THE CONTRIBUTION OF MAJOR EXPORT COMMODITIES OF ETHIOPIA TO THE VOLATILITY OF THE COUNTRY'S EXPORT EARNINGS

BY:

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A PROJECT SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS IN ECONOMICS WITH A FOCUS ON APPLIED TRADE POLICY ANALYSIS

May, 2009

ADDIS ABABA

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

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Acknowledgements

First and foremost I would like to honor the Almighty God for giving me the strength throughout the process of conducting this study.

My heart-felt appreciation goes to my principal supervisor, Dr. Tassewu Woldehanna. His invaluable support and encouragement has been helpful. I would also like to gratefully thank all those contributed to this study with comments and provision of input materials, including but not limited to, Mr. Sinafekeh Asrat, Dr. Derk Bienen, Dr. Mahmud Yesuf, Dr. Catherine Porter and Dr. Alemayehu Geda.

I am also grateful for the cooperation of the National Bank of Ethiopia and the Central Statistical Agency in providing me with the data needed for the analysis.

My friends and family deserve special thanks for standing by me and giving their unreserved love and support in the course of the study and write-up of the manuscript.

Thank you so much!

Acronyms

BOP	Balance of Payment
CSA	Central Statistical Agency
CV	Coefficient of Variation
DC	Developed Countries
EEA/EEPRI	Ethiopian Economic Association: Ethiopian Economic Policy Research Institute
EPRDF	Ethiopian Peoples Revolutionary Democracy Front
FTA	Free Trade Area
GDP	Gross Domestic Product
IMF	International Monetary Fund
LDC	Least Developed Country
LTI	Log Trend Index
MBI	MacBean Index
MEDaC	Ministry of Economic Development and Cooperation
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
OLS	Ordinary Least Square
RTA	Regional Trading Agreement
SSA	Sub-Saharan Africa
WTO	World Trade Organization

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The Contribution of Major Export Commodities of Ethiopia to the Volatility of the Country's Export Earnings

Fitsum Zewdu Mulugeta[1]

Abstract:

Ethiopian export, like many other developing countries, is limited to few primary products that are mainly agricultural. Studies show that such commodity concentration could result in instability of export earnings which in turn will affect growth and capital formation, since these countries highly depend on earnings from the export sector for their imports of capital and consumption goods. It is argued that volatility of such proceeds will significantly influence output by constraining input and production planning. The classical approach to measure instability and identify its causes was using a cross-country regression, which has its own limitation such as the unrealistic inherent assumption of economic similarities of the countries in the sample as well as limited use when it comes to country specific policy decisions. The present study analyzes Ethiopia's export earnings instability by employing country specific time series models which will take advantage of the sufficiently large sample period, from 1962 to 2008. The study identifies the contributions of major agricultural export commodities, namely coffee, hides and skins, oilseed and fruits and vegetables. Attempts have also been made to make comparisons between the periods of the Imperial, Derg and Post-Derg periods as these periods saw major shifts in terms of trade policies. The study finds that the post-Derg period is characterized by increase both in the instability and diversification of exports. This calls for reconsideration of policy recommendations which subscribe diversification to treat instability.

I. Introduction

1.1.Background

Like many other developing countries, Ethiopia's export is limited to few primary products, which are mainly agricultural commodities. Besides commodity, the export is also geographically concentrated into few destination countries as well. According to Abebe (1991) there has been a

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widely held view that such commodity and geographic concentrations are the major cause for volatility in the export earnings. Belay (1998) noted that the problem caused by instability of earnings from commodity export has received considerable attention, especially in the North-South dialog. According to him, instability in export earnings has been major concern for policy-makers in many developing countries.

Heavy and sudden fluctuations in quantity and price of exports could create a serious problem in balance-of-payments (BOP), national income, investment as well as the overall growth of less developed countries. The severe consequences of export instability at the various front of the economy are ratchet effect on wages and manufactured products in the industrialized countries, especially during the period after boom, and the inflationary consequences on the least developed countries (LDCs) through the higher import prices (Devkota 2004).

According to Gyimah-Brempong (1991), empirical researches on the relationship between export earnings instability and economic growth in less developed countries have yielded mixed results. Some of these studies found positive relationship while others found a negative one. There is also a third group which arrived at no significant relation to exist between export earnings instability and economic growth. These groups gave their own explanation for their respective results. The "negative impact" groups explained their findings using the uncertainties caused by the instability, which makes planning and production decisions of the export sector difficult. In addition, the instability will also constrain the country's ability to import goods that are deemed essential for the growth of the country.

On the other hand those who obtained positive relation between fluctuations of export earnings and economic growth used uncertainty itself to explain their findings. They argue that uncertainty among exporters and other beneficiaries of exports will encourage them to save more. This saving, which is made with the intention of mitigating the impacts of earnings fluctuations, will then becomes investment in the subsequent years. This in turn contributes to the growth of the economy (Gyimah-Brempong, 1991).

The present study extends the work of Belay (1998), and attempts to analyze the role of major agricultural export commodities on instability of export earnings in Ethiopia. We consider export

earnings across three different time periods, i.e. the Imperial (1962-1973), the Derg[2] (1974-1991) and post-Derg (1991-2008) periods. Inclusion of the post-Derg period will help to analyze the role of the most recent policy (regime) change on export earnings instability.

1.2.Justification

As mentioned above, volatility of export proceeds has possible negative impact on growth, though universal consensus lacks in the empirics. Hence, country specific study is necessary in order to make practical policy recommendations. The study carried out by Belay (1998) covered a period of twenty-nine years from 1962 to 1990, of which 1962-1973 is the imperial period while the remaining 1974-1990 is that of the Derg. Since the fall of the Derg in 1991, there have been major shifts in economic policies. Inclusion of the post-Derg period, 1991 to 2008 would make the picture more complete and gives better estimates by increasing the sample size to forty-five years.

Theories of international economics suggest that countries like Ethiopia have comparative advantage in production and export of commodities which are labor intensive than capital intensive. It is theoretically reasonable to expect for such countries to specialize in sectors like agriculture, one of the most labor intensive sectors in a developing country setup. Empirical results on the other hand suggest that concentrating into few export products has a danger of earnings instability. But such results are inconclusive and are based on cross-country regressions. Therefore, each developing country should study the role of commodity concentration on instability before devoting resources to policy decisions such as export diversification and fluctuation compensation. If in case concentration is not the source of instability, devoting limited resources towards diversification would not be appropriate.

On the other hand if instability is caused by commodity concentration, the nation has to find a solution to stabilize earnings (for example by diversifying export commodities and/or destination geography) since instability could have adverse effect on capital formation and economic growth.

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[2]The Derg (or Dergue) was a communist military junta that came to power in Ethiopia, following the ousting of Haile Selassie I (From Wikipedia, the free encyclopedia). This period is named after this committee that ruled the country during the years 1974 to 1991.

As economic growth is function of export and export earnings, according to some studies, and as growth is the primary challenge to countries like Ethiopia, resources should be committed to mitigate the impacts of export earnings instability in the short-run and preventing/minimizing in the long-run. For making recommendations and designing policy interventions, it is inevitable for us to identify the most important commodities in earnings instability.

1.3.Research Objective and Methodology

1.3.1. Research Objectives

The general objective of this study is to identify the contributions of major agricultural export commodities to the instability of the proceeds collected from their international trading. This will help policy-makers in making decisions regarding export diversification and their policy decisions with respect to the most unstable commodities.

Specifically the study will:

- Measure degree of instability of earnings of major agricultural commodities over the three sub-periods, imperial, Derg and post-Derg regimes as well as the over all period of the forty five years.
- Measure the relative contribution of each major agricultural export commodity to the instability.

1.3.2. Methodology

The methodology we are using to meet the above-mentioned objectives is first to identify the most appropriate instability index with respect to the three sub-periods, Imperial (1962-1974)[3], Derg (1974-1991) and post-Derg (1991-2008) periods, and the entire 1962-2008[4] period based on the available data. The analysis of these periods separately is important since they have distinct characteristics with respect to their political, economic and foreign relation policies.

[3] Even though the imperial period extends before 1962, reliable data is not available for it.

[4] This period is referred to as total period, overall period or entire period hence forth

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The other comparisons to be made are between the relative contributions of commodities in the instability. How important a commodity is to the overall instability will be assessed by comparing its share in the instability with its share in the total export earnings.

1.4.Scope and Limitations of the Study

In this thesis we used a relatively large time series data from secondary sources. Based on this we attempted to identify the stability and instability of five major export commodities, namely coffee, oilseeds, hides and skins, pulses, and fruits and vegetables. Other export commodities than the ones mentioned here are taken as one commodity by the name 'others'. This is done due to the fact that these five commodities contribute to the larger share (about 80% on average) of the export income of the country.

In doing so we ruled out the analysis for the remaining commodities. There are two reasons for doing so; one is as mentioned above, the fact that the contribution to total earnings of the 'others' is much less. And the second reason is that some immerging commodities, such as flower and *chat*[5], are not treated separately since there does not exist sufficient time series data for them to be analyzed separately. In addition, the fact that the study relies on secondary data forces us to accept the data sources as 'reliable'. Therefore, we are assuming that the data we are using is reasonably correct and the methodology with which it is gathered and compiled is appropriate, since we do not have any control over the process in which it is compiled.

1.5.Organization of the Thesis

This paper is organized as follows: The literatures reviewed are summarized in the following section. Then follows Section III, with its description of the export sector of the country. This will be followed by Section IV, which presents the analytical framework and the discussion of the main findings of the study. Finally Section V will conclude the study by summary of the main findings, conclusion, policy-implication, and listing some issues for further studies.

[5] Sometimes it is also spelled as khat

II. Literature Review

2.1.Theoretical Literature:

Adam Smith proposes that two nations trade with each other voluntarily if both nations gain. This gain is possible based on the theory of absolute advantage, i.e. one nation is more efficient than (or has absolute advantage over) another in the production of one commodity but is less efficient (or has absolute disadvantage with respect to) the other nation in producing a second commodity. If that is the case both nations gain by each specializing in the production of the commodity of its absolute advantage. This is given the assumption of a world with only two commodities and two nations (Salvatore 1998).

According to David Ricardo's law of comparative advantage, a country should specialize in the production and export of the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity in which its absolute disadvantage is greater (this is the commodity of its comparative disadvantage) than the foreign country in order for both countries to gain from trade. In this case one country could have absolute advantage in the production of both goods but it could benefit if it produce the one in which it is most efficient and import the other good from the foreign source, hence a base for trade (Salvatore 1998).

Mulugeta (2007) argues that most underdeveloped countries ought to concentrate in exporting raw materials because it is here that they have comparative advantage over developed nations. Developed nations on the other hand are apt to have greater comparative advantage in manufactured goods.

There is also another reason for developing countries to concentrate on the export of few unprocessed products, which is explained by the Heckscher-Ohlin theorem. The theorem states that a nation exports the commodity whose production requires intensive use of the nation's relatively abundant and cheep factors and imports the commodity that is produced by intensive use of a nations relatively scares and expensive factors (Salvatore 1998).

Applying the above theorem to Ethiopia, which has one of the largest populations in Africa (73,918,505 according to the 2007 national population and housing census) of which about 83.83 percent are living in rural area. This large rural population provides the 'abundant' supply of labor for the agricultural production. Since most farmers and farm workers in Ethiopia work in their own and/or their families' farm, and farm employment doesn't pay much due to the large supply of labor, it is reasonable to consider that labor is a cheep and abundant factor. According to the Heckscher-Ohlin theorem, the Ethiopian 'specialization' in exporting agricultural products and importing more capital intensive manufactured goods is in line with the theory. This is because Ethiopia is capital scarce and labor abundant and agriculture is labor intensive in developing countries unlike that of developed where it is rather capital intensive.

Accordingly less developed countries are expected to specialize in the production of more labor intensive primary products. In line with this argument Ethiopia has 'specialized' on few agricultural commodities. This commodity concentration could have consequences in terms of earnings instability as suggested by several empirical arguments.

2.2.Measurement of Export Instability:

Naya (1973) defined export earnings as the receipts of several products that the country exports. These products have a varying composition in the export of the country and may face different prices based on demand, supply and market conditions. Fluctuations in export proceeds are thus induced by changes in individual products and by the interaction of these changes. Such variations could be caused by economic, natural and other forces which could be internal or external. Some examples of such shocks are crop failure, cyclical decline in economic conditions, and changes in commercial policies.

The general agreement in defining instability is that it is the deviation of the observed outcome from its natural (expected) value. In the context of export earnings, export is expected to grow positively, negatively or stay flat following some pattern. The instability is then the deviation of the actual outcomes of the earnings from this expected pattern, commonly called the trend. To measure this fluctuation several authors developed and used different indices.

For example Cuddy and Valle (1978) argue that coefficient of variation is most common and easily interpretable measure of average variation of non-trended data series.

Massell (1970) stressed that the measure of instability chosen will be influenced by the type of trend fitted. He chose to use exponential trends due to their best fit to his data and their theoretical soundness as governments tend to plan on growth rates than level values. He specified the instability index using the formula:

$$I_m = \frac{1}{\log \bar{y}} \sqrt{\frac{\sum (\log y - \log \hat{y})^2}{N}} \qquad (2.1)$$

Where the fitted value is estimated using $\log y = a + bt + \varepsilon_t$.

Prior to this Massell used what he called the "normalized standard error" in Massell (1964), which is nothing but standard error of the unexplained variation of the linear function $y_t=a+bt+\varepsilon_t$ divided by the mean of the observations. The main difference between the two studies, Massell (1970) and Massell (1964) is the fit of exponential trend in the former and linear in the letter.

Cuddy and Valle (1978) criticizes the above approach for its *ad hoc* nature, reasonable but not founded on any clear theoretical foundation. They suggested what they called "A General Approach", which was based on the coefficient of multiple determination in order to give the approach a solid statistical foundation. After some mathematical manipulation they arrived at the following formula:

$$I_{CV} = 100\frac{SEE}{\bar{y}} = CV\sqrt{(1-R^2)\left(\frac{N-1}{N-k}\right)} \qquad (2.2)$$

Where $SEE^2 = \frac{\sum (y-\hat{y})^2}{N-k}$ is the sum of squares of deviation of the estimated from the actual value, and k being the number of independent explanatory variables, including the constant, in the

model. I_{CV} is a corrected coefficient of variation with lower and upper limits zero and CV respectively.

Love (1985) measured instability as the percentage deviation of export earnings from its trend, which could be expressed as:

$$u_t = \frac{\left(x_t - \bar{x}_t\right)}{\bar{x}_t} \tag{2.3}$$

Where x_t is total earnings and $\bar{x}_t$ is the trend value. The choice of the appropriate trend correction is central for the estimation of u_t. Among the available choices of trend are linear, moving average and exponential[6].

Glezakos (1973), Savvides (1984) and Glezakos (1984) used the arithmetic mean of the absolute value of the yearly changes in a time series corrected for the trend and expressed as percentage of the average of all observations. The above definition is expressed symbolically as:

$$I_G = \frac{100}{\bar{y}} \frac{\sum_{t=2}^{N} | y_t - y_{t-1} - b |}{N-1} \tag{2.4}$$

Where, b is the slope of the linear trend $y_t = a + bt$ fitted by ordinary least square (OLS) method. The logical economic explanation of this index is that part of the change in earnings could be expected on the basis of the positive or negative trend experienced in the past while the remaining part, $|y_t - y_{t-1} - b|$, being the unexpected change.

The methods used by Murray (1978) to measure instability were MacBean Index (MBI) and the Log Trend Index (LTI). The MBI measures deviations from a 5-year moving average of the observed values having the form:

[6] The preference of the study was the moving average as it is assumed to be more likely by the author.

$$MBI = \left(\frac{100}{n-4}\right)\sum_{t=3}^{n-2}\left(\left|x_t - MA_t\right| / MA_t\right) \qquad (2.5)$$

Where, MA_t is the five year moving average of the earnings, x_t. The LTI, which measures deviation from a constant growth rate trend line, has the form:

$$LTI = \left(\frac{1}{n}\right)\sum_{t=1}^{n}\left(x_t - ae^{bt}\right)^2 \times 100 / \bar{x} \qquad (2.6)$$

Where, a and b are estimates derived from the least square fitting of $\log x_t = \log a + bt + \varepsilon_t$ and x_t is the export proceed.

Belay (1998) used the average absolute deviation instability index, having the form:

$$AAD = \frac{100}{n}\frac{\sum_{t=1}^{n}\left|x_t - \hat{x}_t\right|}{\hat{x}_t} \qquad (2.7)$$

The above review of the different specifications of the instability indices shows that the central agreement rests on the need to eliminate the trend from the series. Other than this, researchers used different approaches and explanations for their choice of a particular specification and method of eliminating the trend. For the purpose of this study we adapted a version of (2.7) as specified by:

$$I = 100 \times \sum_{t=1}^{T}\frac{\left|x_t - \hat{x}_t\right|}{\hat{x}_t} \qquad (2.8)$$

With x_t being the export earning in year $t = 1,2,...,T$ and $\hat{x}_t$ being the estimated trend value of earnings, estimated by regressing either the level or the logarithm of the earnings on year (the time variable) using ordinary least square (OLS).

2.3.Empirical Literature:

Several studies have been conducted regarding export earnings instability by sampling both developed and developing countries, and an attempt had been made to review their methodology and main findings. Below are the summary of these studies.

Abebe (1991) based on a sample of twenty-nine African countries over the period 1960-1982 tried to assess the relation of commodity concentration and export earnings fluctuation. He measured commodity concentration by computing Gini-Hirschman[7] index and instability by deviation from exponential trend. The author regressed the instability index on the index of concentration (among other variables) to identify the effect of concentration on fluctuations of export earnings. His results showed that major export commodities contribute to the instability of earnings disproportionately (more than proportionately to be exact) in seventeen of the twenty-nine countries in the sample. On the remaining twelve, no strong association was found between concentration and instability of export proceeds.

The study by Murray (1978) analyzed instability of export earnings with the objective of examining the patterns of instability in export prices and volumes, and the relative importance of supply and demand fluctuations in determining earnings instability. The study employed computation of two types of indices, MacBean Index (MBI) and Log Trend Index (LTI). It considered a large number of countries from both developed and underdeveloped over the period 1952-1971. The results showed that instability of export earnings, prices and quantities are higher for underdeveloped countries than developed. The findings also showed that earnings instability in the case of developing countries is strongly associated with quantity instability than price.

Belay (1998) also analyzed the contributions of agricultural commodities on the Ethiopian export earnings fluctuation using a twenty-nine years of time series data covering the period 1962 to 1990. Analysis was also conducted by grouping the period into two, 1962-1973 and 1974-1990, representing the imperial and the Derg period respectively.

[7] An index to measure the degree of commodity concentration

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Belay (1998) used different statistical abstracts published by the central statistical agency (CSA) of Ethiopia to obtain the data. The major agricultural commodities the study considered were coffee, hides and skin, vegetables and fruits, and oilseeds. The index calculation method used by Belay (1998) is absolute deviation instability index. This measure is a better measure in that it does not impose appriori the same trend form. That is, it is possible to use the best trend (linear or exponential) for each period and commodity group respectively in calculating instability indices.

Inspection of instability indices for the two periods (1962-1973 and 1974-1990) showed that instability in earnings from major agricultural commodities, with the exception of hides and skins, has increased in the second sub-period. The indices computed for the entire period, 1962-1990, were between those computed for the two periods separately.

The statistical results of Belay (1998) are as follows. Hides and skins, and coffee contributed to the instability less than their share in the total export earnings. On the other hand the contribution of vegetables and fruits, and oilseeds to the instability were greater than their share in total export proceeds. In analyzing the contribution of price and quantity fluctuations on the instability of export revenue, the study found that with the exception of coffee, fluctuations in export quantities were the dominant causes of instability in export earnings. This means that the supply factors are more important in causing the fluctuations of the proceeds. The study tried to explain this by the fact that, Ethiopia heavily depends on few agricultural products for its export earnings and agricultural products in turn heavily depend on weather conditions. Another supply factor is domestic consumption. In the case of coffee, whose fluctuation has significant impact due to its share in total export earnings, it suffers wide fluctuation in earnings owing mostly to instability in the world market price where Ethiopia has no control.

Massell (1964) used a sample of thirty-six countries when estimating his linear regression model in which export instability, the dependent variable, was function of commodity concentration and geographic concentration of exports. The standard errors of the residual of the trend equation and average annual percentage rate of change in value of export were used as two separate indices of export earnings instability. The results gave significant results for both commodity and geographic concentration of exports. Regarding the sign, the former was positively related to instability while the latter being negatively, in the case of both indices. The study suggested the

insulating effect of strong bilateral trade relations for the negative sign of geographic concentration on instability.

In another, more extensive study of fifty-five countries over the period 1950-66, Massell (1970) fit exponential model to control for trend effects on instability. Here again used the standard error of the residual as index of instability. The cross-country regression gave significant result for commodity concentration and food share of exports in explaining instability in earnings of export. The second model estimated was the same model after deleting geographic concentration, per capital income, export market share and raw material share. The second estimation resulted in the improvement of the power of the model (R^2) and the significance of the variables; concentration index, food ratio of export and value of total export. In both estimations commodity concentration was positive while food ratio and export volume were negative in terms of their direction of impact on instability of proceeds.

According to Love (1985), the typical statistical techniques used for the investigation of causes of export earnings instability were cross-country regressions. These regressions used some measure of instability as dependent variables and tried to explain it with structural variables such as commodity and geographic concentration, share of raw materials, food and manufactures in total export and the domestic consumption ratio (see Massell (1964) and Massell (1970) for instance). The empirical results obtained from such models were found to be insignificant. Love (1985) explained the causes of this limited power of explanation of these typical models as being untenable inherent assumptions of cross-country regressions, i.e. the assumption of single, unique relationship between a given explanatory variable and the degree of instability. Another possible cause of insignificant results form the model is the use of different method of estimating the dependent and the explanatory variables, by mixing cross section with time series.

Love (1985) based on the distinction between external and internal causes of instability, used country specific time-series models. Using market instability and production instability as dependent variables, he found that there is a considerable gain in the explanatory power of the new country-specific time series model as compared to the typical cross-country regressions. In nineteen out of a sample of twenty countries, the coefficient of multiple determination (R^2) was found to provide a stronger case for the new model to have a more explanatory power. The

coefficient of market condition was found to be significant for 15 of the 20 cases. It was only in the eight cases that the supply side influences were found to be significant, out of which only four were significant for both market condition as well as supply/production condition simultaneously.

When we come to the studies, which analyzed the role of instability on economic growth, we find Gyimah-Brempong (1991) making Sub-Saharan Africa (SSA) the center of attention. According to the study, SSA countries have relatively homogeneous economies, hence expected similar responses to volatility of earnings from export[8]. The analysis tried to identify the impact of earnings instability on growth over the period 1960 to 1986. The study used specification and estimation of a more general form of neoclassical growth models in which earnings instability was included as explanatory variable using several instability indices. The main finding of this study was that the instability indices had significant and negative impact on growth rate, and the significant improvement of the neoclassical growth model's explanatory power (adjusted R^2) when including the indices into the model.

Naya (1973), on his study of fluctuations in export earnings and economic patterns of Asian countries, employed the standard error of the residual term of the exponential growth model of export proceeds as instability index. The results confirmed with the findings by Murray (1978), i.e. the average instability index of LDCs are greater than that of DCs. The regression results showed that large exporters tend to have relatively stable earnings and countries with much of their exports directed to neighboring countries faced higher instability. The latter finding has strong negative implication on regional economic integration.

Akpokodje (2000) analyzed the case of Nigeria to study the impact of export earnings fluctuation on capital formation, Inline with the above studies; instability index was constructed and used as explanatory variable in a model where logarithm of chang in capital stock was the dependent one. This index was calculated using standard normalization combined with moving average approach. Using data from international publications by International Monetary Fund (IMF) and World Bank, the study tried to answer the effect of export earnings instability on capital

8 This is one of the points that Love(1985) criticized cross-country regressions on

formation. The short run models confirmed the hypotheses that export earnings instability and logarithm of changes in capital stock are significantly and inversely related.

Sinha (1999) looked at the relationship between export stability, investment and economic growth in nine Asian countries using time series data. The study particularly paid attention to stationarity and cointegration issues, on which previous time series studies in this area have not. The study found that, in most cases, the variables are non-stationary in their levels and not cointegrated. These results raise serious doubts about the results of the previous studies. The results are not uniform across countries; casting doubts about the validity of the numerous cross-section studies. For Japan, Malaysia, Philippines and Sri Lanka, it was found that a negative relationship between export instability and economic growth to exist. For (South) Korea, Myanmar, Pakistan and Thailand, a positive relationship between the two variables was found. For India, the results were mixed.

Glezakos (1973) used instability index computed as the arithmetic mean of the absolute value of the yearly changes in a time series corrected for trend and expressed as a percentage of the average of all observations. The study covered the period 1953-66 and both less developed countries (LDCs) as well as developed ones (DCs) were included in the sample. Basically the study used a cross-country regression but relied on time series analysis to compute the indices. One of the findings of the study was that the average export earnings instability for LDCs was twice as much as that of DCs.

The regression results of income growth rate on export instability showed that instability to have a significantly negative impact on real per capital income growth rate in the case of LDCs. The results also convincingly confirmed the a priori criteria that export instability is harmful only to the economic growth of LDCs than DCs. It was also found that the average instability indices for both volume and price of exports of LDCs were more than the size of the respective average indexes of DCs. On the average, export volume instability was higher than that of price in both DC and LDC cases. The regressions showed that the effect of export quantity instability to negatively affect income and export growth rate, despite, being insignificant. This suggest that price instabilities to act more seriously in deterring export and income growth than volume instability in LDCs, which is in contrast with Murray (1978) and Belay (1998) who found

instability of export earnings of LDCs to be affected more by volume instability than that of price.

Savvides (1984) tried to test Glezakos's (1973) hypothesis that export instability is a factor detrimental to the growth of LDCs. The study used identical method of estimation as Glezakos (1973) by extending the study to take account of recent data, 1967-77. Six countries out of the Glezakos's (1973) sample were excluded since it was no longer appropriate to classify them as less developed. The surprising finding was that the cross-section regressions do not confirm the hypothesis in question; in fact these results directly contradicted that of Glezakos (1973) given the application of identical technique in both cases. The researcher suggested omission of important variables, measurement errors and endogenity of export instability and growth as possible cause for the contradicting results of the two studies.

In another study published in 1984, Constantine Glezakos, (Glezakos 1984) agrees with Savvies's remark on the insufficiency of single equation cross-country models. The first critique this study identified on Savvies's (1984) was that the relatively high per capital growth rate, despite the economic downturn of the early 1970s following the first oil shock. Another point of critique was the trend elimination technique. The study argues that the data 1953-66 exhibited either a liner or no trend in export proceeds while that of 1967-77 showed exponential trends. Savvides (1984) ignored this fact in order to make his analysis using identical method like that of Glezakos (1973). The Glezakos (1984) regressions were run by giving considerations for the above critiques, after correcting per capital incomes and choosing the 'best' index, linear or exponential based on goodness of fit. Export instability is still shown to have a significant negative impact on income growth of LDCs like that of Glezakos (1973). It was also found that export growth is more significant factor in determining the income growth of LDCs than DCs based on the regression coefficients, which is in direct contrast with Savvides's (1984).

The literatures above show that countries like Ethiopia have comparative advantage in production and export of commodities which are labor intensive than capital intensive. It is theoretically reasonable to expect for such countries to specialize in sectors like agriculture, one of the most labor intensive sectors in a developing country context. Empirical results on the other hand suggest that export concentration on few products has a danger of earnings instability. But this

result is inconclusive for all developing counties. Therefore, each developing country should study the impact of commodity concentration on instability before engaging in policy-making regarding export diversification or fluctuation mitigation. If concentration is not the source of instability, devoting limited resources for it would not be appropriate. On the other hand if instability is caused by commodity concentration, then nations have to find a solution to stabilize earnings.

As can be noted from above, most of studies employed cross-country regressions to address the issue. And the only country specific study done on Ethiopia is that of Belay (1998). This shows that most of the studies in the literature are note useable when it comes to advising policy formulation specifically for Ethiopia. In addition the one close to appropriate is that of Belay (1998), studied the twenty-nine years before 1991, which is fare to say outdated. The knowledge gap this study is anticipating to fill is to analyze the issue using more comprehensive dataset of forty-five years and to analyze the situation at present in order to inform present policy-makers where we stand with regard to the research question.

III. Performance of the Ethiopian Export Sector

3.1. Data

The data on export earnings, price and quantity of Ethiopia used in this study is gathered from various issues of the annual reports of the National Bank of Ethiopia (NBE). In most cases the original source of these data is Ethiopian Customs Authority. The period under consideration is between the years 1963 to 2008[9], covering a period of about 45 years. Of the forty-five years under consideration, the years 1963 to 1974 were under the rule of the imperial period of Hailesilasie I[10] followed by the period 1974 to 1991,which is the period of the Derg[11] while the remaining period of 1991 to 2008 is the post-Derg[12] period.

[9] For the purpose of the descriptive statistics we used the period 1963 to 2007

[10] Emperor Hailesilasie I ruled Ethiopia from 1930 to 1974 (Beharu 2002). The imperial rule was then replaced by the military council of Derg, which over throw the king in a military coup.

The first annual report of NBE was published in 1964 with data from the year 1963 where detailed export earnings was reported only for coffee, hides and skins, oilseeds and pulses. The remaining components of Ethiopian export commodities were reported in aggregate form as 'all others'. Since the data for the years 1964 to 1970 was reported in the Gregorian calendar, we took the average of the two consecutive years to make it compatible with the rest of the series, which is in Ethiopian/Julian calendar[13].

Several issues of Ethiopian Statistical Abstracts of the Central Statistical Agency (CSA) are used to obtain data on Gross Domestic Product (GDP) at current market prices to represent national production, gross capital formation (investment) and forecasts of population size. Such data is available since 1961 as the publication of these abstracts has started in 1963.

3.2.Performance of the Export Sector During the Imperial Period

According to Berhanu (2005), this period is characterized by relatively free market oriented policies with the private, mainly foreign capital, taking the lion's share of both import and export trade. The dominant trade strategy of the time was import substitution even though export diversification was explicitly stated on the First-Five-Year Development plan.

The trend of export earnings in the imperial period is increasing in general, with some fluctuations hear and there. Coffee takes the lion's share of the earnings as can be seen from the graph in fig. 3.1. The remaining three, oilseed, hides and skins and pulses, share more or less the same trend; with hides and skins falling and pulsed rising towards the end of the sub-period.

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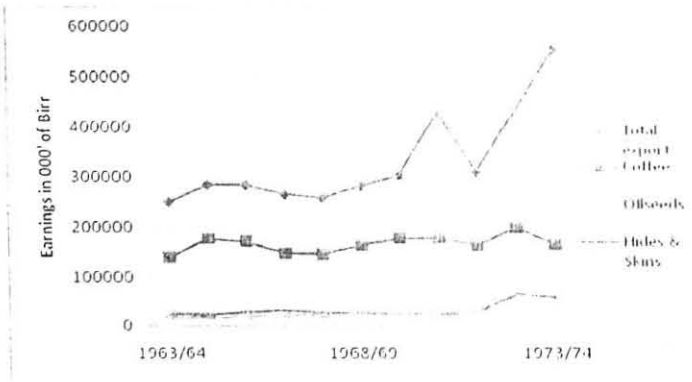
[11] Derg, which means a committee in Ge'ez, is the name of the council which took over King Hailesilasie I under the leadership of the Mengistu Hailemariam.

[12] Derg itself was also forced out of power by the military struggle of the current government, Ethiopian Peoples Revolutionary Democracy Front (EPRDF).

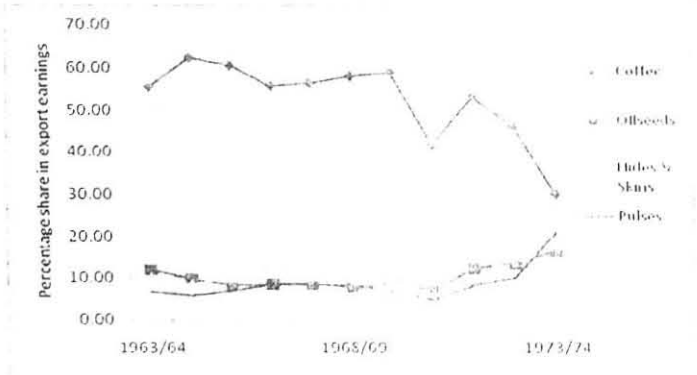
[13] In this calendar a year starts on September 11 (and 12 in every leap year) and the Ethiopian fiscal year starts on 8th of July.

Fig. 3.1: Trend of export earning and share in earnings by commodity during 1963-74

(a) Earnings



(b) Share in earnings



Source: Based on NBE data

The shares of these major export commodities in earnings is dominated by coffee, which declined towards the end of the sub-period (panel (b) of fig. 3.1) while that of total proceeds from export of coffee increased sharply (panel a) during the same time period. On the other hand, the other commodities experienced a rise in their share with the exception of hides and skins. These three commodities have a more stable trend in their levels in panel (a) of fig. 3.1 while their share suffered fluctuations from time to time (panel (b) of fig. 3.1). Coffee on the other hand suffered from fluctuation in this period both in share and earnings, its share declined in general but with fluctuations *within* the period.

Table 3.1: Growth rates of export proceeds by commodity over the imperial period

Year in G.C.	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74
Year in E.C.	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Coffee	27.54	-3.03	-14.20	-0.81	11.86	8.55	1.13	-8.30	21.50	-16.98
Oilseeds	-7.89	-14.91	-4.72	-0.68	1.13	15.59	18.18	24.80	53.02	55.89
Hides & Skins	-4.00	28.84	10.64	-16.49	-1.10	-0.77	-9.67	23.63	123.18	-12.50
Pulses	-4.96	22.45	14.14	-4.50	8.25	-12.77	-0.09	27.81	68.49	169.62
Others	-0.44	-3.16	1.80	5.12	8.88	11.88	-84.55	-29.97	-35.79	1583.23
Total	13.55	-0.19	-6.65	-2.14	8.80	7.02	42.53	-27.92	39.89	27.81

Source: Computed based on NBE data

The growth rates of export earnings of the country as well as earnings from the individual export commodities show that the growth has suffered from fluctuations indicated by the positive and negative signs of these rates. Negative growth rates indicate decline in earnings as compared to its previous year, while the positive ones showing increase in earnings, even though these increases are not uniform or constant. This means that there was fluctuation even in the growth rates of the proceeds.

3.3.Performance of the Export Sector During the Derg Period

Alemayehu (2007) outlined the economic characteristics of the period 1974-1991, which we termed as the Derg period, as:

- Strengthening the state's role in external trade by attempting to control participation of private capital in the sector
- Close monitoring of price, quantity and distribution of goods
- Especial emphasis was given to external trade sectors deemed essential for economic growth and in the trading of medical equipment and goods that ensure the health and security of the population

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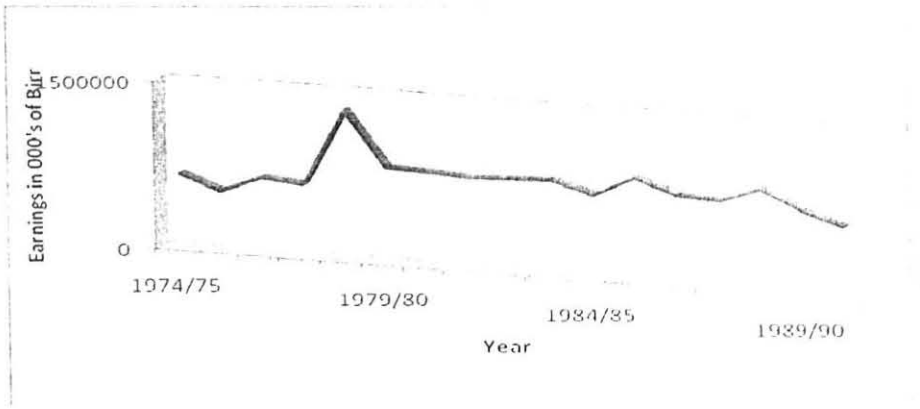
- Diversification attempts were also made in terms of commodity and destination of exports, especially to divert trade form capitalist to socialist partners.

The openness index[14] as defined by the ratio of exports to gross domestic product[15] (GDP) is found to be 10.36% on the average for the years 1974 to 1991. On the other hand the share of imports in Ethiopian GDP averages at 16.94%[16] for the same period. This indicates that the country's trade is running in deficit with the export earnings being unable to cover the country's import requirements.

Fig. 3.2: Trend of export earnings in the Derg period



Source: Own computation based on NBE data.

During the Derg period the earnings form export remained more or less between 500 million and a billion Birr. The average share of major agricultural products, namely coffee, hides and skin, fruits and vegetable, pulses, and oilseeds for this period was standing at 82.46%.

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[14] Openness index is calculated using $OI_t = \frac{x_t}{GDP_t}$ where x_t is the export earnings in year t.

[15] GDP used for this computation is based on GDP at current prices reported by MEDaC/MoFED and published by CSA on its annual statistical abstracts.

[16] Import data is obtained from the 2007 Database of the Ethiopian Economic Association/Ethiopian Economic Policy Research Institute (EEA/EEPRI)

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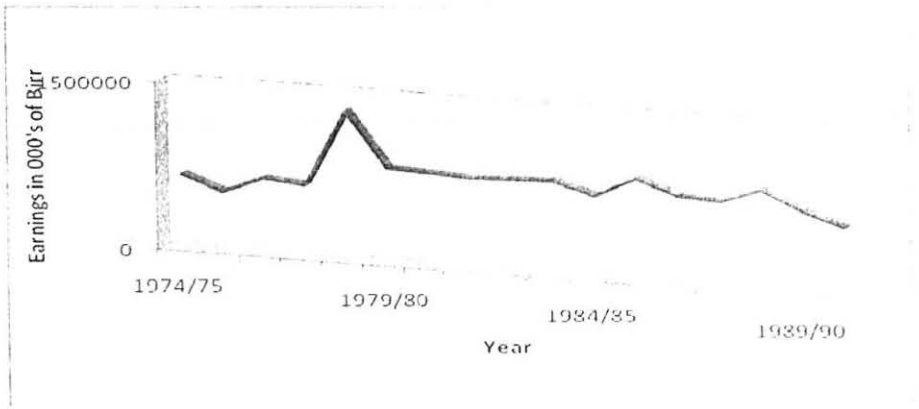

Source: Own computation based on NBE data.

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In this period coffee alone took 61.47% of the earnings followed by hides and skin with 11.87%, fruits and vegetables with 0.98%, pulses with 3.87% and oilseeds with 2.89%. As can be seen from the average percentage share of these commodities, agriculture constitutes most part of the countries export earnings.

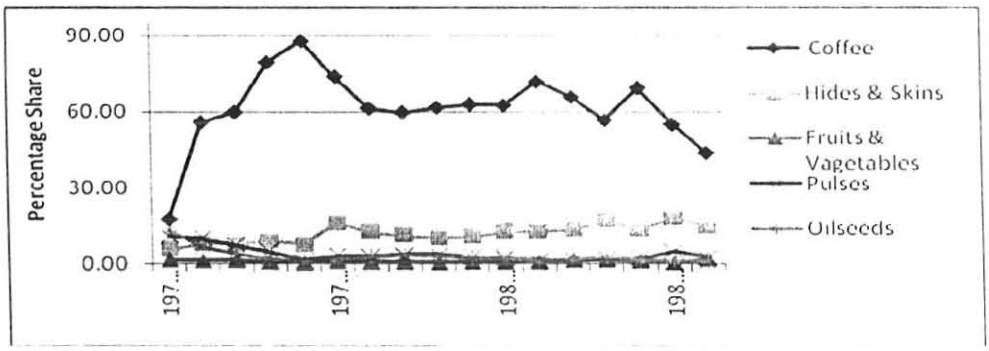
Table 3.2: Percentage share of agricultural products in total export earnings in the Derg period (1974 to 1990)

	Average share	Minimum	Maximum	S.D. of shares
Coffee	61.47	17.51	87.90	15.26
Hides & Skins	11.87	5.55	18.19	3.60
Fruits & Vegetables	0.98	0.20	1.95	0.47
Pulses	3.87	1.07	10.96	2.90
Oilseeds	2.89	0.59	13.23	3.05
Live Animals	2.35	0.00	7.62	2.30
Chat	1.60	0.49	3.61	1.16

Source: Own computation based on NBE data

The pattern of the shares in earnings of the major export commodities of the country remained being dominated by coffee in the Derg period as well. The share of coffee started to rise from its decline towards the end of the imperial period and suffered several mild ups and downs during the course of the Derg period.

Fig. 3.3: Share of the major agricultural commodities in export earnings



Source: Own computation based on NBE data

3.4.Performance of the Export Sector During the Post-Derg Period

Following the fall of the Derg the objectives of the government changed towards ensuring participation of the private sector, promoting export by providing incentives, replacing quantitative trade restrictions with *ad valorem* rates, increase diversification, minimize illicit trade and restructuring state owned trade enterprises (Alemaychu 2007).

According to Alemayahu (2007) and the Ethiopian investment and licensing policies and procedures of the Ethiopian Investment Agency, government took the following measures to meet the above objectives:

- Liberalize the foreign exchange market into an auction system between banks, in order to provide foreign currency for both public and private sectors
- Devaluation of the Birr in order to make Ethiopian products cheaper in the world market versus the products of the rest of the world
- Simplification of licensing procedure
- Supportive services to private exporters were designed in areas of transport, package training, overseas market research, etc.
- Introduction of simple tariff structure and foreign exchange retention schemes

According to the present study, the Post-Derg period covers the period 1991 to 2008. In this period the five major export commodities, coffee, hides and skins, fruits and vegetable, oilseeds and pulses, account for about 71.91% on average. The one product which gained importance in terms of average share in earnings, as compared to the previous two periods, is *chat* with share of 0.84%, 1.78% and 9.26% in the imperial, Derg and post-Derg periods respectively.

With the exception of *chat* and oilseeds, all the other commodities listed on Table 3.3 experienced declined from their relative share in the Derg period, as compared to their shares in the post-Derg period. This could be an indicator for either shrink in volume and/or price of the commodities, or diversification away from these commodities.

$$I_t = 100 \times \frac{\left| x_t - \hat{x}_t \right|}{\hat{x}_t} \qquad (4.1)$$

Where x_t is the actual export earnings from time t, $\hat{x}_t$ is the trend value of earnings and I_t being the value of the instability index for time t. In this study equation (4.1) is estimated using the regression of export earnings on time, as specified by (4.2) and (4.3) below[18], to define the trend growth of export earnings.

$$x_t = \alpha + \beta t + \varepsilon_t \qquad (4.2)$$

Or

$$\log x_t = \log \alpha + \beta t + \varepsilon_t \qquad (4.3)$$

Where x_t is the export earnings, t being the time variable and ε_t is the stochastic error term.

We made the choice between the linear and the exponential models of (4.2) and (4.3) using the regression specification test (RESET)[19], adapted from Wooldridge (2000). We first estimated (4.2) and (4.3) to obtain $\hat{x}$ and $\log \hat{x}$. Then we computed their difference

$$d_1 = \hat{x} - e^{\log \hat{x}} \qquad (4.4)$$

and

$$d_2 = \log(\hat{x}) - \log \hat{x} \qquad (4.5)$$

Then we estimated:

---

[18] Please see the annex for estimated results

[19] Davidson and MacKinnon called this method the J-tset as it estimates β and δ or γ (for (4.6) or (4.7) respectively)*jointly* (Maddala 1992)

$$x_t = \alpha + \beta.t + \delta.d_1 + \varepsilon_t \quad (4.6)$$

$$\log x_t = \log \alpha + \beta.t + \gamma.d_2 + \varepsilon_t \quad (4.7)$$

If we accept the hypothesis of $\delta = 0$ from equation (4.6), then we chose the linear model. On the other hand the acceptance of the hypothesis $\gamma = 0$ from (4.7) will accept the exponential model. In the cases where both models are acceptable, we choose the one with the highest power of acceptance. Significance of the trend is also considered as a criterion of choosing a model in the event when both specifications are acceptable. In the few cases where both models were rejected by the RESET test, we base our choice on significance of the trend and graphical inspection of the earnings.

In case of the overall period, from 1963 to 2008, all the models[20] with the exception of the one for oilseeds and pulses turned out to be best fitted by the exponential trend of equation (4.3). The models for total earnings, fruits and vegetable, and other exports were chosen by graphical inspection of the trends. Those earnings that increase at a faster rate over time are fitted using exponential trend. To avoid the bias of using linear and logarithmic scales, we transformed the estimates from the linear model by taking their natural logarithm in all cases of our analysis.

During the imperial sub-period, the exponential model performed well in representing the data, with the exception of the case for pulses. The exceptions from exponential trend during the Derg period are total earnings, coffee and hides and skins.

When it comes to the Post-Derg period, linear trend dominates exponential with the exception of the case for oilseeds and pulses.

Following the fitting of the appropriate trend for each time period, we computed shares of each agricultural commodity in the instability. The first step is to summarize the instability indices by commodity, using arithmetic mean of the index computed using (4.1):

[20] Model for total export earnings, earnings from Coffee, Oilseeds, Hides and Skins, Pulses, Fruits and Vegetables, and Other exports

When we take a look at the contribution of the major export commodities of the entire period of 1963-2008, we find that coffee, and hides and skins contribute less (45.74% and 7.17% respectively) to the instability than their shares in export earnings, which on average stood at 54.52% and 10.98% respectively. The remaining, oilseeds, pulses, and fruits and vegetables contribute 9.53%, 7.02% and 4.45% respectively to the instability, which are more than their respective average shares in export proceeds of 6.56%, 4.91% and 2.01%. These findings are similar with that of Belay (1998) with the exception of the case of pulses, even though his study does not include the post-Derg period.

In the imperial period it was only coffee and hides and skins which contributed less in the instability than their share in earnings. Coffee contributed only 16.94% while its average share for the period was 52.53%. The contribution of hides and skins[21] to the instability was 9.78% while its share in earnings was 10.06. Out of the eleven years covered for this period, only four observations were found for fruits and vegetable, therefore it is left out of our analysis for this period. For the remaining products, oilseeds, and pulses, the contributions to instability were 12.54% and 15.81% respectively while their respective contribution to the total export earnings was 10.19% and 8.56%, which again is inline with the findings of Belay (1998).

In the Derg period; coffee and hides and skins were stable, once again, in terms of their contribution to the instability as compared to their export share (53.97% versus 61.47% for coffee, and 10.26% versus 11.87% for hides and skins). The remaining commodities contributed more to the instability than what they contributed to the proceeds of exports. Coffee in our case has a stabilizing impact (since its share in instability is less than its share in earnings) in contrast with that of Belay (1998) that found proportional contribution of coffee in the instability to be almost equal to its share in earnings. The particular interest on this commodity is due to its major share in earnings. Its stability will have a strong implication for the mitigation of instabilities of many commodities and its slight instability is likely to cause major distortion in the export earnings due to the fact that it is a big player in the export sector of the country.

[21] For the case of hides and skins the share in earnings is only marginally greater than the share in the instability.

Table 4.1: Estimation Results for Instability Indices

	Total 1963-1991			Imperial 1963-1974			Derg 1974-1991			Post Derg 1991-2008[22]		
	Instability index	Share in instability	Share in earnings	Instability index	Share in instability	Share in earnings	Instability index	Share in instability	Share in earnings	Instability index	Share in instability	Share in earnings
Coffee	2.64	45.74	54.52	0.66	16.94	52.53	2.56	53.97	61.47	3.11	42.31	48.87
Oilseeds	4.58	9.53	6.56	2.53	12.54	10.19	4.24	4.19	2.89	7.67	16.88	7.90
Hides and Skins	2.06	7.17	10.98	2.00	9.78	10.06	2.52	10.26	11.87	2.67	7.96	10.68
Pulses	4.51	7.02	4.91	3.80	15.81	8.56	2.99	3.96	3.87	7.34	7.33	3.58
Fruits and Vegetables	7.00	4.45	2.01	7.48	34.69	9.55	3.90	1.31	0.98	2.77	0.97	1.26
Others	3.86	26.09	21.33	1.39	10.24	15.19	4.06	26.31	18.93	3.18	24.55	27.71
Total[23]	2.16			1.00			2.26			3.24		

Source: Own analysis based on NBE data

[22] The estimation for this period is based on fitting of linear trend

[23] This index stand for the instability index of the total export earnings computed using (4.8)

The post-Derg period is facing higher shares of coffee, hides and skins, and fruits and vegetable in earnings as compared to their share in causing the instability. The shares in earnings of these commodities are 48.87%, 10.68% and 1.26%, while their shares in the fluctuation are 42.31%, 7.96% and 0.97% respectively. During the same period oilseeds and pulses contributed more to the instability than they do to the proceeds from their export.

In summary coffee and hides and skins consistently contributed to the stability of the earnings in all the four cases, the entire period, imperial, Derg and post-Derg periods. Oilseeds and pulses mostly contributed to the instability more than what they are contributing to the earnings while fruits and vegetables marginally improve in the case of the post-Derg period.

Table 4.2 below shows the total instability index and the weighted total instability index for each period. The total instability index is computed using the formula (4.8) following the regression of the total export earnings on time and the computation of the index I_t of equation (4.1) for the total export earning. On the other hand the weighted total index is the sum of the instability indexes of the constituent commodities of the export earnings weighted by their share in the total export earnings.

The weighted total index is greater than that of the simple total index in periods. The weighted total's being greater is an expected result as it is the sum of the instability from the individual commodities. The instability index of total export earnings on the other hand does not reflect the fluctuation of individual commodities, rather the net-fluctuation of the total export earnings of the country. Since instability of one commodity could be offset by the stability of the other, the index of the total earnings is expected to be lesser than that of the weighted. In the case of Ethiopia, even if most of the commodities fluctuate more wildly, the relative stability of the major commodity, i.e. coffee, offsets the impact of the fluctuation of the total earnings.

In order to explain the higher instability index for the post-Derg period, we took a look at the difference between the share of coffee in earnings and its share in the instability over the periods under consideration. In doing so it is found that the gap between coffee's share in earnings and its share in the instability of earnings range from around 36 percentage points in the imperial era to 6.5 in the post-Derg period.

Table 4.2: Total and weighted total instability indexes

Period	Total Instability Index	Weighted Total Instability Index
Imperial	1.00	2.06
Derg	1.04	2.92
Post-Derg	3.24	3.59
Total	2.16	3.15

Source: Own computation based on NBE data

This means that the share of coffee in export proceeds was much higher than its share in the instability during the imperial period and it is the least now. Following this we can suggest that the coffee has lost its power to stabilize the volatility in earnings caused by the other commodities since it only marginally qualifies for stabilization.

According to the frame work of Abebe (1991), the instability of each export commodity is a function of its share in earnings and the correlation between the trend-corrected export earnings of the commodities. Negative correlation indicates the offsetting movements of the major (coffee in our case) and the minor (the remaining) export commodities. On the other hand positive correlations indicate that the major and the minor commodities are moving in phase, i.e. in a way that reinforces their impact on the instability.

Taking coffee as major export and the remaining as minor, we computed the correlations between the trend-corrected earnings of the major the minor commodities. The findings suggest that the movement of coffee in the three periods, over-all, imperial and Derg is offsetting. On the other hand the movement of the 'major' and the 'minor' export commodities in the period that followed the Derg is in phases as indicated by the positive correlation on Table 4.3 below.

The reason for coffee to move from its role as stabilizer of the export earnings to marginally qualify as stable could be due to the fact that its share dropped at a faster rate than its share in the

instability. One of attributes to the loss in share of the coffee is the diversification of the country's export into other products. For example flower, which was never on the list of Ethiopian export balance few years back, is gaining increasing share in the export earnings account of the country. Another immerging commodity is Chat, whose share increased from below one percent in the imperial and below 2% in the Derg to more than 9% during the post-Derg period.

In order to test the hypothesis that the post-Derg period is the most diversified than the others, we computed the Gini-Hirschman concentration index as employed by Abebe (1991), Xin and Liu (2007), Malik (2007) and others.

Table 4.3: Correlation between de-trended major and minor commodities

Period	Correlation
Total	-0.6364
Imperial	-0.3041
Derg	-0.9259
Post-Derg	0.5550

Source: Own computation on NBE data

The formula used to generate the Gini-Hirschman concentration index in above mentioned studies as well as in the present study is:

$$G_t = 100 \times \sqrt{\sum_{i=1}^{n} \left(X_{it} / X_t \right)^2} \qquad (4.11)$$

Where X_{it} represent the export earnings from commodity i in year t while X_t represent the total export proceeds of the year t. We then computed the mean values for each period to find a summary statistic that best describe the period in terms of its export diversification/concentration.

Table 4.4: Average Index of Export Concentration/Diversification

Period	Total	Imperial	Derg	Post-Derg
Gini-Hirschman index	57.29	56.69	63.34	51.62

Source: Own computation using NBE data

The likely values of this index are between 0 and 100. According to Malik (2007) the highest likely value, i.e. 100, indicates that the total agricultural exports are comprised of only one commodity. When the number, and value of goods exported increases, the value of G_i will decline. This means that when the value of G_i gets lower, it indicates that export diversification has increased.

Based on this definition, the Derg is the period where export is concentrated into fewer commodities. The imperial period is the second, following the Derg, in terms of high export commodity concentration. The post-Derg period is the least, among the three, with regard to export commodity concentration. In other words, the post-Derg period faced the highest degree of export commodity diversification as compared to the remaining two. When compared to the level of concentration over the total period, that of the imperial and post-Derg sub-periods performed better than the over all period wile that of the Derg is below the entire period. Even in some years in the Derg sub-period, the values of G_i reached as high as 88%, meaning that this much percent of the export income is generated by a single commodity.

V. Conclusion and Policy Implication

In this section we try to summarize the major findings of the study, derive some conclusions and forward some policy implications. Like in many developing countries in the Sub-Saharan Africa (SSA), the performance of the Ethiopian export sector has remained to be dominated by few agricultural commodities. These commodities remained dominant over the forty-five years covered by this study. The period between 1963 and 2008 witnessed several shifts of economic policies along with changes in political regimes. The economic policies shifted from market to

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command in 1974, which changed into mixed towards the final years of the regime and finally back to market in 1991.

This study aimed to identify the contributions of the major agricultural export commodities of the country to the fluctuations of the export earnings. The knowledge of the contribution of these commodities is expected to inform policymakers improve the quality and direction of policy interventions to be designed. We used data from the several issues of the annual reports of the National Bank of Ethiopia (NBE) to conduct our analysis.

It is found that Ethiopian export commodities are concentrated into few agricultural commodities, and coffee in particular contributes to more than half of the country's export earnings. We also found that the commodity concentration has been declining since 1991. One of the main findings of this study is that the major commodity[24], i.e. coffee, contributed to the instability in total earnings by less than it contributed to the total earnings in all periods. Even though coffee performed well with respect to the fluctuation, its share in export proceeds only marginally exceeded its share in the earnings during the post-Derg period, the period since 1991. This in other words means that coffee played a role of stabilizing the volatility of the earnings caused by the other commodities. The contribution of the remaining commodities in the instability exceeded their contribution in the export income. But coffee eventually lost this stabilizing role as time moved from the imperial to the post-Derg period.

5.1 Conclusion:

Based on our findings we conclude that the market-economy's economic policies performed well in attaining diversification, which is one of the recommended remedial of export earnings volatility, as the imperial and the post-Derg periods performed better than that of the Derg in this regard. Despite the fact that the post-Derg period is the most diversified as compared to the remaining two, it performed badly when it comes to stabilizing the fluctuations from the export income. This is in direct contradiction with the policy recommendation by most literatures to attain stability.

[24] Based on the significantly large share of coffee in the earnings of export we used the convention of classifying the country's export commodities into major (that is coffee) and minor (the remaining exports) commodities.

The source of this contradiction could be the positive correlation between the traditional exports, i.e. coffee, oilseeds, hides and skins, pulses, and fruits and vegetable, with the newly emerging export commodities, such as flower and *chat*. This means that all the major export commodities fluctuate in a similar manner, in terms of their export proceeds. This could be explained by the fact that most of these commodities are agricultural, and it is a known fact that agricultural outputs in Ethiopia are highly dependent on level of rainfall. Therefore, when output (volume) falls due to climatic conditions, earnings from export will also fall since earning is a function of both supply (volume) and price of export commodities.

The above analysis shows that for export to be stable, diversification should be directed towards commodities that could be negatively correlated with the traditional exports. In other words, diversification efforts should give attention to diversifying into non-agricultural exports, such as manufactured goods and other non-traditional commodities as hydro-electric power.

5.2 Policy Implication:

The policy lessons to be taken from this study is that diversification by itself does not solve the problem of export earnings volatility. Diversification should be a means not an end. And when diversifying, if we diversify with more unstable commodities or into commodities that fluctuate in the same direction as the traditional exports, this may result in more distortion than otherwise. The country should consider to diversifying into commodities on which it has comparative advantage and a sustainable demand. Production of commodities that have domestic demand is advantageous, especially to sustain production at early stages and motivate investors to enter that particular industry. Eventually it could increase its foreign market and grow through time.

The policy conclusion of this study is to supplement the diversification efforts of the export commodities with an effort to reduce the instability. And most importantly to diversify into sectors that do not rely on rainfall, such as manufacturing and service sectors.

Stability in earnings is a function of stability of both price and volume of exports. Since Ethiopia is a 'small open economy', which does not have influence in the world commodity price, our primary focus should be in stabilizing export volume, i.e. sustainable, weather independent production. Another risk minimizing factor is geographic diversification, which insulates the

export market from fluctuations caused by shifts and/or fluctuation in demand for our exports in a particular country or group of countries.

One additional solution to reduce the fluctuation in earnings is to enter into trading agreements (regional trading agreements (RTA), free trade areas (FTA), custom unions etc) with countries with which the country is trade compatible. This means to remove trade barriers through a mutually negotiated agreement with countries that are not producing and exporting similar products as Ethiopia. This is because trade compatible countries have demand for each others' products and the RTAs facilitate freer trade among the partners.

Joining the World Trade Organization (WTO) could also have similar advantage as a multilateral trading platform, if Ethiopia manages to negotiate and inter the organization without having to give up much of its advantages at the current status quo. But joining only is not a solution by itself; the country should be able to increase its trading partners in the WTO for its exports.

5.3 Important Issues for Further Studies:

The present study attempted to identify which and by how much important export commodities contribute to the instability. Determinants of the instability are beyond the scope of this study. Other issues such as the impacts of instability on the economic growth of the country, its capital formation and future investments, the pressure it puts on the foreign currency reserve, the nations ability to import both capital and consumption goods, etc. are left for other parallel and future studies.

References:

Abebe T. (1991), "Commodity Concentration and Export Earnings Instability: Evidence from African Countries," Center for Economic Research on Africa, Montclair State University

Akpokodje, G. (2000), "The Effect of Export Earnings Fluctuations on Capital Formation in Nigeria," African Economic Research Consortium, RP 103

Alemayehu Geda, (2007), "Readings on the Ethiopian Economy" (Department of Economics, Addis Ababa University, Unprocessed).

Bahru Zewde, (2002), "A History of Modern Ethiopia 1855-1991", James Currey Ltd, Oxford, Ohio University Press, Athens and Addis Ababa University Press, Addis Ababa.

Belay K. (1998), "Instability of Ethiopia's Export Earnings: The Contribution of Major Agricultural commodities," Ethiopian Journal of Agricultural Economics 2(1) pp. 27-54

Berhanu Lakew, (2005), "Determinants of Ethiopia's Export Performance: An Econometric Investigation", Alemayehu et. al (eds). EEA/Proceedings of the Second International Conference on Ethiopian Economy June 3-5, 2005. Ethiopia, pp 347-373

Cuddy, J.D.A. and Valle, P.A.D. (1978), "Measuring the Instability of Time Series Data" Oxford Bulletin of Economics and Statistics. 40: pp. 79-85

CSA (Central Statistical Agency). Ethiopia, Statistical Abstracts (various issues from 1963 to 2007)

CSA (2008), "Preliminary Results of the Ethiopian Population and Housing Census," unpublished

Devkota, S. C. (2004), "Causes of Export Instability in Nepal," Published on http://ideas.repec.org/p/wpa/wuwpit/0410002.html, accessed on November 19, 2009

Glezakos, C. (1973), "Export Instability and Economic Growth: A Statistical Verification," Economic Development and Cultural Change, 21(4), Part 1, pp. 670-678

Glezakos, C. (1984), "Export Instability and Economic Growth: Reply," Economic Development and Cultural Change, 32(3), pp. 615-623

Greene, W.H. (2003), "Econometric Analysis," Upper Saddle River, New Jersey, 5th edi.

Gyimah-Brempong, K. (1991), "Export Instability and Economic Growth in Sub-Saharan Africa," Economic Development and Cultural Change, 39(4) pp. 815-828

http://www.ethiomarket.com/eic/ : Ethiopian Investment Policies and Procedures, Accessed on December 5, 2009

Malik, N. (2007), "Pakistan Agricultural Export Performance in the Light of Trade Liberalization and Economic Reforms", University of Balochistan Quetta, Department of Commerce, Working paper series 2007:4

Maddala, G.S. (2005), "Introduction to Econometrics," John Willey & Sons, LTD, Singapore, 3rd edi.

Massell, B. F. (1964), "Export Concentration and Fluctuation in Export Earnings: A Cross-Section Analysis," American Economic Review, 54(2), Part 1, pp 47-63

Massell, B. F. (1970), "Export Instability and Economic Structure," American Economic Review, 60(4), pp 618-630

Mulugeta, A. (2007), "The Effect of Export Earnings Fluctuation on Economic Growth in Ethiopia," M. Sc. Theses, Addis Ababa University.

Murray, D. (1978), "Export Earnings Instability: Price, Quantity, Demand?" Economic Development and Cultural Change, 27 (1), pp. 61-73

NBE (National Bank of Ethiopia). Annual Report (various issues from 1964 to 2007)

Naya, S. (1973), "Fluctuations in Export Earnings and Economic Patterns of Asian Countries," Economic Development and Cultural Change, 21 (4), Part 1, pp 629-641

Salvatore, D. (1998), "International Economics," Prentice Hall International, Inc. 6th ed.

Savvides, A. (1984), "Export Instability and Economic Growth: Some New Evidence," Economic Development and Cultural Change, 32(3), pp. 607-614

Verbeek, M. (2002) 'A Guide to Modern Econometrics', John Wiley & Sons Ltd.

Wooldridge J.M. (2000) "Introductory Econometrics: A Modern Approach South-Western," Cincinnati.

From Wikipedia, the free encyclopedia: http://en.wikipedia.org/wiki/Derg, Accessed on April 10, 2009

Xin, X. and Liu, J. (2007), "Geographic Concentration and China's Agricultural Export Instability", Journal of World Economy, 31(2), pp. 275-285

Annex:

Model Estimation

Table A1: Estimation of equation (4.3) for the period 1962 to 2008

Commodity	Constant	Time trend (s.e)	R^2	DW	
Total	-141	0.078541*** (0.006045)††	0.8452	0.452279	(2, 45)
Coffee	-131	0.073097*** (0.005931)††	0.7923	0.573342	(2, 45)
Oilseed [Lin]	$-4.30x10^7$	21859.67** (9359.751)††	0.3637	0.1934162	(2, 45)
Hides and Skins	-145	0.079438*** (0.003533)†	0.9132	0.937731	(2, 45)
Pulses [Lin]	$-1.70x10^7$	8644.542** (3863.255)†	0.2690	0.4321956	(2, 45)
Fruits and vegetables	-139.105	0.075096*** (0.021967††	0.4505	0.599854	(2,38)
Others	-185	0.099596*** (0.00741)†	0.8265	0.825606	(2,45)

Source: Own calculation based on NBE data

[Lin] Estimated using linear trend, *10% significance level, ** 5% significance level and *** 1%. † Newy-West standard error at one period lag, †† Newy-West standard error at two periods lag and ††† Newy-West standard error at three periods lag

Table A2: Estimation of equation (4.3) for the imperial period

Commodity	Constant	Time trend (s.e)	R^2	DW	
Total	-113	0.064119*** (0.014868)	0.6739	1.727117	(2, 11)
Coffee	-20.8	0.016726* (0.00912)	0.272	2.185221	(2, 11)
Oilseed	-183	0.098622* (0.044091)†	0.521	0.395113	(2, 11)

Hides and Skins	-135	0.074227** (0.026398)‡	0.4767	1.125209	(2, 11)
Pulses [Lin]	-1.10x10^7	5623.041 (3099.235)‡	0.4108	0.9834909	(2, 11)
Fruits and vegetables	1545.459	-0.78174 (0.551481)	0.5012	2.376872	(2, 11)
Others	-110	0.061823* (0.031564)‡	0.4295	1.140354	(2, 11)

Source: Own calculation based on NBE data

[Lin] Estimated using linear trend, *10% significance level, ** 5% significance level and *** 1%. ‡ Newy-West standard error at zero lags † Newy-West standard error at one period lag, †† Newy-West standard error at two periods lag and ††† Newy-West standard error at three periods lag

Table A3: Estimation of equation (4.3) for the Derg period

Commodity	Constant	Time trend (s.e)	R^2	DW	
Total [Lin]	-2.97x10^6	1909.063 (8934.32)	0.0030	1.782843	(2, 17)
Coffee [Lin]	-1.04x10^6	784.0404 (12852.65)‡	0.0003	1.250983	(2, 17)
Oilseed	206	-0.0994*** (0.030464)‡	0.4779	0.935026	(2, 17)
Hides and Skins [Lin]	-873x10^6	4470.102*** (1320.983)†	0.5095	1.03086	(2, 17)
Pulses	160	-0.07608*** (0.023778)‡	0.4789	1.098787	(2, 17)
Fruits and vegetables	-30.59	0.019955 (0.021267)	0.0554	1.655353	(2, 17)
Others	-65	0.038809 (0.037933)‡	0.08	0.967564	(2, 17)

Source: Own calculation based on NBE data

[Lin] Estimated using linear trend, *10% significance level, ** 5% significance level and *** 1%. ‡ Newy-West standard error at zero lags † Newy-West standard error at one period lag, †† Newy-West standard error at two periods lag and ††† Newy-West standard error at three periods lag

Table A4: Estimation of equation (4.3) for the post-Derg period

Commodity	Constant	Time trend (s.e)	R^2	DW	
Total [Lin]	$-1.14x10^9$	574830.6^{***} $(90640.97)^{\dagger}$	0.7935	0.333589	(2, 17)
Coffee [Lin]	$-3.62\ x10^8$	182582.8^{***} $(42829.95)^{\dagger}$	0.5647	0.549308	(2, 17)
Oilseed	-828.52	0.4218979^{***} $(.0830241)^{\dagger}$	0.7967	0.7320737	(2, 17)
Hides and Skins [Lin]	$-7.92\ x10^7$	39971.88^{***} $(5196.692)^{\ddagger}$	0.7219	1.311108	(2, 17)
Pulses	-613.12	0.3135134^{***} $(0.0810417)^{\dagger}$	0.7001	0.6364568	(2, 17)
Fruits and vegetables [Lin]	$-1.79\ x10^7$	9040.598^{***} $(742.6772)^{\ddagger}$	0.8608	1.483796	(2, 17)
Others [Lin]	$-3.64\ x10^8$	183519.9^{***} $(19763.85)^{\ddagger}$	0.8777	1.500371	(2, 17)

Source: Own calculation based on NBE data

[Lin] Estimated using linear trend, *10% significance level, ** 5% significance level and *** 1%. [‡] Newy-West standard error at zero lags [†] Newy-West standard error at one period lag, [††] Newy-West standard error at two periods lag and [†††] Newy-West standard error at three periods lag

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university, and that all source of materials used for the thesis have been duly acknowledged.

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