings differ significantly from those of past studies. Soutar (1977), Athukorala (1987), Lee (1977), Naya (1973) and MacBean (1966) found a negative correlation between geographical concentration and export earnings instability. The coefficient was however not significant in all the studies.

In all the above studies, only Massell (1978) included the consumption ratio variable in the estimated model. The study however found a negative and significant coefficient for the raw material variable.

Other studies including Idachaba (1974), Naya (1973) and MacBean (1966) did not distinguish the raw material 'component' from the primary product 'component'. Consequently, these studies did not have the raw material variable in their functions. Only Idachaba (1971) found a significant relationship between primary product variable and export earnings instability.

4.2 Commodity Contribution to Export Earnings Instability.

Table 4.3 gives the various ratios used to compute the contribution of each commodity to total earnings instability. IDX is the absolute instability index for the period 1963-90, R is

the mean percentage share of each commodity, CP is the percentage of each commodity to total instability, and (CP/R) is the contribution percentage ratio of each commodity. This index CP/R shows the percentage rise in total export earnings instability arising from a unit rise in the share of each commodity in total exports. IDX was derived from averaging the sum of the percentage change in earnings for each of the commodities. Negative values of this index indicate the most unstable pattern of earnings from the corresponding commodity. R was derived as the percentage share of each commodity in total export earnings for the entire period. Higher values correspond to higher percentage shares. Conversely, lower values correspond to lower percentage shares.

CP was derived by multiplying the absolute instability index (IDX) of each commodity by its relative share R, and expressing it as a percentage of the sum of the product. A negative value for this index implies that the commodity contributes more to stability in export earnings. A positive sign, on the other hand, implies the commodity contributes to instability in export earnings. Absolute values of this index are all in percentages. CP/R is derived by expressing CP as a ratio of R, the relative share of each commodity. If this index exceeds 1 for any given commodity then that commodity is a contributor to instability. On the other hand, if the value is less than one, then that particular commodity contributes more to stability relative to its share in total export. (CP/R) is the decisive ratio in this section of the analysis.

The table shows that coffee has the highest value of CP/R. This implies that a marginal increase in the relative share of

coffee in total exports results in a more than proportionate rise in overall export earning instability. A unit rise in the share of coffee in total exports would contribute to an increase in total export instability by 1.99%. This is followed closely by tea with an index of 1.51, petroleum products, 1.39, hides and skins, 0.38, and cement 0.09, respectively. The remaining products; soda ash, pyrethrum, sisal, maize, fruits and vegetables, and meat products all bear negative value of CP/R. This implies that a rise in the share of each of these commodities in the total exports results in reduction in export earnings instability. Soda ash will reduce instability by 0.05%, Fruits and vegetables will reduce instability by 2.1%, maize by 0.54%, pyrethrum by 0.24%, while sisal will reduce instability by 0.28%. For instance, a unit rise in the proportional share of meat and meat products results in reduction in export instability by 6.2% , while in the case of fruits and vegetables the reduction would be 2.1% .

The order of contribution of each commodity to overall instability is demonstrated in figure 4.1.

4.3 Market Contribution to Total Export Instability.

The indices used in this section are analogous to those used in the previous sections. As before, negative values of IDX indicate the most unstable earnings from the corresponding country, R represents the percentage share of exports destined to each of the markets, CP is the contribution of each market to total instability. A negative value of CP index indicates that the country contributes more to export stability by the

corresponding percentage. A positive value on the other hand, indicates that increased exports to that particular market results to higher instability in export earnings by the corresponding percentage.

Table 4.4 shows the contribution (CP/R) of each markets to instability. The leading contributor to instability is the United Kingdom, with an index of 3.26. This implies that a unit increase in the share of total exports destined to UK results in 3.26% rise in total export earnings instability.

Although the Italian market ranks seventh as the destination of Kenya's total exports, it is the least contributor to Kenya's export earnings instability. In fact, the index is negative implying that higher exports to this market would lead to lower earnings instability. Ugandan market is third to UK and Germany and accounts for 10.26% of the total exports by value. It is however, second to UK in terms of its contribution to total export instability. A unit rise in exports destined to the market raises instability by 2.97%. The percentage share of total exports destined to Sweden is only 1.53%. A unit rise in this proportion however, raises instability in total export earnings by 2.27%.

Japan, Burundi, Rwanda and India all bear a zero coefficient of (CP/R). This values originated from column 1 where their instability indices were zero. These values were hence too low to facilitate the computation of the rest of the indices CP and CP/R respectively. Consequently, the zero values should not be interpreted to mean that these markets contribute to stable earnings.

Figure 4.2 shows the order of percentage contribution of each market to overall export instability.

CHAPTER FIVE

Conclusion And Policy Recommendations.

5.0 Introduction.

Chapter one identified three aims of this study. The first objective was to identify and estimate a model that explains the causes of export earnings instability in Kenya. The second objective was to assess the contribution of key commodity exports and market outlets to earnings instability. Finally, on the basis of the results obtained from empirical analysis policy implications and recommendations were to be made.

Chapter three proceeded to outline the approach adopted in this study to meet the above objectives. The methodology focused on econometric and statistical analyses. The econometric analysis was used to determine the causes of export instability while the statistical analysis was used to assess the contribution of various commodities and market outlets towards earnings instability.

Chapter four highlighted the major findings of the study. The implications of the findings were also discussed.

This chapter will give a brief summary of the major findings and discuss policy implications. It will also provide discussion on policy recommendations on possible ways and means of curbing export instability. Finally, the limitations of this analysis will be discussed.

5.1 Summary of Findings

5.1.1 Causes of Export Instability.

This study has revealed that the major determinants of

export earnings instability in Kenya can be grouped into two. The first is the export product composition and the second is the market destination.

It is argued that Kenya's raw material exports largely contribute to instability in export earnings. In addition, increased exports of commodities which are demanded and consumed domestically, results in excessive fluctuations in export earnings.

It is also found that geographical concentration of Kenya's exports generates a more stable pattern of export earnings.

5.1.2 Commodity Contribution to Export Instability

The analysis of commodity contribution to export instability shows that Kenya's traditional exports namely coffee and tea are the leading contributors to export earnings instability. Coffee contributes 1.99% of the total export earnings instability whereas tea contributes 1.51%. The other three contributors are petroleum products 1.39%, hides and skins 0.38% and cement 0.096%. The following export products were found to contribute to stability in Kenya's export earnings instability. Meat and meat products 6.2%, fruits and vegetables 2.1%, maize 0.54%, sisal 0.23%, pyrethrum 0.24% and Soda ash 0.05%.

5.1.3 Markets Contribution to Export Earnings Instability.

It was found that U.K, the largest export trade partner, contributed the most for Kenya's exports earnings instability. Indeed, the trend revealed that apart from Italy, France, Belgium, Netherlands and Canada whose markets contributed to

increased stability in Kenya's export earnings, the rest of Kenya's major historical markets viz, UK, Uganda, Sweden, Germany, Pakistan and USA contribute to instability in Kenya's export revenues. Their contribution levels to instability were 3.26%, 2.97%, 2.27%, 1.27%, 1.02% and 0.28% respectively.

Empirical results show that market diversification of Kenya's exports is not a necessary prescription for achieving stability in Kenya's export earnings. The implication of this findings is that market concentration of Kenya's exports does not lead to general instability in export earnings. However, the case study on specific markets showed that some markets do infact contribute to instability in export earnings.

Market share and real exchange rate were not significant variables in the model for export instability in Kenya. The sign however for market share indicated that a rise in market share of Kenya's export results to higher instability. On the other hand, real exchange rate was inversely related to instability, implying that positive changes in real exchange rate would lead to lower export earnings instability. This findings do not conform to the widely held notion that commodity concentration, geographical concentration, market share and real foreign exchange rate are the major causes of export instability in third world countries.

The study therefore demonstrates that much of the policy prescriptions drawn from cross-sectional studies by MacBean (1966), Naya (1973), Massell (1970) and Idachaba (1974) are indeed not applicable to all the countries. Individual countries bear distinct structural differences that calls for case studies

which take account of the specific differences.

5.2 Policy Implication.

The purpose of making any policy recommendations is to enhance development. The emphasis of this study has been the causes of export instability. This study will not be complete if it fails to address development issues by primarily making policy recommendations. The recommendations made in this study are aimed at stemming further instability in export earnings. By so doing, this study will go along way in providing alternatives towards achievement of optimum benefits from trade.

5.2.1 Causes of Export Instability.

This study has demonstrated that commodity concentration is the major cause of export instability. Increased exports of raw materials and commodities which are domestically demanded results in higher instability in exports earnings.

This implies that, in a bid to curb export earnings instability, the Kenya government should mobilize resources towards promotion of non-raw material exports such as food, manufactured products for final use and not for intermediate use. Food exports have low income elasticities hence income changes resulting from business cycles in the importing countries result in less fluctuations in earnings from exports of food and final use-manufactured products.

These results present great challenges to the agricultural sector. Firstly, this sector has not been capable of producing sufficient food for domestic consumption over the years.

Notwithstanding, this study recommends that increased exports of food will reduce instability in export earnings. To resolve this dilemma, there is need to mobilize resources in this sector. Food exports should constitute 'surplus production' in excess of domestic demand.

This study does not support the notion that market diversification enhances stability in export earnings. Kenya's traditional export markets on the whole appear to generate relatively stable earnings. Certain market outlets contribute to stable earnings whereas others contribute to unstable earnings.

5.2.2 Export Instability by Trading Partners.

The study reveal that UK, Uganda, Sweden, Germany, Pakistan and USA markets contributed heavily towards instability in Kenya's export earnings. On the other hand, Italy, France, Belgium, Netherlands and Canadian markets generated stable export earnings. The implication of these findings is that, for Kenya to reduce instability in export earnings, more exports have to be directed to those markets that generate stable earnings and away from those markets associated with earnings instability.

For this to occur certain specific policy alternatives will need to be pursued. The policies should emphasize export promotion to those countries that have proven to generate stable earnings. These activities should include, trade exhibitions, advertisements and closely co-ordinated inter-country seminars.

The efficacy of these policies will however, have to confront certain limitations. The strategy primarily prescribes

a bilateral approach with the concerned countries. However, some of the countries are members of economic unions and therefore pursue uniform multi-lateral trade policies against non-member trade partners. A good example here is the European Economic Community (EEC).

5.2.3 Export Instability by Commodity Structure.

Earlier in the analysis, it was shown that coffee, tea, petroleum products, hides and cement were the major contributors to instability in export earnings. From this it is recommended that in order to achieve long run stability in export earnings, the Kenya government should promote those commodities which contribute to stable export earnings. This policy has in the past been adopted in East Asia by the Newly Industries Countries (NICs) with remarkable success¹⁷. The strategy involves identifying certain key industries and providing them with the necessary tax, financial, infrastructural and preferential such as exemptions from export duty and import tariffs.

The strategy is not new in Kenya. Indeed, export processing zones have been set aside with all desirable facilities. However, this has not been without certain shortcomings. The policy strategy does not spell out export "target commodities" or "target industries". It is a free field for any prospective exporter. The government policy is quite ambitious to achieve higher exports, but lacks foresight on the possible danger of instability in export earnings. The export promotion strategy

¹⁷ See the JETRO Publication on "The East Asian Experience in Economic Development", 1993.

should have been preceded by a comprehensive study on the commodities intended for export. Such a study could clearly show among others, whether or not the intended export products are prone to instability in earnings.

It is recommended therefore in this study that in the pursuit of this noble programme, great emphasis should be put on those export products that contribute less to instability in export earnings. This study has only managed to establish six of these, namely soda ash, fruits and vegetables, maize, pyrethrum, sisal and meat and its products.

5.3 Limitations of The Study.

The major limitation of these study centres on data. The study covered the period 1963-1990. This period was marked by several shocks, inter alia, the oil shock of the 1970s, drought (1982, 1984, 1991, 1992), and the process of Structural Adjustment Programmes that begun in 1980. These factors may have been responsible in shaping the data used throughout this study. Consequently, the findings may not hold in different economic scenarios. It is therefore important for users of this findings to be cautious about this.

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TABLE 4.1

Regression Results.

(Figures in parantheses are t-values)

Equations	1	2	3	4	5	6
R2	0.277	0.368	0.328	0.283	0.321	0.306
F-RATIO	1.09	1.66	2.15	3015	2.72	2.53
FOOD.RATIO	-30.275 (-0.781)	-5.281 (-0.987)	-2.156 (-0.488)			-3.569 (-0.875)
RAW.MAT.RAT	565.01 (0.324)	29.602 (1.220)	26.352 (2.080)	24.628 (2.010)	24.181 (2.073)	28.091 (2.259)
GEOG.CON	-67.708 (-1.441)	-60.06 (-0.952)	-63.616 (1.190)	-75.57 (-1.491)	-60.325 (-1.157)	-75.6 (-1.503)
COM.CON	346.627 (1.032)	-46.42 (-0.059)				
CON.RATIO	76 (0.521)	12.293 (0.473)	30.465 (1.590)	28.112 (1.746)	25.645 (1.588)	35.378 (1.946)
REXCHA.RATE	2.176 (0.0450)	-6.288 (-0.624)	-8.19 (-0.857)		-9.929 (-1.139)	
MKT.RATIO	0.047 (0.392)	14.463 (1.071)				
CONSTANT	-725.555 (-1.013)	113.082 (0.155)	155.95 (1.910)	173.445 (2.872)	135.359 (1.970)	196.494 (2.970)

Table 4.2

CORRELATION MATRIX FOR THE REGRESSION VARIABLES.

	Exp. Ins	log3	log6	log4	Constant			
Exp. Ins	1							
log3	0.41	1						
log6	0.23	0.03	1					
log4	-0.19	-0.12	0.41	1				
Constant	0	0	0	0	1			
	Exp. Ins	log2	log3	log4	log5	log6	log7	
Exp. Ins	1							
log2	0.22	1						
log3	0.37	0.44	1					
log4	-0.18	0.21	-0.09	1				
log5	0.37	0.73	0.71	0.31	1			
log6	-0.23	0.6	0.1	0.37	0.51	1		
log7	-0.08	0.19	0.03	0.31	0.1	0.08	1	
log8	0.23	0.55	0.07	0.23	0.42	0.77	0.06	
	Exp. Ins	log3	log4	log6	log7	Constant		
Exp. Ins	1							
log3	0.41	1						
log4	-0.19	-0.12	1					
log6	0.23	0.03	0.41	1				
log7	-0.29	-0.07	0.23	-0.03	1			
Constant	0	0	0	0	0	1		
	Exp. Ins	log3	log4	log6	log2	Constant		
Exp. Ins	1							
log3	0.41	1						
log4	-0.19	-0.12	1					
log6	0.23	0.03	0.41	1				
log2	0.1	0.3	0.14	0.47	1			
Constant	0	0	0	0	0	1		

Continuation

	Exp.Ins	log2	log3	log4	log6	log7	Constant
Exp.Ins	1						
log2	0.1	1					
log3	0.41	0.3	1				
log4	-0.19	0.14	-0.12	1			
log6	0.23	0.47	0.03	0.41	1		
log7	-0.29	0.26	-0.07	0.23	-0.03	1	
Constant	0	0	0	0	0	0	1

	Exp.Ins	1	2	3	4	5	6
Exp.Ins	1						
1	0.22	1					
2	0.37	0.44	1				
3	-0.17	0.21	-0.08	1			
4	0.37	0.73	0.71	0.31	1		
5	0.23	0.6	0.1	0.37	0.51	1	
6	-0.08	0.19	0.03	0.31	0.11	-0.08	1
7	0.23	0.55	0.07	0.23	0.42	0.77	0.06

- KEY:
- Exp.Ins = Export Instability
 - Log 2 = Food Ratio
 - Log 3 = Raw Material Ratio
 - Log 4 = Geographical Concentration
 - Log 5 = Commodity Concentration
 - Log 6 = Consumption Ratio
 - Log 7 = Real Exchange Rate
 - Log 8 = Market Share Ratio

TABLE 4.3

Commodity Contribution to export earnings ins

COMMODITIES	IDX	R	CP	CP/R
COFFEE	-2.01	32.18	64.06	1.99
TEA	-1.52	23.38	35.2	1.51
PETROLEUM PRODUCTS	-1.4	21.36	29.62	1.39
SISAL	0.28	2.26	-0.63	-0.28
MEAT AND MEAT PRODUCTS	6.26	1.11	-6.88	-6.2
PYRETHRUM	0.24	1.98	-0.47	-0.24
MAIZE	0.55	1.58	-0.86	-0.54
FRUITS AND VEGETABLES	2.12	9.61	-20.18	-2.1
CEMENT	-0.09	2.46	0.22	0.09
HIDES AND SKINS	-0.38	2.08	0.78	0.38
SODA ASH	0.05	1.47	-0.07	-0.05

Table 4.4 Country Contribution to Export Instability.

COUNTRY	IDX	R	CP	CP/R
UGANDA	-21	10.26	30.51	2.97
USA	-2	4.9	1.39	0.28
CANADA	-1	1.16	-0.16	-0.14
JAPAN	0	1.19	0	0
BELGIUM	2	1.4	-0.4	-0.29
FRANCE	4	1.39	-0.79	-0.57
GERMANY	-9	11.83	15.07	1.27
ITALY	7	3.19	-3.16	-0.99
NETHERLANDS	1	5.42	-0.77	-0.14
UNITED KINGDOM	-23	15.23	49.6	3.26
BURUNDI	0	1.21	0	0
RWANDA	0	2.8	0	0
INDIA	0	0.79	0	0
PAKISTAN	-7	3.22	3.29	1.02
SWEDEN	-16	1.53	4.15	2.27

Table 4.5

Export Earnings Instability Indices.

1963	22.52
1964	10.08
1965	-4.72
1966	-10.25
1967	-35.02
1968	-46.8
1969	-49.12
1970	-48.33
1971	-58.38
1972	-44.68
1973	-10.78
1974	5.68
1975	-15.33
1976	14.71
1977	39.67
1978	25.75
1979	25.88
1980	35.49
1981	10.95
1982	-7.92
1983	-6.05
1984	-6.65
1985	-13.13
1986	6.43
1987	-23.19
1988	-19.35
1989	-19.8
1990	-19.5

Table 4.6/

Data on Kenya's Commodity Export Earnings

Year	Coffee	Tea	PP	Sisal	M & MP	Prtm	Mze	F & Veg.	Cement	H & S	Soda Ash
1963	220.3	113.3	1.54	150.64	51.34	50.86	31.48	45	10.06	23.36	24.68
1964	308.64	128.52	93.44	120.56	50.3	43.34	1.08	50.8	33.7	25.88	14.16
1965	282.54	129.52	196.88	77.04	56.58	39.28	0.06	57.12	36.38	35.12	16.12
1966	376.1	183.58	213.36	66.8	67	47.94	0.02	54.3	34.54	51.46	22.22
1967	313.9	157.4	237.2	42.28	63.06	48.46	28.48	58.34	33.88	34.84	20.44
1968	256.5	206.18	221.26	36.64	67.04	50.08	95.94	67.98	43.46	33.42	22.64
1969	337.16	234.1	257.58	34.42	59.2	44.56	71.98	70.94	47.22	37.46	19.14
1970	445.46	263.64	282.6	37.56	64.12	35.04	2.34	95.48	61.26	33.16	34.84
1971	390.6	243.48	354.92	30.46	79.6	55.32	0.18	92.02	54.96	48.84	38.5
1972	495.38	329.7	388.2	41.44	104.46	75.88	9.56	117.4	54.76	75.54	39.98
1973	715.54	339.4	426.04	95.86	78.96	58.62	127.86	115.24	54.84	103.8	57.18
1974	767.74	387.82	912.28	339.14	93.5	91.2	49.2	148.62	90.82	88.82	41.58
1975	704.08	458.64	1171.04	148.64	102.7	70.12	101.22	204.96	120.12	108.28	48.7
1976	1866.06	635.26	1379.32	83.84	167.72	114.54	112.88	314.82	161.38	171.22	60.66
1977	4087.55	1435.59	1533.12	78.78	151.94	123.62	13.19	457.9	171.33	160.45	53.74
1978	2495.31	1263.86	1368.4	78.38	54.15	81.65	14.27	402.67	180.14	196.39	73.69
1979	2213.97	1256.87	1559.8	95.77	53.79	110.05	106.51	430.47	168.93	275.41	106.88
1980	2163.7	1160.07	3254.11	176.53	31.65	180.55	0.08	504.64	203.08	190.95	146.61
1981	2196.64	1224.61	2795.88	174.96	52.01	127.42	1.35	1650.75	288.37	183.81	116
1982	2892.62	1551.14	2985.31	217.49	90.72	200.13	6.54	768.5	386.1	158.03	154.61
1983	3202.28	2468.42	2689.37	242	79.95	193.73	243.17	1098.78	492.77	126.61	191.55
1984	4073.09	3788.75	2851.61	249.96	148.18	205.67	118.54	1083.91	350.4	142.44	236.72
1985	4612.74	3828.19	2384.75	281.75	137.12	203.32	24.81	1058.33	308.39	199.77	329.34
1986	7768.63	3455.53	2049.66	215.6	31.77	245.68	292.57	1323.1	267.63	252.23	328.39
1987	3892.17	3267.13	2009.94	192.99	4.33	201.71	389.18	1542.76	197.41	337.66	272.48
1988	4894.72	3707.64	3201.82	234.62	3.74	236.69	401.94	1882.39	208.02	522.08	372.26
1989	4076.56	5437.98	2340.98	323.16	25.45	350.41	311.32	1819.35	218.98	271.66	442.42
1990	4489.94	6327.66	3017.72	378.82	111.66	434.66	413.39	2560.54	252.44	23.73	487.1

KEY:

PP = Petroleum Products

M & MP = Meat and Meat Products

Prtm = Pyrethrum

MZE = Maize

F & Veg = Fruits and Vegeta

H & S = Hides and Skins

Year	Com.con	Geo.con	Raw.rat	Food.rat	Mkt.shr	RER	Con.rat	Inst.Ind
1963	2.263675	1.295063	0.010452	0.017846	30.94	104.6433	0.157411	22.52
1964	2.259665	1.526867	0.009889	0.017849	38.3	103.1558	0.142948	10.08
1965	2.267654	1.132423	0.010155	0.016172	28.75	104.2681	0.125444	-4.72
1966	2.266737	1.490134	0.010015	0.018791	40.155	106.5264	0.156397	-10.25
1967	2.271522	1.275248	0.009691	0.018196	36.88	107.8598	0.13362	-32.02
1968	2.27162	1.322834	0.008742	0.019575	43.775	105.914	0.120988	-46.8
1969	2.274775	1.398726	0.008834	0.411324	46.775	108.2832	0.139245	-49.12
1970	2.267657	1.537399	0.008245	0.414591	55.17	104.4933	0.163682	-48.33
1971	2.274071	1.394233	0.009897	0.366114	40.388	101.7165	0.137622	-58.38
1972	2.271858	1.264174	0.009742	0.404415	48.928	99.46769	0.147383	-44.65
1973	2.262416	1.255422	0.010034	0.395113	48.7415	94.07499	0.136042	-10.78
1974	2.267575	1.146234	0.014301	0.328857	50.658	87.6319	0.115705	5.68
1975	2.287134	1.223908	0.013938	0.393684	42.075	94.10555	0.122351	-15.33
1976	2.332108	1.420872	0.011239	0.468635	57.72	82.43148	0.194299	14.71
1977	2.311087	1.433698	0.011857	0.61423	156.795	91.5794	0.288742	39.68
1978	2.304551	1.310972	0.01503	0.518738	134.105	105.6424	0.109816	25.75
1979	2.29643	1.239613	0.015131	0.521663	115.755	102.4888	0.209118	25.88
1980	2.357327	1.137281	0.021168	0.42824	126.85	97.38087	0.184572	35.49
1981	2.35887	1.265674	0.020984	0.602614	131.58	94.5646	0.171935	10.95
1982	2.322532	1.721985	0.017973	0.610167	135.4	94.84846	0.189996	-7.92
1983	2.325003	1.601278	0.014723	0.620209	142.56	89.73611	0.226357	-6.05
1984	2.328042	1.458598	0.013357	0.702729	178.53	94.09763	0.340421	-6.65
1985	2.338734	1.381057	0.013128	0.654947	164.07	100	0.279484	-13.13
1986	2.343119	1.378436	0.00997	0.674446	213.49	104.4145	0.272687	6.43
1987	2.255844	1.39089	0.027291	0.621839	151.03	90.65233	0.245041	-23.19
1988	2.250571	1.420976	0.006486	0.325925	182.155	81.37736	0.253341	-19.35
1989	2.260671	1.328194	0.00512	0.29216	249.535	72.78716	0.214796	-19.8
1990	2.240985	1.427239	0.005135	0.43296	215.38	71.05059	0.225517	-20.3

KEY:

Com.con = Commodity Concentration
 Geo.con = Geographical Concentration
 Raw.rat = Raw Material Ratio
 Food.rat = Food ratio

RER = Real Exchange Rate
 Con.rat = Consumption Ratio
 Inst.Ind = Instability Index
 Mkt.shr = Market Share

Figure 1.3 Export Earnings Instability.

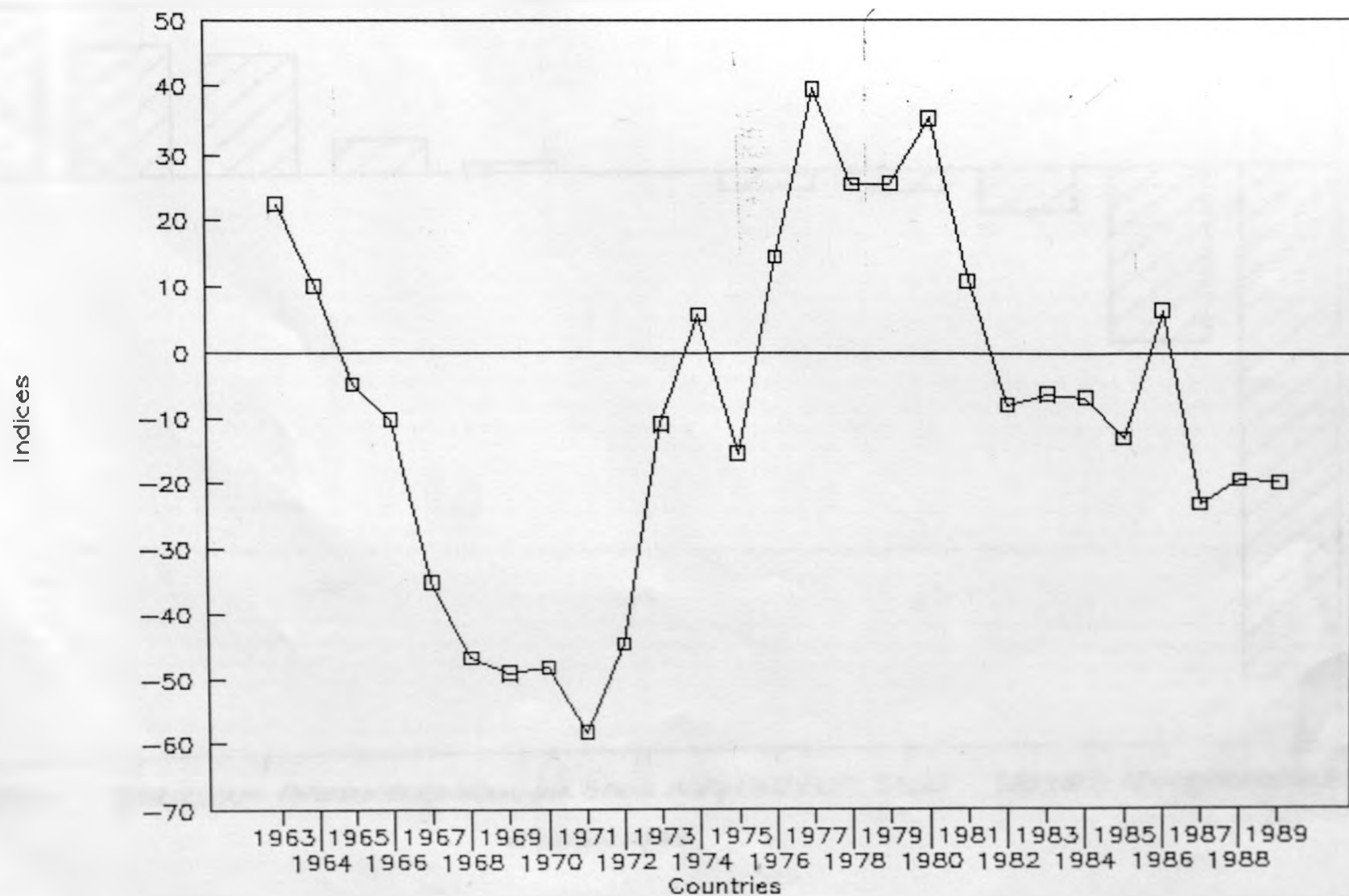


Figure 4.1 Commodity Export Instability

(INDICES)

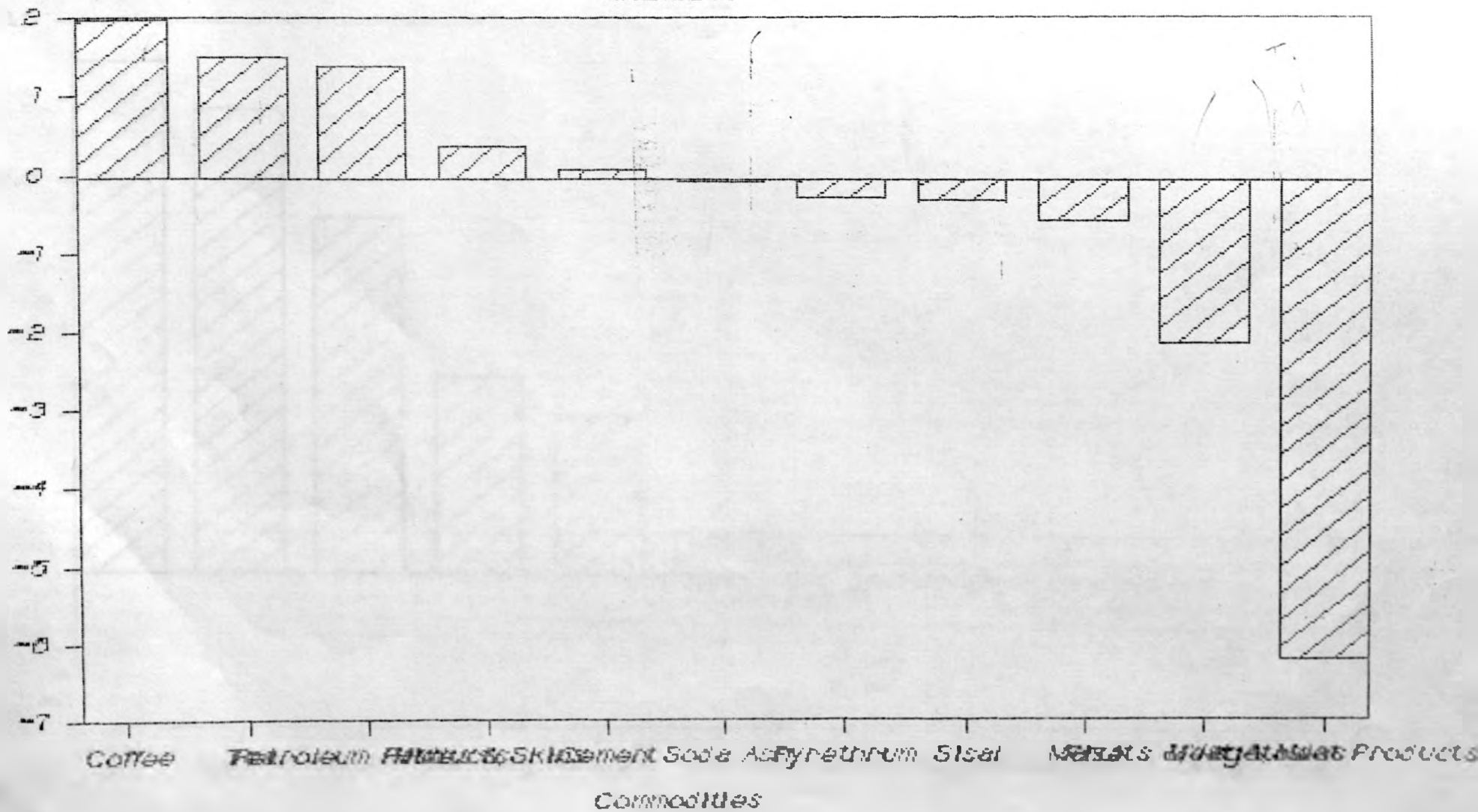


Figure 4.2 Country Export Instability.

(INDICES)

