

**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
FACULTY OF BUSINESS AND ECONOMICS  
DEPARTMENT OF ECONOMICS**

**THE PERFORMANCE AND DETERMINANTS OF THE ETHIOPIAN LEATHER  
EXPORT SECTOR**

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA  
UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTERS OF SCIENCE IN ECONOMIC POLICY ANALYSIS

**BY  
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**2002  
Addis Ababa**

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## **Acknowledgment**

First of all I would like to acknowledge my advisor, Dr. Getachew Asgedom, for his guidance and comments. I would also like to extend my gratitude to the African Economic Research Consortium (AERC) and the Ministry of Finance and Economic Development (MoFED) both of which sponsored my postgraduate studies. I would also like to thank Ato Shewaye Tesfaye from whom I benefited much comments and reflections. Finally, I sincerely thank my parents, colleagues and friends who extended their moral and material support throughout my studies.

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## **Acronyms**

AAAO	Addis Ababa Abattoir organization
ADF	Augumented Dickey-Fuller
ADL	Auto regressive distributed lag
ARCH	Autoregressive conditional hetroscedasticity
CFC	Common fund for commodity
CSA	Central Statistics Authority
DF	Dickey-Fuller
DW	Durbin-Watson
ECM	Error correction model
EEA	Ethiopia Economic Association
EEPA	Ethiopia Export Promotion Agency
EG	Engle-Granger
EQS	Ethiopia Quality standard
EQSA	Ethiopia Quality Standard Authority
ETA	Ethiopia Tanners Association
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
HSMC	Hides & Skins Marketing Authority
LLPTDI	Leather and leather products technology development institution
LMA	Livestock Marketing Authority
LMB	Livestock and Meat Board
MOA	Ministry of Agriculture
MoFED	Ministry of Finance and Economic Development
MoFT	Ministry of Foreign Trade
MoTI	Ministry of Trade and Industry
NBE	National Bank of Ethiopia
NLSC	National Leather and Shoe Corporation

OLS	Ordinary Least Square
RGDP	Real Gross Domestic Product
RSS	Residual sum square
SLDP	Second livestock development project
UNCTAD	United Nation Conference on Trade and Development
UNDP	United Nation Development Program
UNIDO	United Nation Industrial development
WB	World Bank

### **Abstract**

Ethiopian leather export sector has been the second most important source of foreign currency to the country. However its share among the country's merchandise export earnings has been declining in recent years. In terms of foreign currency, the export earning from this sector has been fluctuating mainly due to unstable nature of the international market price particularly in the 1990s. This study has, therefore, tried to examine the overall performance of the sector. In particular an econometric approach using Ordinary Least Square (OLS) has been applied to determine the significance of major quantitative factors for the variation in the supply response of the export sector under review. Consequently, the world market unit price/value of the exports and the local real exchange rate have been found to have significant effect on the long run supply of the export sector. In the short run analysis, the domestic consumption pressure and world supplies from major exporters are found important factors in hindering the growth of the export sector. On the other hand the real income of the country (which represents domestic production capacity) does not appear to have significant contribution to the change in supply response of the export sector under study. In addition, poor quality status and insufficient supply of the raw stocks were among the main constraints for local tanneries to operate under capacity and consequently contributing to the declining trend of the export earning. The main causes for these constraints include traditional way of production, preservation and storage facilities. Moreover, lack of premium prices for higher quality raw hides & skins supplies plays a major role for disincentive in quality upgrading and limits the rates of recovery.

# CHAPTER ONE

## INTRODUCTION

### **1.1 Background**

The basic feature of the Ethiopian economy is the dominance of the agricultural sector in terms of value added, employment generation and export earnings. The agricultural sector accounts for about 50 per cent of the gross domestic product (GDP), provides employment for about 85 per cent of the population, generates about 90 per cent of the export earning on average over the years (MEDaC, 1999/00).

Ethiopia is known for its large size of livestock resources in the continent. The livestock population size of the country in 1999 is estimated at 35, 22 and 17 million heads of cattle, sheep and goats respectively<sup>1</sup>. According to MEDaC (1999) the livestock resource base contributes 15 per cent to the total GDP and 33 per cent of the agricultural GDP. More than 80 per cent of the peasant households derive their livelihoods from a mixed farming-crop production and animal's husbandry. The Livestock sub-sector has multitude social and economic function in both the highland and lowland/pastoral farming systems. They are sources of food, draught power, cash income and fuel. While the livestock resources play a crucial role in the economies of rural population, its rearing in the country is not oriented towards the production of marketable surplus, except in some small private commercial sector. It is well known that traditional owners accumulate livestock for prestige and have an innate aversion to selling them.

Hides & skins are renewable, easily perishable resources and the major raw materials for tanning industry. As a secondary product of the meat consumption, the supply of hides & skins depend on the demand for meat, the rearing, management and slaughtering of animals,

with little response to change in price and demand for the products. On the basis of annual off take rates of respectively 7, 33 and 38 per cent, the average production is estimated at about 2, 8 and 7 million pieces of cattle hides, sheep and goatskins. These available raw materials are not entirely recovered by the tanneries mainly due to lack of communication and quality awareness and about 35, 87 and 71 per cent respectively for hides, sheep and goatskins are recovered through official market channels and processed by local tanneries (LMA, 2001). The remaining are either home processed for making of traditional household items (grain bags, clothing, shoe, rope, etc.), wasted, or illegally traded particularly by those people living across the boarder in exchange for consumer goods.

The major producers of the raw materials include slaughter slabs, municipal slaughterhouse, hotels, export abattoirs and meat & meat processing plants. Ahmed (2000) noted that in the absence of reliable data on the number of livestock slaughtered, his estimates for the 1980s reveal that about 80 per cent of cattle hides supply was from the rural areas where there are no amenities for performing proper slaughtering, ripping and flaying procedures while urban slaughterhouse accounted for 20 per cent. In the 1990s, the share of slaughterhouse in supplying hides has risen and estimated to 50-60 per cent; attributing to the expansion of slaughterhouse, slabs, and abattoirs constructed by municipalities, private firms and development projects. Regarding skin production, about 90-95 per cent is supplied from urban and rural backyard while 5-10 per cent is derived from some municipal slaughterhouse located at main urban center and the export abattoirs (Ahmed, 2000).

The export sector plays an important role to bring about sustainable economic growth in developing countries; however, in most cases only one or a few primary commodities are

responsible for most export earning. The feature of the Ethiopian export sector reflects typically least developing countries that heavily rely on few primary agricultural commodities, which are mainly based on agricultural product. The structure of the country's export sector, which is characterized by product concentration, has generally remained the same for decades. This is to mean there is no change in the composition of export goods, implying the country's continued reliance on few but traditional export commodities that face low price and income elasticities of foreign markets. The major export items include, in order of their significance in the total export value; coffee, hides & skins, pulses, oilseeds and fruit & vegetables. Export of 'Chat' (*catha edulis*) has become one among the major items in recent years.

The share of visible exports in 2000 indicates that coffee accounted for 52.2 per cent, 'Chat' 13.4 per cent, hides & skins 10.1 per cent and oil seeds 5.6 per cent; all these items together accounting for about 66 to 82 per cent of the total export earning in the 1990s. Coffee has been the single major important export item contributing 52 to 68 per cent to the overall export earning in the last decade. Export earning from 'chat' has achieved the second place, next to coffee, since 1998. Coffee, hides & skins and oilseeds together accounted for 75 to 89 per cent while coffee alone shared 56 to 77 per cent of the export earning from merchandise goods during the 1980s<sup>2</sup>. The composition of major export earnings is presented in appendix A where coffee remains relatively with significant share and hides & skins has exhibited consistently declining trend.

Similar to the overall export structure, the composition of private export sector is dominated by coffee, oilseeds & pulses and 'chat' that together account for 85 per cent and coffee alone 55 per cent of private export earning. Unless the country is able to tackle the chronic problem

of its dependency on narrow range of traditional export products, mainly coffee, it remains exposed to term of trade shocks. (MEDaC, 1999).

The country's exports not only concentrated on few major commodities but also on limited foreign markets. When we look at the geographical distribution, on average, about 45 per cent of the export goods have been destined to Europe markets. Germany, Japan, Saudi Arabia, USA, Italy and Djibouti, altogether absorb on average about 70 per cent, are major trade partners of Ethiopia (MEDaC, 1999).

The excessive reliance on those major export items over the last two decades seems the failure to promote diversified export products and enhance the performance of non-traditional exports. The higher the degree of commodity export concentration, the greater would be the export earning being affected by such risks as volatile nature of international price and adverse conditions on the supply of the major exportable items. The large share of Ethiopian exports in certain agricultural commodities with their low-income elasticities of demand mean that increase in output results in a less than proportionate increase in earning. In addition, the primary export commodities of the country have faced sluggish demand growth and terms of trade results in unstable earning.

Ethiopia, by world standard, exports insignificant hides & skins and almost negligible finished leather products. The average world share was about 7 per cent with the standard deviation of 0.06 in 1970-1990 (EEA, 1999). The reputation of Ethiopian leather is particularly strong in sheepskin because of its special nature of fine grain and compact texture and the skins are rarely sheared to result in better quality products. The sheepskin is highly

demanded in the international markets for very soft gloves such as golf gloves where as goatskins use as suede (World Bank, 1997).

However the raw material base is unutilized efficiently due to various problems encountered in the overall livestock management and poor production & handling technique. Those hides & skins reaching the tanneries are suffered from quality problems, which could be resulted from, among other things, skins diseases & health problem of the animals, physical abuse, poor nutrition in live animals and inappropriate & primitive methods of recovery from carcass and slaughtering animals. In addition, poor handling in storage (leaving raw hides & skins in the hot sun lead to bacteria actions), transportation and outdated processing technique reduce the quality and thus final export values.

During the Derg era, Ethiopian export sector had been weak and uncompetitive owing to by and large policy constraints. It was mainly constrained by, among others, excessive exchange rate control and a relatively high tariff protection coupled with pervasive quantitative restrictions on exports and imports. The nominal exchange rate was maintained at birr 2.07 per US dollar, increasingly over-valued over time that limited the growth of exports and raised the costs of imported inputs to potential exporters. The domestic currency unit price did not fully reflect the actual prices paid to producers because of government intervention in marketing, selling and exporting of many of agricultural commodities. The distortionary government marketing, pricing and exchange rate policies had generally created disincentive for exporters to improve, expand and diversified export commodities and reduce their margin in terms of local currency. Private sector's role had been marginalized to freely involve in export investment activities and its share never exceeded 16 per cent of the export earning

while that of public enterprises had been intensified. The level of investment was also obviously inadequate to expand, modernize and diversify Ethiopian export sector (MEDaC, 1999).

In order to promote sustainable export growth, a number of external trade reforms have been proposed and undertaken based on free market perspective since 1992. The main objectives of the reforms are to encourage more active participation in the world trade flows (especially manufacturing) and provide producers' incentives to raise capacity & efficiency in export quality, diversification and production of tradable goods.

The reform package includes progressive reduction of discrimination against agricultural exports, and reorganization of state owned enterprises. Government intervention in terms of marketing and pricing of exportable have been liberalized while the exchange rate control was initially relaxed by 58 per cent from birr 2.07 to 5.00 per US dollar in October 1992; and subsequent continuous depreciation of the birr through biweekly auction exchange rate market system since May, 1993 and weekly exchange rate market has been in place since 1996. Free entry and exit in domestic and export trade, official access to foreign exchange rate, successive tariff adjustment, removal of capital investment ceiling are also some of the incentives to private participants. Export taxes, except on coffee, have been eliminated and even that of coffee is rationalized and the maximum tariff on imports has gone down gradually from 280 to 40 percent. The trade policy reform concentrates on providing a stable environment for sustained export growth and reducing or eliminating the anti-export bias of the incentive system as part of effort to minimize price distortion in the functioning of the market.

The trade policy reform measures seem to have positive impact on the export performance in particular and the country's economy in general since its commencement in 1991/92. For instance, a substantial recovery is observed as export of goods has recorded high growth rate of 28 per cent in the reform period (1992/93-1997/98) while it was restricted to an average yearly deceleration of 10 per cent in the period before the introduction of the reform, i.e., 1985/86-1989/90. The role of private sector participation, which accounted for about 80 per cent of the export earning in 1997/98, has also been encouraging in export marketing (MEDaC, 1999).

## **1.2 The Research Problem and Hypothesis**

The instabilities of export earnings are usually defined in terms of short run deviation around a trend. Polume (1992) noted that fluctuation in earnings from the export of primary commodities, partly due to unstable prices, have long been a major cause of concern for primary producing countries. Countries that are still largely dependent on export of primary products are developing countries.

The Ethiopian export earnings particularly those derived from dominant agricultural exports such as coffee, have been subject to large fluctuations mainly because of the unstable nature of international prices. The economic growth of the country has been too weak to absorb the effect of these exogenous shocks; it is less flexible to deal with both internal and external disturbances. Therefore the instabilities and decline in earnings are found to affect the economic growth adversely and there is a need for large foreign exchange reserve in the short

run while trade and exchange rate policies reforms would be the long run instruments to reduce the instabilities in the export earning (Amin, 2001).

Export of leather sector represented the second most important source of foreign exchange earning of the nation until very recently. It has contributed, on average about 14.3 per cent in 1980-95 and 9 per cent in 1996-2000; consistently declined to 6 per cent of the total export revenue in 1999<sup>3</sup>. The value obtained from this sector was steadily rising from about \$ 5 million in 1975, reached a maximum of \$ 68 million in 1979 and thereafter it has suffered a slow down with instabilities to \$ 32.4 million in 1999 presumably in response to falls in the world market prices and weak demand that resulted from loss of international quality standard. That is, the export earning fell, on average, by 7.6 per cent per annum, which was largely due to the shortfall in the volume of export by an average of 6.9 per cent during 1994-99<sup>4</sup>. The time profile of export earning and volume exported is depicted in appendix B.

Given that Ethiopia possesses a vast natural livestock resource endowment and massive labour force, there exists an opportunity for the development and competitiveness of the sector. However, if not effectively handled, expanding the quality and quantity of the production can be a serious challenge. The use of limited procedure and technique for slaughtering & flaying, and lack of appropriate preservation, transport and storage facilities coupled with natural defects downgrade the standard of raw material and reduce the value of end products (leather & leather items) and thereby the foreign earning of the country. For instance, top qualities (1<sup>st</sup>-3<sup>rd</sup> grades) of hides & skins production stood at about 60-70 per cent during 1977- 87; which have been deteriorating and accounting for less than 50 per cent

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<sup>3</sup> Data from NBE, quarterly statistical report

<sup>4</sup> Data from UNCTAD, International trade statistics

(Mulat, 1998). As a result, rejects have been increased since this time. In addition, Hadley (2001) concluded that, during the 1990s, top grades declined as low as to 20 per cent from 60 per cent.

The drop in selections (poor quality performance) is directly proportional to the value forgone. Kidanue (2001) tried to estimate the forgone foreign earnings at about \$ 9.5 and \$ 5.1 millions respectively from sheepskin and goatskins every year. In addition, quite considerable part of domestic production of raw hides & skins could not be recovered, incurring a loss to the country. Owing to these facts, the leather export sector should face problems so that it cannot be competitive in the foreign market and then maintain its market share.

This research thus seeks to examine and analyze the effect of those possible major determinant factors that hinder the growth and the overall performance of leather export sector and tries to addresses issues that enhance the growth, competitiveness in the international markets and eventually maximize the benefit that could be earned from the sector.

The basic hypothesis of this research relies on easing export restrictions, government control of markets & prices, the disincentive on private sector and devaluation of the exchange rate have improved the price received by the exporters. For instance the primary justification for devaluation of the birr is to increase export price in local currency, which should make exports and efficient import substitution more profitable and ultimately lead to higher export production. However, it is often argued that a positive output response may take place in the

economies of developed countries and may not in African countries. Beside positive supply response of exports, devaluation is expected to diversify exportable from illicit trade to official channel. The reforms are indeed an incentive to the private sector to be a major actor in the export market. To the extent that the policy reform is effective in real terms, we expect an increase in the price of export with respect to non-tradable and export producers' income in local currency so that they could be motivated to raise potential resource use in the production of export. In other words, the reforms provide the export producers price incentive to accelerate the growth and improve the quality standard of export commodities and thereby sustaining the export earning.

### **1.3 Objectives of the study**

Given the domestic available raw materials (raw hides & skins) and the economic importance of leather export sector to the country, the supply and value earning of leather export goods have been fluctuating with declining trend. Therefore, it is necessary to identify all the constraints that inhibit the overall performance of the export sector for sustaining growth and benefit. This leads to the following specific objective.

- i) to measure the effect of international price movement and other quantitative determinants on the supply of leather goods exports over the last three decades
- ii) to identify those qualitative factors and constraints hindering the growth of the export sector, and
- iii) to draw pertinent recommendations based on the results obtained to improve the sector's performance.

### **1.4 Significance of the study**

It is important to understand how changes in trade and exchange rate policies could affect relative domestic price, output level and trade flows or resource shifts of a specific exportable commodity such as leather. The output of this study is expected to provide estimates of production response for export of leather products with respect to change in prices and other quantitative determinants, identify qualitative factors and policy relevant information for sustain growth of the export sector under study. The results can be used, as an input towards designing appropriate extension programs and development projects to maximize the benefits of the sector.

### ***1.5 Scope and Limitations***

The performance of leather export sector could be influenced by numerous internal and external qualitative factors, and as such a cause and effect type of equation will be difficult to formulate. Hence this study will be based mainly on qualitative evidence as well as important quantitative explanatory variables in order to capture their effects on the supply response of the export sector. However lack of relevant forms of data together with inconsistency is found as the main constraints of the present study.

### ***1.6 Organization of the paper***

The paper is structured in six chapters. Chapter two reviews the development efforts undertaken towards hides & skins production in Ethiopia. The third chapter looks at both relevant theoretical and empirical literature. Model specification and description together with data sources are presented in chapter four. Chapter five deals with estimation of the model and analysis of the results. Chapter six presents conclusion and recommendations.

## **CHAPTER TWO**

### **THE DEVELOPMENT OF HIDES & SKINS PRODUCTION IN ETHIOPIA**

The history of leather production goes right to prehistoric times, when primitive methods were developed for treating raw hides & skins so that they could be used for clothing to protect the people from various elements. The preservation of rawhides & skins by smoking and treatment with vegetable matter for its durability is an indication of the beginning of standardization in the leather sector.

#### **2.1 Pre 1974**

The Ethiopian economy during the imperial period was characterized with the feudal land tenure system that deprived the vast population of the rural poor from the right to own land. However, the economic policy initiated the expansion of foreign private companies in the tanning (Asco currently called Addis tannery and Darmar/Awash/ELICO), meat & meat product processing and dairy industry in the country. The Addis Ababa slaughterhouse, Combolcha, Dire Dawa, Melka Wondo, Gondar Meat processing plants and the Addis Ababa meat concentrate were established at strategic locations adjacent to the potential livestock regions of the country to serve as market outlets for live animals and eventually to export meat and meat products.

The setting up of these plants paved the way for the transformation of hides & skins preservation methods from traditional (ground drying, pegging, pole drying) to frame drying and wet salting. The Addis Ababa slaughterhouse, owned by Italians, and the meat processing plants were engaged in export of very limited hides, which were either frame dried or wet salting raw hides in its premises to foreign countries. However, this way of preservation

activities did not keep pace towards quality upgrading at a wide scale across the country and as a result the major proportion of the raw stock entering the markets was not properly preserved.

The economic importance and the potential of hides & skins resource of the country have stimulated a number of development interventions in seeking to upgrade the standard of the raw materials and enhance the volume entering the formal market chain through launching hides & skins improvement program and donors assisted development projects.

There was no any tangible system implemented towards quality upgrading of hides & skins at a wide scale across the country until 1964 when the Livestock and Meat Board (LMB) was set up under proclamation No. 212/ 64, whose objective was to undertake livestock, its product and by-products management through out the country. The on set of hides & skins improvement activity at a wide scale across the country is linked with the birth of LMB. The board produced technicians who were trained with the basic technique of slaughtering, flaying, preservation and grading of raw materials and assigned them to the potential provinces. Manuals and regulations were issued in addition to the construction of markets and demonstration centers for raw hides & skins. LMB also supervised and monitored the construction of slaughterhouses at different regions of the country (LMA, 2001).

The LMB launched the second livestock development project (SLDP 1973-81) that was financed by World Bank to improve the livestock marketing, infrastructure and thereby quality of hides & skins through a package of investment on stock route, market, slaughterhouses and hides sheds as well as ranch development. More specifically, the project

aimed at minimizing weight losses and cost of livestock movement, introduce auction system to increase producers' margins and improve the quality standard of hides & skins. The project had laid a foundation for the operation of hides & skins improvement extension service and regulatory activity in the country (LMA, 2001).

During this period, it was generally made possible to introduce the principle and applications of modern hides & skins improvement procedures and grading technique and there by create awareness the public about the economic significance of the raw materials. The construction of slaughter premises, modern hides & skins drying sheds, establishment of private tanneries, shoe and garment factories that increased the local tanning capacity were also effected. The persuaded policy environment and the efforts made by LMB enabled to achieve considerable quality improvement and growth in volume of hides & skins that entered the formal market chain (LMA, 2001).

## ***2.2 The period 1974-91***

The change in government and economic policy that took place in 1974 was based on socialist principle. The policies include radical measures such as land reform, nationalization of commercial and large scale private farms, industrial plants and economic institutions, expansion of state farms, organization of peasant associations, producer's cooperative service and villagization program for the rural community.

In 1975 private tanneries, shoe & garment factories that were engaged in the production of leather & leather products for domestic and export marketing were nationalized and administered under the then National Leather & Shoe Corporation (NLSC). The corporation

assisted the existed hides & skins improvement extension service with treated salt meant distribution among traders for preservation of hides & skins.

The SLDP remained in the construction of slaughterhouse and sheds while the Ministry of Agriculture (MOA) with its provincial offices undertook the task of extension service at small scale along with the on-going efforts of the SLDP, which terminated its operation in 1981, and thereafter the entire mandate for hides & skins extension and regulatory services was vested to the MOA that could gradually extended the service to cover the whole country. The Ministry was empowered to regulate the trade and thereby improve the quality status of hides & skins that reached the central markets. The MOA and NLSC jointly implemented regular supervision and follow-up on hides & skins quality improvement activities.

Hides & skins marketing corporation (HSMC), as a state enterprise, was organized to accomplish the procurement and then export of raw hides & skins until 1986 when the exports of raw hides & skins were banned. The corporation unilaterally fixed the prices for raw hides & skins and subsequently the NLSC, MOA and Ministry of foreign trade (MOFT) together were given the mandate for pricing of raw hides & skins. As the network of the corporation was widely extended even to the site where the raw materials were produced, it contributed a lot in facilitating the collection and supply of raw hides & skins to the domestic and export markets. The farmers' service cooperatives, during the period, also played a significant role in upgrading the standard of raw hides & skins and they were especially recognized as sources of high quality from dried cattle hides to the central markets; besides delivering various services to their members. The cooperatives constructed preservation sheds for raw hides &

skins that were collected from each member and sold them to the NLSC or HSMC after preserved properly.

Apart from the development interventions towards the improvement of hides & skins, the MOA employed more staffs at regional, provincial and wereda level to follow-up the activities of regular program and development projects. It launched training programs at different level for existed staff, butchers, flayers, traders, and artisans and distributed teaching aids, demonstration equipment, and insecticides to regional agricultural bureaus. The Ministry issued renewal-working license for hides & skins traders based on close inspection of their sheds and permit for those hides & skins delivered to the central market based on standard quality control and appropriate handling & transportation methods (LMA, 2001).

The SLDP made significant contribution to the development of hides & skins extension service and subsequent improvement of the raw materials. The notable achievement included the deployment of hides & skins staff, launching training program for butchers, flayers, traders and the public at large, construction of more slaughterhouse with attached drying sheds and inspection on raw hides & skins that were destined for domestic and export market. In addition, the project encouraged buying and selling of hides & skins based on quality grade differences. It also purchased hides & skins at its demonstration site where the raw stocks were made ready for exports. The efforts made by the regular program and project, during the last regime, strengthened the extension service and raised both the quality and the revenue from export of hides & skins and leather products<sup>5</sup>.

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<sup>5</sup> ሪፖርት ላይ 1982 ዓ.ም. በብሔራዊ ምርትና ምርት ማሻሻያ ስራ ላይ የተደረገው ስራ ይገልጻል።

### **2.3 Post 1992**

Since 1992, the new economic policy attaches great importance to the liberalization, privatization and internationalization of the country's manufacturing sector with the commitment to replace the hitherto significant role of the state with greater domestic and foreign private participation. In conformity with the country's comparative advantage, manufacturing is expected to rely on labour intensive technology and utilization of domestic available raw materials. The aim is to put manufacturing sector on a competitive basis internationally and progressively shift the composition of exports from primary agricultural products to manufactured goods. By doing so, the sector maximizes its market share through quality improvement, increasing productivity and would have a higher contribution to the economic growth of the country.

Some of the policy measures in particular to export of leather production and its export sector growth include privatization of state enterprises, institutional reforms, abolition of state monopoly (marketing and pricing policies) and promotion of private investment. Moreover, all exports except coffee are exempted from taxes, hence encouraging activities geared for the export markets. Following these policy reforms, public meat processing plants, tanneries and leather items & shoe factories have been privatized. In order to take advantage from relatively enormous raw hides & skins resource potentials, six state-owned and a number of small private tanneries have established themselves well. All the tanneries process hides & skins to the stage of pickled, wet-blue, crust or finished leather. There are many footwear factories today, both private and state-owned, which are engaged in the production of footwear from leather, canvas and rubber. Privately owned factories are relatively smaller in size and produce leather and plastic footwear (MoTI, 1998).

While some of the state tanneries have been privatized and a number of small private tanneries expanded, the tanning industry has faced a shortfall of supply and poor quality of raw materials (hides & skins). The low recovery of the raw stock results from high demand of rural small tanners, poor infrastructure & extension service and marketing facilities. For low quality standard, absence of efficient handling and discriminatory pricing in favors of high quality supplies (i.e., lack of effective marketing system and standardized pricing policy) are the major ones.

According to the report by LMA (2001), since 1992, the NLSC has been dissolved and the state tanneries become autonomous, the Ethiopian Tanners Association (ETA), comprising both public and private tanneries, has emerged and set up selling price of raw hides & skins based on quality grades in line with international price movements. However, traders and the association have not shown effective contribution towards upgrading the raw materials, created price incentives and facilitated timely delivery. Some tanneries do not strictly adhere to the prices rather pay premium to attract sufficient quantity supply. Hides & skins traders' association also play crucial role in influencing the prices, especially those traders with big storage capacity of the raw stocks tend to have a strong bargaining position. This implies that in the absence of efficient auction market system and market information, the traders are the major beneficiaries from entire transaction. This results in a steadily deterioration of quality production of hide & skins. The ETA has played a role in supporting the extension service. It has also sponsored various workshops, seminars, trade fair and studies related to hides & skins improvement services. ETA is implementing Common Fund for Commodity (CFC) project that install quality grading using pricing scheme since 2001 in selected zones of South Nation Nationalist People region.

The Addis Ababa abattoir organization (AAAO) used to supplying raw hides & skins to the state tanneries on the contractual basis at fixed price during the past regime. Since the price has been deregulated in the current economic policy, it has introduced an auction market system that is open to all tanneries or buyers. The prices of skins are comparable to that of ETA while prices of hides are much smaller.

Apart from government efforts, there were various interventions through livestock development projects with a direct or an indirect impact on increasing quantity and upgrading the quality of hides & skins production. Hides & skins improvement extension pilot project, under UNIDO support, was one among others, designed to promote improved techniques for handling, curing and thereby upgrading the quality of hides & skins and construction of small-scale abattoirs and hides & skins sheds. The project implementation was limited to three zones of Oromya and five zones of South Nation Nationalist People (SNNP) regions.

The project trained the staff, artisans and traders; distributed posters; provided appropriate flaying & ripping knife, hammers, vehicles, and motor cycles; introduced recording defects assessment system for quality follow-up and constructed rural slaughter slabs with hides & skins sheds. It also conducted studies on hides & skins diseases such as 'ekek' and procurement of hides & skins based on quality grading. UNIDO assistance to rehabilitate some of the existing tanneries and treating their effluent also deserve attention (LMA, 2001).

Despite these development intervention and efforts made during the current economic policy environment, the envisaged development could not be realized and the results obtained so far are relatively not encouraging. A number of studies and reports (LMA 2001, Kidanue 2001,

Ahmed 2001, Hadley 2001, Teshome 1995 and World Bank 1997) concluded that the quality of the raw materials has been deteriorated and challenged the sector during the period. Most of them argued that lack of incentive to suppliers of quality raw materials, inadequate slaughterhouse & rural slabs, preservation, storage and transportation facilities, absence of competitive market, unfair competition between local tanneries, together with obsolete production equipments and unskilled practices have contributed for the sector to be less competitive in the international markets. Technological deficiencies are also largely blamed as the export constraints in diversifying manufactured leather products. The emergence of countrywide spread parasitic infections, locally known as 'ekek', has made much worse and results in serious blemishes of finished leather products and deterioration of export quality that yields in loss of demand and then decline in prices in the world market.

The Ethiopian standard on hides & skins and leather has been enforced as mandatory standard during the last ten years. Even though it has been implemented for a decade, it has not produced the desired effect on the leather sector. However, the Ethiopian standard, whose contribution to the development of quality concept in the sector in particular and to the national economy growth of the country at large is undeniable (Jemberu, 2001).

Recognizing livestock and its products and by-products having an important role in the economy, it has become necessary to regulate, control and coordinate the supply and marketing of these resources in appropriate ways in order to maximize the benefit that the country can obtain. On the other hand, export of leather sector in particular, among the major export had, until very recently, no specific body responsible in an efficient and centralized manner, except specialized activities that require handling by a different body to restore and

enhance efficiency in terms of quality, growth and diversification of the sector. To this effect, a related public authority, agency and training institution have been established since very recently.

Accordingly, the Ethiopian Livestock Marketing Authority (LMA), established in 1998 with proclamation No 117/98, has the objectives of promoting the domestic and export marketing of animals, animals' products and by-products through increasing their supply and improved quality. It has the mandate to follow up the preservation of hides & skins from slaughtering to marketing of the products and offer technical support & advice to the regional states. The authority, since its commencement of operation in 1999, has gone through preliminary survey on situations across regions, hides & skins quality and correlation between raw and semi-processed hides & skins, cost of production of semi-processed leather. It has also developed hides & skins extension development strategy and implementation and more manual & construction guidelines for hides & skins shed and slaughterhouse.

The Ethiopian leather & leather products training development institution (ELLPTDI) has been set up with proclamation No. 132/98. The institute produces trained personnel for domestic leather manufacturing industry that would allow the production of standardized products for international markets. It has also introduced new and modern technologies to the local tanning industry and finished leather goods producers. Furthermore, the Ethiopian export promotion agency (EEPA), which was established in 1998, is trying to alleviate problems faced in the country's export trade and enhance the competitiveness of exporting enterprises in the international market. Based on the government's export strategy, it has

rendered professional support and training to the exporters by undertaking studies and assigning various schemes to promote the export sector.

Despite the country has been potentially endowed in livestock resource (raw materials base) to establish itself as an important producer & exporter of leather goods, several factors inhibit the growth and hence the benefit obtained from export of various leather commodities. These require urgent attention for the country to rely on export of leather production as a major support for its sustainable economic development. The concerns include comprehensive measure to improve the quality status of the raw hides& skins, the need to modernize existing leather plants, intensification of leather & leather goods research and development for sustainable growth in leather production and export earning.

## **CHAPTER THREE**

### **LITERATURE REVIEW**

#### ***3.1 Theoretical Review***

In a developing nation like Ethiopia, international trade can play an important role in its economic growth. Haberler (1964) pointed out that trade can lead to the full utilization of otherwise underemployed domestic resources. That is, through trade, a developing nation can move from an inefficient production point inside its production frontier, with unutilized resources because of insufficient internal demand, to a point on its production frontier with trade. For such a nation, trade would represent an outlet for its potential surplus of agricultural commodities and raw materials. This has indeed occurred in many developing nations, particularly those in South Asia and West Africa. In addition, it is an excellent antimonopoly weapon because it stimulates greater efficiency by domestic producers to meet foreign competition. This is particularly important to keep low the cost and price of intermediate or semi finished products used as inputs in the domestic production of other commodities.

A nation's pool of human and other resources is limited. The ability of the nation to produce a high and rising standard of living for its citizens depends not just on the amorphous of competitiveness but on the productivity with which the nation's resources are employed. The idea is that these resources be deployed in the most productive uses possible. Productivity depends on both the quality and feature of products, which determine the prices they can command and the efficiency with which they are produced (Porter, 1990).

The process of expanding exports from more productive sector, shifting less productive activities abroad through foreign investment, and importing goods and services in those

sectors where a nation is less productive is a healthy one for national economic prosperity. In this way, international competition helps upgrading productivity over time. The process implies, however, that market position in some sectors must necessarily be lost if a national economy is to progress.

The exposure to international competition creates for each sector an absolute productivity standard necessary to meet foreign rivals, not only a relative productivity standard compared to other sectors within its national economy. Even if a sector is relatively more productive than others in the economy and can attract the necessary human and other resources, it will be unable to export unless it is also competitive with foreign rivals. If sectors that are losing position to foreign rivals are the relatively more productive ones in the economy, a nation's ability to sustain productivity growth is threatened. The same is true when activities involving high levels of productivity are transferred abroad through investment because domestic productivity is insufficient to make performing them in the nation efficient, after taking foreign wages and other costs into account.

Porter (1990) noted that a rising national share of world export is tied to living standards when the growth of exports achieving high level of productivity contributes to the growth of national productivity. A fall in overall world export share because of the inability to successfully increase exports, conversely, is a danger signal for a national economy. However, the particular mix of exports is more important than a nation's average export share. A rising sophistication of exports can support productivity growth even if overall exports are growing slowly.

The rationale for international trade stems from distinctive national endowment that lead to differences in comparative advantages that argues countries sell goods whose production costs are lower than others and purchase goods they can not produce as effective as others. Adam Smith is credited with the notion of absolute advantage, in which a nation exports an item if it is the world's low-cost producer. David Ricardo refined this notion to that of comparative advantage, recognizing that market forces will allocate a nation's resources where it is relatively most productive. This means that a nation might still import a good where it could be the low-cost producer if it is even more productive in producing other goods. He developed the theory of comparative advantage based on the assumptions of perfect competition and the full employment of resources; countries can reap welfare gains by specializing in the production of those goods with the lowest opportunity cost and trading the surplus of production over domestic demand, provided that the international rate of exchange between commodities lies between the domestic opportunity cost ratio.

These are essentially static gains that arise from the reallocation of resources from one sector to another as increased specialization, based on comparative advantage, takes place. The static gains stem from the basic fact that countries are differently endowed with resources (natural and acquired) and because of this the opportunity cost of producing products varies from country to country. The static gains from trade are measured by the excess of import substitution; by what is saved by not producing the imported goods domestically. The resource gains can then be used in a variety of ways including increased domestic consumption of both goods (Thirlwall 2000).

The theory of traditional trade argues that if each nation specializes in the production of the commodity of its comparative advantage, world output will be greater and, through trade, each nation will share in the gain. With the present distribution of factor endowments and technology between developed and developing countries, the theory of comparative advantage thus prescribes that developing nations should continue to focus primarily in the production of and export of raw materials and food to developed nations in exchange for manufactured products (Salvator, 2001).

Thirlwall (2000) also tried to examine the dynamic gains from trade which continually shift outwards the whole production possibility frontier of countries if trade is associated with more investment and faster productivity growth based on scale economics, learning by doing and the acquisition of new knowledge from abroad, particularly through foreign direct investment. The essence of dynamic gains is that they shift outwards the whole production possibility frontier by augmenting the availability of resources for production through increasing the productivity of resources and increasing their quantity. One of the major dynamic benefits of trade is that export markets widen the total market for a country's producers. Other important dynamic benefit from trade consist of the stimulus to competition; the acquisition of new knowledge, new ideas and the dissemination of technical knowledge, the possibility of accompanying capital flows through foreign direct investment and changes in attitude and institutions.

The resulting theory of comparative advantage is rich in its implication about the gains from trade, the following among them: (i) any country can increase its income by trading because the world market provides an opportunity to buy some goods at relative price that are lower

than those which prevail at home in the absence of trade (ii) the smaller the country the greater this potential gain from trade but all countries benefit to some extent (iii) a country will gain most by exporting commodities that it produces using its abundant factor of production most intensively while importing those goods whose production would require relatively more of the scarce factor of production (Gills M., Perkins D.H., Roemer M. and Snodgrass D.R, 1983).

Comparative advantage based on factors of production has intuitive appeal, and national differences in factor costs have certainly played a role in determining trade patterns in many sectors. This view has informed much government policy toward competitiveness, because it has been recognized that governments can alter factor advantage either overall or in specific sector through various forms of intervention. Governments have rightly or wrongly, implemented various policies designed to improve comparative advantage in factor costs. Examples are reduction of interest rate, efforts to hold down wage costs, devaluation that seeks to affect comparative prices, subsidies, special depreciation allowance and export financing addressed at particular sector. Each in its own way, and over differing time horizons, these policies aim to lower the relative costs of a nation compared to those of international rivals.

Tussie (1989) argued that export competitiveness is most strongly influenced by government policy. This view identifies targeting, protection; export promotion and subsidies as the key to international success. Yet such a decisive role for government policy in competitiveness is not confirmed by a broader survey of experience and has been ineffectual. Looking across nations, the sectors in which government has been most heavily involved have, for the most

part been unsuccessful in international terms. Government is indeed an actor in international competition, but rarely does it have the starting role.

The theory of international trade has appeared whose main policy message has been to challenge the policy conclusion of traditional trade policy based on static comparative advantage that the optimal policy is one of neutrality of incentive and non-interventions in international trade. While the new trade theories do not lend support to a return to the high levels of protectionism that were common in developing countries in the past, they do arrive at policy conclusions that are quite different from those of conventional trade theory. In general, it can be said that the main policy implications of the new trade theories is to rescue the validity of a degree of trade policy selectivity.

The standard theory of trade rests on factors of production. Factors of production are nothing more than the input necessary to compete in any industry, such as labour, arable land, natural resource, capital and infrastructure. To understand the enduring role of factors in competitive advantage, it is increasingly necessary to discriminate among types of factors. Porter (1990) has made an important distinction as basic and advance factors of production. Basic factors include natural resource, climate, location, unskilled and semiskilled labour, and debt capital. Advanced factors include modern digital data communication infrastructure, highly educated personnel and university research institutes in sophisticated disciplines.

Few factors of production are truly inherited by a nation. Most must be developed over time through investment and the extent and difficulty of the required investment varies dramatically. The distinction between basic and advanced factors, while inevitably a matter of

degree, seeks to capture these distinctions. Basic factors are passively inherited, or their creation requires relatively modest or unsophisticated private and social investment. Increasingly, such factors are either unimportant to national competitive advantage or the advantage they provide for a nation's firms is unsustainable. The importance of basic factor has been undermined by their diminished necessity, their widening availability or ready access to them. They remain important in extractive or agriculturally based industries and in those where technology is widely available. Advance factors are now the most significant ones for competitive advantage. They are necessary to achieve higher-order competitive advantages such as differentiated products and proprietary production technology. They are scarcer because their development demands large and often sustained investments in both human and physical capital (Porter, 1990).

For sustain advantage, firms must achieve more sophisticated competitive advantage over time, through providing higher-quality products or producing more efficiently. Competitiveness requires effective utilization of available resources. Moreover, in today's competitive global market, competition is not only about price but also about supplying quality products. This translates directly in to productivity growth. As a result, quality has become strategic target involving all, both in and out of the firm in the management of its interference with client and environment.

According to the standard theory, nations are endowed with differing stocks of factors. A nation will export those goods, which make intensive use of the factors with which it is relatively well endowed. A nation's endowed of factors clearly plays a role in the competitive advantage of a nation's firms. Yet the role of factor endowment is more complicated.

Comparative advantage from factors depends on how efficiently and effectively they are deployed. This reflects the choice made by a nation's firms about how to mobilize factors as well as the technology used to do so. The mere availability of factors is not sufficient to explain competitive success; indeed, virtually all nations have some attractive factor pools that have never been deployed in appropriate industries or have been deployed poorly. Other determinants will be necessary to explain where factor advantage translates in to international success because this shape the way factors are deployed.

### **3.2 Empirical Review**

The notion that developing countries can accelerate their economic development by expanding exports and in particular exports of manufacturing has become conventional wisdom. Many economists have demonstrated, at least in broad terms, the contribution of trade to growth and development. Even those who remain skeptical of the role of the market concede that trade is an important component of economic growth. Many developing countries now recognize the importance of trade for efficiency, a healthy balance of payment, employment creation and the exploitation of comparative advantages in resource endowment (Panoutsopoulos, 1992).

Before the 1950s, it was conventional wisdom that the road to development could be traversed most rapidly by following comparative advantage, exporting foods and raw materials. Many countries in the third world such as Colombia, Mexico, Ghana, Nigeria, Malaysia and the Philippines have undergone significant structural change as a consequence of primary exports, although these changes have propelled them only part of the way to development (Gills M., Perkins D.H., Roemer M. and Snodgrass D.R, 1983).

The earlier characterization of developing and industrial countries exports is out of date. The composition of exports from developing countries has changed; shifting from traditional primary commodities to manufactures and services. Sharp fluctuation in the prices in the international market, together with cyclical swings of these products led developing countries to diversify, exporting fewer primary products and more services and manufactured goods. Raw agricultural and mineral materials are no longer simply exported from developing to industrial countries. Instead, raw materials at various stages of processing are now exported by both industrial and developing countries not only to industrial countries but also to industrial developing countries.

The developing countries that have expanded and diversified their exports of primary products and have become engaged in manufacturing have gained in growth of export earning and stability. Exports of manufactured goods have been the most rapidly growing component of the export sector; capturing an increasing share of these markets. The industrial economies provide demand for these products, absorbing more than 60 per cent (Panoutsopoulos, 1992). On the other hand, since the early 1970s, the industrial economies' market for manufacturing has been growing less rapidly than their imports; reflecting the growing competitiveness of export of manufactures from developing countries. Developed countries dominate trade in primary commodities as indeed they do all world trade. The top ten exporters of raw hides & skins are all developed countries, as are the exporters of raw materials (Gbasb, 1992).

The recent trend in leather production worldwide point to the transfer of the raw materials from developed to developing nations where cost of labour is relatively very cheap. The stringent environment effluent discharge and high labour, treatment & processing costs force

most developed economies to export raw hides & skins while focus on technically advanced goods produced from high quality raw materials and technology with low labor inputs. On the other hand, developing countries have been engaged in processing of raw hides & skins for semi-finished leather by taking the advantage of domestic resources and low labour costs.

The structure of world trade in hides and skins, leather and leather products indicates, for instance, that United State, France and Germany were the leading exporters; accounting for 43 per cent of the total world earning from export of raw hides & skins in 1994. During the same period, developed countries have been dominating export of finished leather and leather products and Italy, Republic of Korea and Hong Kong gained about 40 per cent of world finished leather export earning while Italy, China and Hong Kong were the leading exporters of leather products; accounted for about 33 per cent from these products in the periods<sup>6</sup>. During 1994-98, USA, Italy and China exported raw hides & skins, finished leather and leather products that accounted for about 27, 25 and 40 per cent of the world export earning from respective products<sup>7</sup>. Africa with 19.2 per cent world livestock population accounts for 14.2 per cent of world hides & skins and less than 6 and 3 per cent world leather production and leather product output respectively<sup>8</sup>. It is not exploiting the potential to value added through manufacturing.

Panoutsopoulos (1992) noted that a rapid expansion in the number of countries seeking to export manufacturing and a few countries adopted policies that made it possible for them to do so. Despite these efforts, many countries failed. It soon becomes evident that the

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<sup>6</sup> ረዳታሽሽ ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን 1996

<sup>7</sup> ረዳታሽሽ ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን 2001

<sup>8</sup> ላህም በብሔራዊ ስልጠና ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን ዲቪዥን

introduction of exports incentives to offset import substitution measures is not enough. The countries that become exporters at low domestic resources cost are those that move towards high labour intensity in exports by the adoption of appropriate technology, specialization, economies of scale and by the elimination of distortion in relative factors prices. India's leather industries contribute significantly to its exports. Recently there has been a structural transformation in the country's leather industry, with the focus shifting from exports of raw hides & skins to exports of more value added products, such as shoe. The industry has certain inherent advantages, including its large raw-material base and competitively priced labour. It also tends to be composed of mainly small-scale tanneries located throughout the country (Jha, 1997).

Export growth probably represents Ethiopia's most pressing challenge for sustainable socio-economic development. Like some developing countries, Ethiopia has the potential (abundant and cheap labour, rich soil, water and favorable climate) to develop diversified and more manufacturing exports that required low skill and capital-intensive investment. It is based on maximizing value added to the local resources at every processing stage and component while pursuing autarky course in export competitiveness. However the resource endowment and availability of cheap (abundant) labour are not sufficient to compete internationally. Despite the fact that Ethiopia has relatively abundant resource potential, the leather sector is not able to be competitive even in the domestic market.

Since 1986, Ethiopian exports of raw hides & skins have been banned and diverted to the local tanneries; intended to raise the values from exports of semi-processed (pickled, wet blue and crust) and finished leather products (upper, lining and garments). These products are

thought of a means of value adding mainly based on labour-intensive and sewing processes at low cost; very similar to cotton garment production. Berhanue and Kibre (2002) attempted to estimate elasticities (factor share) of labour and capital in the tanning and footwear industries. The elasticities suggest that labour has a relatively higher share of value added, about 57 and 55 per cent than capital with 49 and 43 per cent in the tanning and footwear industries respectively. Given the labour intensive nature of the production of the leather sector, the values are more or less consistent with economic theory. However, only 69 and 67 per cent respectively of the variation in value added explained by these inputs.

Since the restriction on export of the raw hides & skins, the composition of production from tanning industry has been changed. For instance, semi-processed hides & skins constituted about 32 and 96 per cent respectively while the remaining were finished leather in 1993. This implies the degree of processing/tanning is largely limited to semi-processing activities. Only about 14 per cent of the total production in tanning sector is finished leather. All the semi-processed products were destined for foreign market where as the finished leather was supplied to local manufacturing for leather goods (Tesfaye, 1995). A relatively higher value added can be attained by producing higher stages of processing and further proceed to the production of leather goods than limited to partial processing.

In Ethiopia, supply of raw hides & skins is entirely from domestic source and are largely processed at various stages for export purpose and very little finished leather for domestic consumption. However, the local tanning industry have rather suffered from both poor quality and limited supply of the raw material, especially skins. The net supply of raw hides & skins appear to be far below the aggregate demand of the existing 18 tanneries that utilize about

65.8 per cent of their total processing capacity (CSA, 2000). The tanning industry is operating at much below full capacity due to mainly lack of demand and partly shortage of the raw material inputs (hides & skins). The latter is due to absence of effective marketing network between households (great proportion of raw material suppliers) and factory gate points. This result appears to have not satisfied the demand in the leather-manufacturing sector and it could create a retarding pressure on the export sector.

The increasing number of rural tanners associated with high demand for the raw materials for making traditional household items; wastage due to lack of awareness, weak extension services, inefficient recovery results from poor infrastructure, marketing facilities and discriminatory prices in favors of quality supplies exacerbated the shortage of hides & skins supply to the local tanning industry. The study (Berhanue & kibre) concluded that poor quality and shortage of the raw hides & skins, among other fundamental problems of the leather sector, have contributed for declining productivity and competitiveness and there by resulted in low export demand and under capacity operation.

Mahtab (1997) observed the global market trends that indicate clear prospect of expanding production in leather & leather goods industries. Both the tanning and shoe making industries have tended to gravitate towards low-labour-cost producers, as confirmed by the enormous upsurge of shoe making in China. He argued that the making of footwear is relatively straightforward operation and inevitably attracts considerable interest from low labour cost countries. From 1978 to 1990, there was a significance shift of shoe making share on a global scale from developed to developing economies, accounting for around 24 and 53 per cent in 1978, which changed to 18 and 69 per cent in 1990 respectively. The main benefactors of

these shift was Asia, which increased its share from around 40 to 60 per cent over that period. The most successful exporters of leather garment, South Korea, also benefited from export of shoe based on even from almost entirely imported leather.

The international market for footwear is highly competitive and strongly fashion conscious. According to World Bank (1987), Ethiopian products, although well manufactured, suffer from deficiencies in terms of design, style, weight and overall finish. The local producers of shoe, leather garments and other items have faced difficulties of insufficient supply of leather and required thickness, texture, finished and colour that meet export standard. The local tanneries have long engaged mainly in the production of semi-processed from higher quality of hides & skins for export and no sufficient efforts have been made in producing adequate and quality leather for local production of various finished leather products.

With respect to shoe industry, the most common problems are poor quality of domestic leather and high cost of imported inputs such as shoe accessories due to high tariff rates and depreciation of domestic currency. As a result, most firms are not competitive even in the domestic market and very few large producers of shoe have exported 10-15 per cent of their products to neighboring countries and the Middle East where tastes and quality requirement are very similar to the domestic market (World Bank, 1997).

Similarly Bangladesh had been processing high quality of hide & skins for export and produced leather shoe using low-grade domestic leather. Consequently, the products were found under international standard. However, since 1990, the country has made a modest effort to increase its production and export of leather goods, apart from footwear. Today it

also produces leather garments, briefcases, travel bags, wallets, jewellery boxes and golf bags, to name a few. The exports comprise top-grade leather while the local market is supplied mainly with lower-grade and rejected leather. As a result, the sector is still an important foreign exchange earner for the country; accounting for 10.7 per cent of the total (Mahtab, 1997).

Quality is neither topic nor recent interest nor a fashion. It is and has always been a problem of interest, essential for a firm's and to nation competitiveness. Tapiero (1996) argued that a firm to be competitive in the international market; it must produce quality goods and services. This means that firms to remain competitive must at the same time produce at least cost possible or differentiated products that command premium price and deliver high quality products and services. Hadley (2001) stated that "...the strength of demand for quality leather in high income countries.....will lead to increase in the price premium for quality."

The status of rawhides & skins and their final products depend on the live animals management, slaughtering, flaying technique employed, preservation, and storage and transportation methods used. The quality of raw stock and leather is primarily defined by the absence or intensity of damages/defects inflicted that hides & skins acquire during pre and post-mortem live cycle of animals. The majority of grain defects on hides & skins are preventable but they are not revealed until the hair or wool is removed, i.e. after partial processing. The causal agent may not be perceived to be sufficiently important to merit remedial attention that eventually enable the manufacturers profitably produce for various purpose. Defects are recognized as surface blemishes like scars& scratches, bacterial putrefactions & grain indentations, flay marks, deformation, thinner and lack of substance that

considerably depreciate the values of the products and as a consequence farmers, traders, and tanners face great financial losses and reduce foreign exchange earning of a country.

Most of the defects arise from exposure of live animals (pre-mortem) to natural and mechanical damages that play great role in determining certain qualities of hides & skins. The natural cause includes differences in environmental, biological conditions and microorganisms such as bacteria, fungi, viruses and parasite while mechanical causes are those defects like brand marks, scratches, scars and bruises.

The environmental conditions include variations in climate, geography and feeding of animals. Those skins from cooler Ethiopian highlands are found a bit thinner, less greasy and much stronger in fine grain structure than that of lowlands. The changes in seasons contribute for the emergence and reproduction of microorganisms that have sizeable impact on quality with respect to substance of raw stock. A well-fed animal yields better quality raw materials than starving animals whose skins normally ends up as rejects after tanning.

The process of increasing efficiency of curing and the quality of hides & skins products being not with curing itself but with the method of efficient handling and skinning from carcass. Once the hides & skins have been removed, the immediate handling of post-mortem is the other critical period for maintaining quality. The post-mortem defects could arise during slaughtering, storage, preservation and transportation of rawhides & skins.

In Ethiopia, hides & skins damages are common from inappropriate flaying mainly due to lack of experience of people who are doing the job. The recent study reviews the status of the

country's hides & skins quality and identifies the major defects and damages down grading the value of rawhide & skins. The result indicates the man-made defects resulting from mal-use of knives represents the major share of all the defects/damages (LMA, 2001). Similarly those hides & skins collected from all regions of the country and arrived at Awash Tannery during 1986/87- 1990/91 were investigated for all sources of defects. It was found that knives related damages stood at the second; accounting for 33 and 36 per cent for salted sheep skins and dry hides respectively while it was the first with 39 per cent for salted goat skins (Ahmed, 2001).

Hides & skins require being preserved immediately after skinning with the methods of wet salting or frame drying. However, fresh hides & skins without being preserved can be supplied directly to the tanneries that located close to the source of raw materials. Air-drying is the traditional system of preservation in Ethiopia while wet salting has been introduced to the country about two decades ago. Hence, most hides & skins are removed and initially treated with salt in town slaughterhouse while those from rural market are not. As the method of salting or frame drying is not practiced fully all over the country, some of the hides & skins suffer from air slips, mould and bacteria attacks. In 1990, out of the total hides & skins reaching local tanneries, about 80 and 25.6 per cent of sheep and goatskins respectively while 4.4 per cent of hides were wet salted. Likewise about 14.4 and 73 .6 per cent of sheep and goatskins were air-dried and air-dried hides accounted for 77.8 per cent. Regarding fresh wet hides & skins, they shared about 5.6, 0.8 and 17.8 per cent of sheep and goatskins & hides respectively (NLSC, 1990).

The supply of export depends on their profitability in production and marketing. In the literature, export supply function is assumed to depend on a) domestic currency price of export goods relative to the price of domestic goods, b) domestic demand pressure, c) output capacity of the economy and d) foreign trade taxes. A domestic price can be used as another independent variable in the model to reflect the cost of production of export goods, domestic selling price of exportable and import competing goods and price level of non-traded goods (when resources involved in production are transferable to non-traded goods sectors). Instead of using these two prices as independent variables separately in the model, the relative price has been used (World Bank, 1987).

The export supply model does not include the exchange rate as an explanatory variable rather it figure implicitly as a factor determining export in the supply equation. A change in the exchange rate would thus influence export through its impact on prices and unit profit received by the exporters. It would alter the relative price of exportable, which in turn may strengthen or weaken the impact of any given domestic credit expansion on export performance. For instance changes in the relative prices of exportable would, other factors remaining the same, reduce or raise the volume of domestic consumption. Such absorption effect would add or diminish the availability of exportable for the world market.

In an economy with any quantitative restriction on external trade, any increase in aggregate absorption relative to output of goods would erode the availability of exportable for the world market and thus implicitly draws attention to demand management as an important element of foreign trade policy. It implies that generally the adverse effect of increasing nominal absorption on export over time can be offset, partly or wholly, through rising prices received

by exporters as a result of country trade policy, world demand and international price trends for the export basket. Finally, it implies a coordinated rather than a piecemeal approach to export development.

The demand for exports from a particular country would depend not only on the world demand curve but also on that country's competitiveness, that is, its export price relative to that of the competitor countries. More precisely, the country specific price elasticity would be a combination of the price elasticity of the world demand and the relative price elasticity of its market share. Ajit (1992) argued that a small country share of the world market would strengthen the responsiveness of the export to promotional efforts because of the likely absence of strong retaliation from competitors. Whatever the size of the country share, exporters should generally find it easier to expand sales in a growing world market rather than in a stagnant one. Given the estimated elasticity of demand for exports with respect to world income, this expectation appears to be well founded. This elasticity is close to unity, as the low standard error shows, rather stable. This implies that, price competitiveness remain more or less unchanged; the volume of exports should grow in step with the world economy.

World Bank (1987) attempted to estimate Ethiopian major export supply response with respect to change in relative unit value, real GDP, real exchange rate, export tax and domestic consumption. The result indicates that only export tax and domestic consumption are statistically significant variables at 10 per cent level while the rest variables are not significant; nevertheless all but the real exchange rate have the expected signs. The exchange rate elasticity of the exports was found  $-0.16$  and that of price, domestic consumption and real GDP variables were  $0.12$ ,  $3.78$  and  $1.07$  respectively.

## CHAPTER FOUR

### METHODOLOGY

#### 4.1. Model Specification and Description

The present study follows the structure of export supply model derived by Goldstein and Khan (1978) where export supply equation in log linear form is defined as a function of relative price, domestic demand pressure relative to output and production capacity of a country.

Specifically, the model is of the form:

$$\ln X_t = \beta_0 + \beta_1 \ln (P_x/P)_t + \beta_2 \ln Y_t + \beta_3 \ln (X_d)_t \text{-----(4.1)}$$

Where Ln denotes natural logarithm

$X_t$  = quantity supply of export goods in the current period

$P_x/P$  = the relative price of the export in domestic currency (i.e., the unit values ( $P_x$ ) realised by exporters are deflated by index of consumer price ( $P$ ))

$Y$  = domestic production capacity

$X_d$  = domestic demand pressure

$\beta_i$  ( $i = 0, 1, 2$  and  $3$ ) are coefficients

The relevant own price in the export supply function is the price actually received by the exporters inclusive of all subsidies and/or taxes for exporting. The export supply specification considers the importance of domestic absorption as a major phenomenon inhibiting rapid export growth over long period. A country's ability and willingness to supply export may not be fully captured by the relative price of export and domestic demand pressure but also depend on the output capacity of the economy. In other words, secular changes in real output will improve factor supplies, infrastructure and total factor productivity that will lead to an

increase in export supply at any given level of export price. Therefore, a real gross domestic product (GDP) could be used in the model as a measure of output capacity of a country.

However, model 4.1 can be further specified as:

$$\ln X_t = \beta_0 + \beta_1 \ln(P_x)_t + \beta_2 \ln E_t + \beta_3 \ln Y_t + \beta_4 \ln(X_d)_t + \beta_5 \ln(X_w)_t + \beta_6 D_1 + \beta_7 D_2 + U_t \text{-----4.2)}$$

Where  $X_t$  = quantity supply of export goods in the current period.

$P_x$  = foreign unit value (USD/kg)

$E_t$  = real exchange rate

$Y_t$  = Real Gross Domestic Production (RGDP)

$X_d$  = volume of domestic consumption

$X_w$  = volume of world supply from major exporters.

$D_1$  = a dummy variable that takes on unity for the period 1966-1991 and zero otherwise

$D_2$  = a dummy variable which takes on unity during the period in which top qualities exceed 50 per cent and zero otherwise

$U_t$  = stochastic error term with mean zero and constant variance to capture measurement error and other random disturbances

$\beta_i$  ( $i = 0, 1, 2, 3, 4, 5, 6$  and  $7$ ) are parameters to be estimated and  $t$  is time period.

The model attempts to include foreign unit value, a proxies of unit price, as independent variable to explain the change in supply of the exports under study. This is based on the assumption like any ordinary goods in the market; the supply is expected to relate directly to price, as producers/exporters are most likely to respond to price signals. The local real exchange rate, as independent variable in the model, could capture the relative profitability of the export commodities with respect to competing domestic consumption through its effect on

domestic relative price to change and resource re-allocation. Hinkle and Montiel (1999) considered real exchange rate as the most crucial determinant of international competitiveness of manufacturing sectors in developing countries through its effect on transaction costs.

As a result of marketing and pricing policies in the command economic policy period (1974-91) in Ethiopia, the domestic demand pressure on the exports cannot be well captured by the price variable. Instead the ratio of value of local consumption to total value of leather products from the domestic manufacturing industry is employed to represent the trend of local consumption. For the domestic output capacity, a real GDP is included in the model as a proxy to measure production capacity of the economy.

Ethiopia is a price taker in almost all of its export commodities and the world price of the Ethiopian leather exports could be dependent on the supply from major world exporters. As a result, the country's quantity supply and price booms are associated with some form of supply shortfall of these countries to the world market. Hence the ratio of exports earning of these countries to total world value of the sector to indicate the trend in quantity supply is included in the model

The sample period of the time series data used in this paper encompasses radically different policy regimes. During the command economic policy period (1974-91), the growth of Ethiopian export sector was limited largely by government policies. As a result, the sector was uncompetitive and lost its demand in the international market. As part of the economic policy reform, a number of external trade policies have been liberalized and underway since 1992. The objective of the reforms is to enhance the export growth particularly through

private active participation in the world trade flows. The impact of these policy shifts would be captured through a dummy variable in order to consider the potential effect on the performance of the export under review. Fosu (1992) employed a dummy variable, representing policy shift, in his estimation of the Ghana's exports of aggregate agricultural products, coffee, cocoa and sheanuts supply equations. He found insignificant parameters for the dummy variables of the first three exports while statistically significant result for export of sheanuts.

Moreover, in this competitive world, the concept of quality is on the rapid truck of change and development particularly in the industrial sector from time to time. That is the demand for exports largely depends on worldwide quality standard of the products to satisfy the consumers. In this sector, a number of studies cited in chapter two, identified that the Ethiopian leather sector standard has been gone down below 50 per cent since late 1980s. Thus a dummy variable is introduced in the present model to consider the effect of quality changes.

The model embodies the hypothesis that over-valued exchange rate, poor quality of exports, and high domestic demand are combined together to explain slow supply response by export producers in the international markets. As the price of the exports rises, exports become more profitable and hence exporters supply more. Given prices, the motivation for making additional revenue is reflected by raising the level of output and hence supplying more to the market. In addition exports are posited to rise and decline, *ceteric paribus*, when there is an independent increase in domestic production capacity and supply of leading world exporters

respectively. Thus the specification of the supply model attempts to explain the response of export supply in terms of changes in these variables.

#### **4.2. Data Collection**

The study uses annual time series data for the period 1966-2000. The main sources of the data are government institutions and publications of international organizations. These include National Bank of Ethiopia (NBE) for export supply of leather commodities, Ministry of Finance and Economic Development (MoFED) for real GDP and real exchange rate, Central Statistics Authority (CSA) for domestic consumption of manufactured leather goods and United Nation Conference on Trade and Development (UNCTAD) for export value earnings from leather sector.

## CHAPTER FIVE

### ESTIMATION OF THE MODEL AND ANALYSIS OF RESULTS

Before going further in to time series econometric procedures, a simple ordinary least square (OLS) method is employed for estimating the export supply equation of the present study. The results of the regression equation together with various diagnostic tests are reported in table 5.1 below.

Table 5.1 Results of preliminary regression

Variables	Coefficients	Standard error	t-value	t-prob.	Test of Summary
Constant	2.272	4.392	0.517	0.609	$R^2 = 0.62$ , Stad deviation = 0.20 DW = 1.76, RSS = 1.10 $F(7,26) = 6.11[0.0003]$ AR 1-2 $F(2, 24) = 0.216[0.807]$ Normality = 6.11 [0.0003] AR 1- $\chi^2(2) = 1.873[0.391]$ $\chi^2 F(12, 13) = 0.839[0.615]$ RESET $F(1,25) = 2.111[0.158]$
$\ln P_x$	0.079	0.152	0.521	0.324	
$\ln E$	0.213	0.212	1.006	0.324	
$\ln Y$	0.578	0.472	1.225	0.232	
$\ln X_d$	-0.542	0.189	-2.861	0.008	
$\ln X_w$	-0.340	0.520	-0.654	0.519	
$D_1$	0.481	0.145	3.323	0.003	
$D_2$	0.274	0.112	2.451	0.021	

The regression output shows that domestic consumption ( $X_d$ ), policy difference ( $D_1$ ) and quality status ( $D_1$ ) variables are found statistically significant implying the respective coefficient is different from zero and all the signs are as per expectation. The F-test is significant suggesting the overall significance of the model and the explanatory variables together account for about 62 per cent of the variation in the supply of leather exportable items. However, a great deal of applied econometric works use time series data, which are uniquely associated with numerous econometric problems. These series exhibit periods of unusually large volatility followed by phase of relative tranquility. That is they may have a mean that change with time and a non-constant variance; working with such series in their

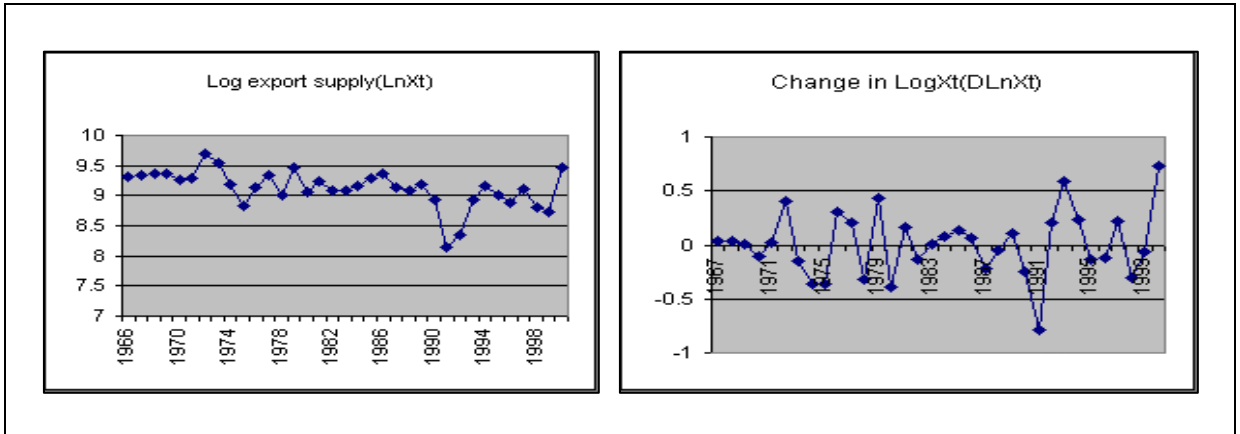
level will give a high likelihood of spurious regression results for which no inferences can be done since the standard statistical tests like the F- distribution or t-distribution are invalid.

Enders (1995) argued that if two variables trend upward, a regression of one on another is very likely to find a significant relationship between them, even if the only thing they have in common is the upward trend. Therefore, the conventional econometric regression model necessitate that all the series included in a model be stationary and the disturbance term is assumed to have zero mean and constant variance. The present study utilizes time series data for analysis purpose however the variables included in the model, like any other series; most likely possess the problem of non-stationary. The distribution of the variables may change through time so that the mean and variance could not be constant rather depend on the point in time at which every observation of each of the series was made. That is, they may have a mean that change with time and a non-constant variance.

The graphical representations of the variables are provided below in figure 5.1a-5.1f. Inspection of the plots suggests that all the variables seem linearly trended series at their level while the respective first difference look like stationary.

The supply of leather goods export in figure 5.1a looks more or less stable except during two periods in which the supply exhibited relatively significant decline and then growth. The first is 1972-75 in which the supply fell, on average, by 46 per cent per annum and thereafter rose to maximum in 1979 during the command economic policy period. The second period covers from 1989-91 in which the exports supply declined, on the average, by 32.5 per cent and grew by 21.3 per cent per annum in 1991-94 and then declined by 8.5 per cent during 1995-1999.

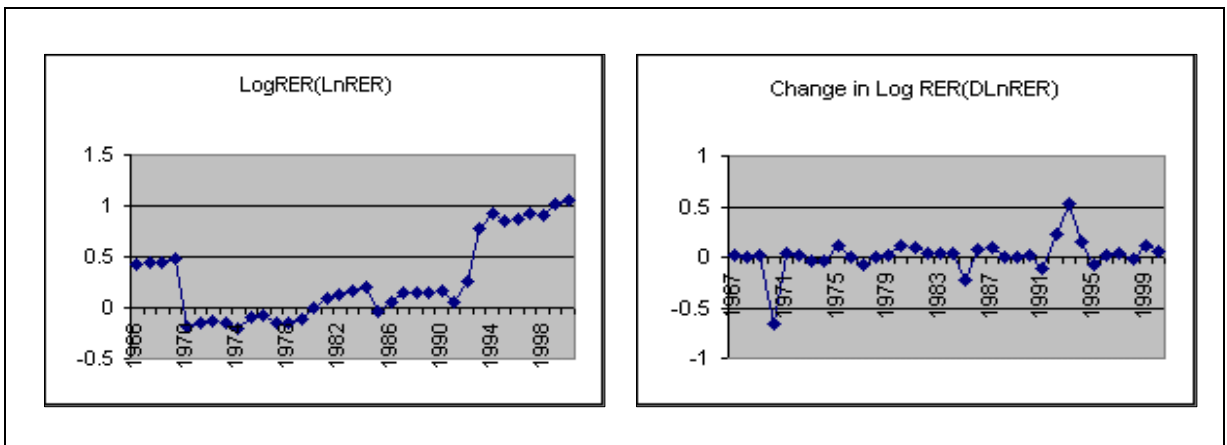
Figure 5.1a Volume of leather exports



If we look at what happened to these periods, there were shifts of economic policy from relatively free market to command system in the first period and again to free market-oriented system in the second period. These multiple trends of the export supply during the various periods suggest the presence of non-stationary behavior during the sample period.

Similarly we can clearly observe two periods during which the exchange rate, in real term, depicts relatively significant changes, which is shown in figure 5.1b below.

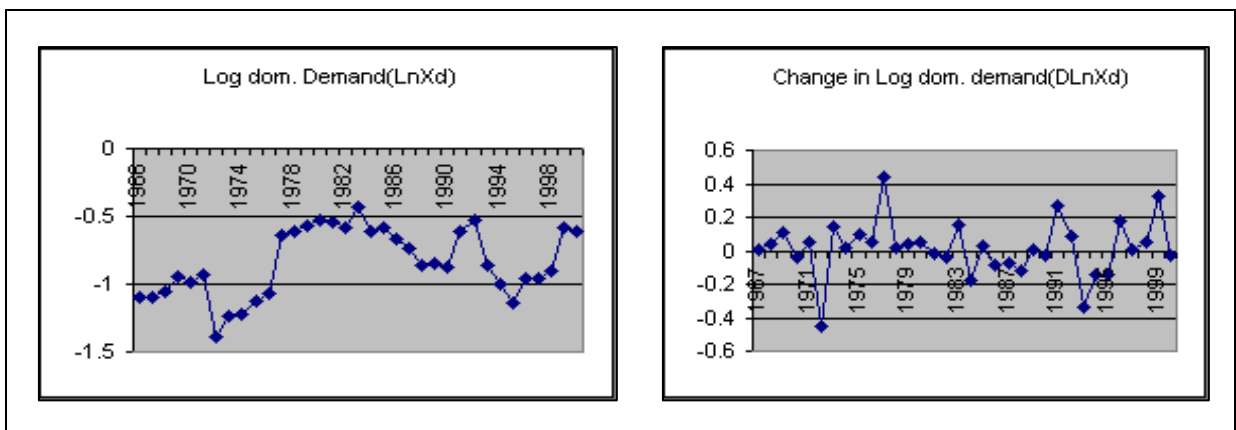
Figure 5.1b Real exchange rate



These periods are associated again with the changes in economic management. In the period 1970-74 the real exchange rate short fell resulting from the revaluation of the nominal exchange rate from birr 2.5 to 2.07 per US dollar. During the command economic policy period (1974-91), the real exchange rate rose very slowly as the nominal exchange rate was fixed at birr 2.07 per US dollar at all time indicating the birr had been appreciated in real term against foreign currency. In 1992, the real exchange rate rose sharply resulting from devaluation of the birr from 2.07 to 5.00 per US dollar. The exchange rate auction market system (weekly and biweekly) has been in place since 1993 and the real exchange rate has been deprecating slowly. These changes of trend provide evidence that the real exchange rate seems non-stationary at its level.

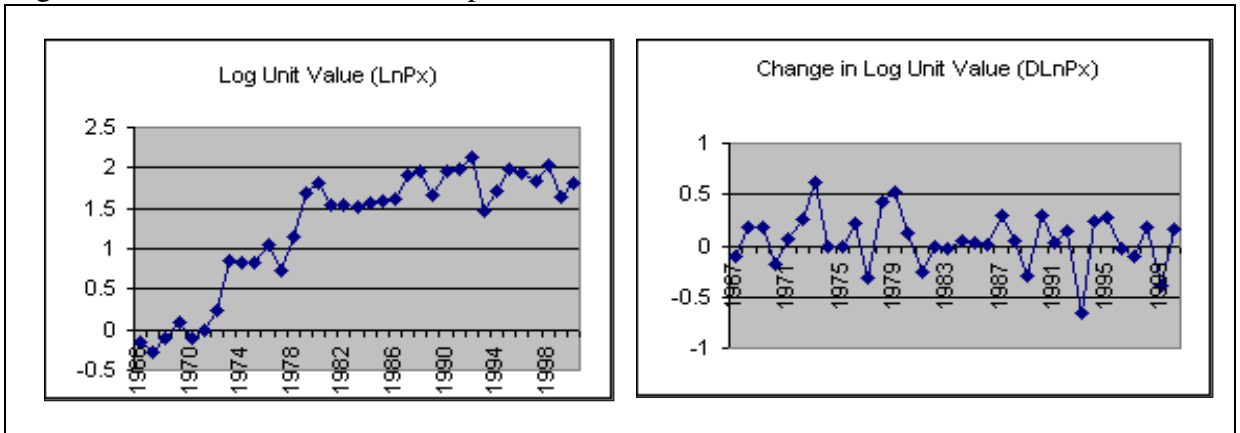
The domestic consumption variable reflects similar characteristics. We see a relatively sharp decline and then growth during the periods when shifts in economic policies took place. The series seems to through sustained periods of increase and decrease with no tendency to return to long run mean. This type of “random walk” behavior, shown in figure 5.1c below, is typical of non-stationary at its level.

Figure 5.1c Trend in volume of domestic consumption



In figure 5.1d below, unit value of leather export goods has shown fluctuation wildly but grew upward trend indicating the presence of non-stationary characteristics of the variable at its level.

Figure 5.1d Unit value of leather exports



The real GDP and world supply variables seem smoothly trend upward and look like non-stationary at its level. They exhibit decidedly upward trend. For these series, the positive trend is interrupted by a marked decline, followed by a resumption of the positive growth. Then it is hard to maintain that these series do have a time-invariant mean and as such they look like non-stationary at their respective levels. The trends of these variables are presented below in figure 5.1e and 5.1f respectively.

Figure 5.1e Real Gross Domestic Product

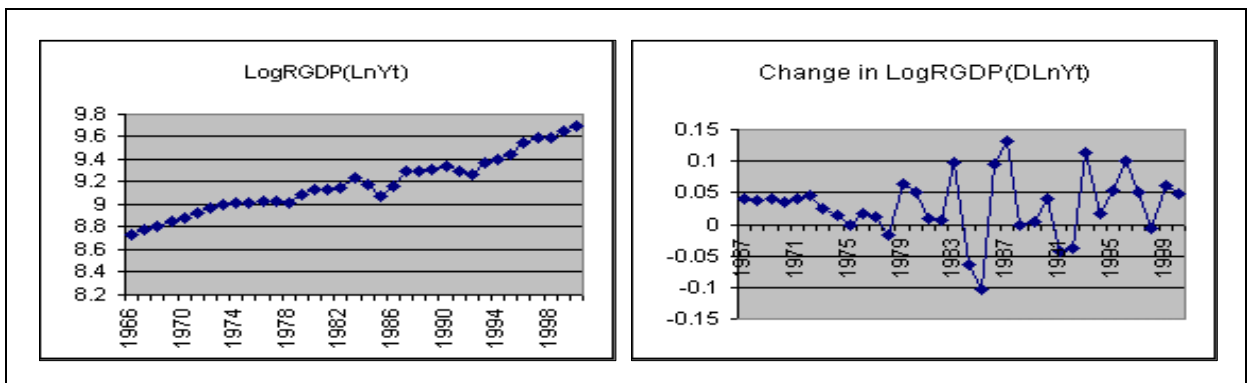
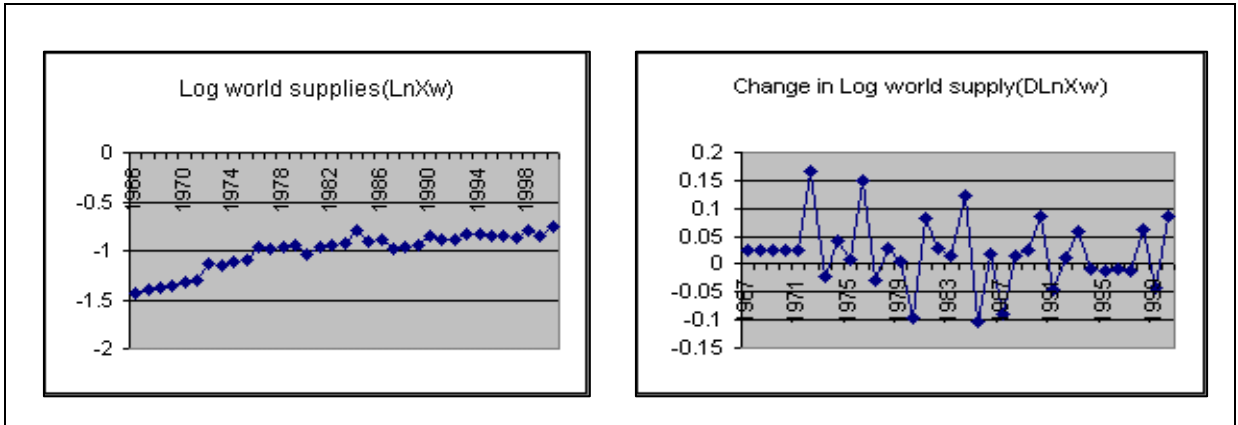


Figure 5.1f Trend in world leather supply from major exporters



Given that the variables that appear to have a non-constant mean it implies that they are not stationary in levels. Plots of the first differences, in contrast, show no evidence of changing means or changing variance. Thus the use of graphical evidence is unreliable in making inference about the presence of unit roots, and it is better to turn to the formal testing strategies that examine each of the series for the unit root.

### 5.1 Unit root test

The simplest and most widely used for unit root tests were developed by Fuller (1976) and Dickey and Fuller (1979). These tests are generally referred as Dickey-Fuller (DF) tests. The null hypothesis for these tests indicates that the series are non-stationary against the alternative stationary and is rejected only when there is overwhelming evidence against it at the conventional level of significance.

Note that the DF test assumes that the errors are independent and have a constant variance. This raises an important problem related to the fact that a researcher does not know the true data generating process. The true data generating process may contain both autoregressive and

moving average components. The DF test considers only a single unit root. However, a  $p^{\text{th}}$  order auto regression has  $p$  characteristic roots; if there are  $m \leq p$  unit roots, the series needs to be differenced  $m$  times to achieve stationary, i.e. not all time series processes can be well represented by the first order auto regression process. On the other hand, the true order of autoregressive process is usually unknown so that the problem is to select the appropriate lag length. Therefore, the true data generating process employs Augmented Dickey-Fuller (ADF) tests that include higher order autoregressive.

For convenience, the parameter estimates and test of statistic reported below are derived from DF and ADF tests in which trend and constant are included and the dependent variable is expressed as first difference. Unless stated otherwise, all hypothesis tests are conducted at 5 per cent level of significance.

Table 5.2 Unit root test for order of integration

a) Variables at level

Var.	LnX	LnP <sub>x</sub>	LnE	LnY	LnX <sub>d</sub>	LnX <sub>w</sub>
DF	-3.52	-1.89	-1.98	-2.35	-2.09	-2.41
ADF	-3.90	-1.75	-4.05	-4.20	-2.27	-2.25

b) Variables at first difference

Var.	$\Delta$ LnX	$\Delta$ LnP <sub>x</sub>	$\Delta$ LnE	$\Delta$ LnY	$\Delta$ LnX <sub>d</sub>	$\Delta$ LnX <sub>w</sub>
DF	-5.49	-6.83	-5.48	-5.47	-5.75	-8.22
ADF	-5.46	-6.25	-5.44	-7.57	-5.65	-4.42

$\Delta$  = first difference, Critical values at 1 % DF = -4.26, ADF = -4.27  
5% DF = -3.55, ADF = -3.55

Given the variables considered in this study, the results of unit root tests for stationary suggest that all the variables contain a single root and so are integrated at the same order, i.e. I (1).

## **5.2. Co-integration Analysis**

The coefficients of a regression equation of the differenced non-stationary variables provide us a short run dynamic analysis. This, however, throws away potential valuable information of the long-run relationship between variables. The theory of co-integration addresses the issue of integrating short-run dynamic with long-run equilibrium. The concept of co-integration is fundamental to the understanding of long-run relationship among economic time series.

By definition, co-integration necessitates that all variables of a model to be integrated of the same order. Of course, this does not imply that all similarly integrated variables are co-integrated. Such a lack of co-integration implies no long-run equilibrium among the variables, so that they can be wandering arbitrary far from each other. If the variables are integrated of different order, it is impossible to conclude that they are co-integrated. But in fact it is possible for two or more variables to be  $I(1)$  and yet for certain linear combination of these variables to be  $I(0)$ . If that is the case, they are said to be co-integrated and must obey an equilibrium relationship in the long run although they may diverge substantially from equilibrium in the short run.

Any equilibrium relationship among a set of non-stationary variables implies that their stochastic trends must be linked. After all, the equilibrium relationship means that the variables cannot move independently of each other. This linkage among the stochastic trends necessitate that the variables be integrated. Since the trends of co-integrated variables are linked, the dynamic paths of such variables must bear some relation to the current deviation from equilibrium relationship. If co-integration is established, the relationship between the

independent and the dependent variable will be most efficient, represented by the error correction model. The error correction specification will not only facilitate the analysis of the short run impacts on the dependent variable, but also suggest the speed of adjustments to long-run equilibrium. This involves testing the null hypothesis that assumes the residual series from co-integrating regression has a unit root against an alternative that the series is stationary, i.e., the null hypothesis is non co-integration and the alternative hypothesis is co-integration.

The most popular tests for co-integration, which are closely related to unit root tests, were suggested by Engle and Granger (1987). The basic idea is that if the variables are co-integrated, the true equilibrium error term must be  $I(1)$ . Thus one can test the null hypothesis of non co-integration against the alternative of co-integration by performing a unit root test on the error term. Although the Engle and Granger (EG) procedure is easy to implement, it does have important defect, i.e., the tests are conducted for the presence of only unique co-integrating vector and they are not in general efficient to detect the existence of more than one co-integrating vector. In fact, if there are  $n$  variables in a model, there may be  $n$  co-integrating vector or less. Fortunately, several methods have been developed that avoid these problems (Davidson and Mackinnon, 1993).

One of the most interesting approaches, for full-system model in co-integration test, was developed by Johanson (1988, 1991). The approach circumvents the Engle-Granger's serious defect and tests for the presence of multiple co-integrating vectors. Moreover, it allows a researcher to test restricted versions of the co-integrating vector(s) and speed of adjustment parameters. This approach is employed in the present study to consider the number of co-

integrating vectors that actually exist between the variables. Under this procedure the variables for the model is represented by defining a vector  $H_t$ . Where  $H_t$  is vector auto-regression (VAR) involving up to  $p$  lags. The VAR model can be written as:

$$H_t = H_{t-1}\Pi_1 + \dots + H_{t-p}\Pi_p + U_t \text{ -----(5.1)}$$

Where  $H_t$  and  $U_t$  are  $1 \times m$  row vectors and  $\Pi_1$  through  $\Pi_p$  are  $m \times m$  matrices of coefficients, the error term  $U_t$  is independently and normally distributed with mean of null vector of zero and vector variance. The VAR model (5.1) can be reparametrized as:

$$\Delta H_t = \Delta H_{t-1} \Gamma_1 + \dots + \Delta H_{t-p+1} \Gamma_{p-1} - H_{t-p} \Pi + U_t \text{ -----(5.2)}$$

Where  $\Gamma_1 = \Pi_1 - I$ ,  $\Gamma_2 = \Pi_2 + \Gamma_1$ ,  $\Gamma_3 = \Pi_3 + \Gamma_2$  and so on.

$\Gamma$ 's = contains information of the short run adjustment to changes in  $H_t$ .

$\Pi$  = contains information on the long run adjustment to changes in  $H_t$ .

Thus the matrices  $\Pi$  is related to the  $\Pi_i$ 's of (5.1) by:

$$\Pi = I - \Pi_1 - \dots - \Pi_p$$

Suppose that  $\Pi$  has rank of  $r$ , such that  $0 < r < m$ . If that is the case, we can write as:

$$\Pi = \alpha\beta' \text{ -----(5.3)}$$

Where  $\alpha$  and  $\beta'$  are  $m \times r$  matrices.  $\alpha$  represents the speed of adjustment to disequilibrium and  $\beta'$  is a matrix of long run coefficients such that  $\beta'H_{t-p}$  embodied in (5.3) denotes up to  $(m-1)$  co-integration relationships in the multivariate model which ensure that  $H_t$  converge to their long run steady state solution. The table below presents statistic results on the number of co-integrating vectors. The results suggest the presence of a single co-integrating relationship between the variables.

Table 5.3 Test of the co-integration rank

Ho: rank = p	$\lambda_{\max}$	95%	$\lambda_{\text{trace}}$	95%
p<=0	52.21**	44.0	134**	114.9
p<=1	32.62	37.5	81.81	87.3
p<=2	20.95	31.5	49.19	63.0
p<=3	14.45	25.5	28.24	42.4
p<=4	9.98	19.0	13.79	25.3
p<=5	3.81	12.3	3.81	12.3

The test for the number of characteristic roots that are insignificantly different from unity can be conducted using  $\lambda_{\max}$  and  $\lambda_{\text{trace}}$  test statistics. The first status tests the null hypothesis that the number of co-integrating vectors is r against the alternative of r+1. The second statistic tests the null hypothesis that the number of distinct co-integrating vector is less than or equal to r against a general alternative. Thus, the null hypothesis of co-integrating vector is rejected while the number of co-integrating vectors at most equal to one cannot be rejected.

Table 5.4 Results of co-integration analysis

a) Standardize  $\beta'$  eigenvector

LnX	LnP <sub>x</sub>	LnE	LnY	LnX <sub>d</sub>	LnX <sub>w</sub>	Trend
1.0000	-0.3635	-0.7901	-0.6025	0.1724	0.8628	0.0256
0.4494	1.0000	1.1930	-5.2722	0.0656	-3.2872	0.1235
0.1725	0.1048	1.0000	-2.1653	-1.0406	1.9081	0.0394
0.0054	0.2201	0.2077	1.0000	-0.4420	-0.2917	-0.0321
1.0992	0.8093	0.8516	5.7811	1.0000	-4.1757	-0.0288
0.4207	0.1073	0.1363	1.3953	0.6170	1.0000	-0.0637

b) Standardize  $\alpha$  eigenvector

LnX	-0.3662	0.2753	-0.1344	-0.7969	-0.0808	-0.2299
LnP <sub>x</sub>	0.4756	-0.3057	-0.1147	-1.0995	0.0572	0.0641
LnE	0.2011	-0.0882	0.0321	0.4804	0.0043	-0.1130
LnY	0.0240	0.0640	0.0201	0.1869	-0.0008	-0.0517
LnX <sub>d</sub>	-0.1507	-0.0064	0.3322	0.4302	-0.0042	0.0483
LnX <sub>w</sub>	-0.0579	-0.0032	-0.0717	0.0224	0.0297	-0.0293

Number of lags used in the analysis: 1  
 Variables entered unrestricted: D<sub>1</sub>, D<sub>2</sub> and Constant  
 Variables entered restricted: Trend

From co-integration analysis of table 5.4a, the entries in the first row of the vector represents the long run parameters or elasticities that all are consistent in sign with economic theory expectation. The equation can be written as:

$$\text{LnX}_t = 0.36\text{Ln(P}_x)_t + 0.79\text{LnE}_t + 0.60\text{LnY}_t - 0.17\text{Ln(X}_d)_t - 0.86\text{Ln(X}_w)_t - 0.02T$$

Table 5.5 Tests for significance of long run parameters

	LnP <sub>x</sub>	LnE	LnY	LnX <sub>d</sub>	LX <sub>w</sub>	Trend
β-coefficients	-0.3635	-0.7901	-0.6025	0.1724	0.8628	0.0256
LR-test	4.8676	9.703	0.5682	1.2902	2.7584	1.3216
P-values	0.0274*	0.0018**	0.4509	0.2560	0.0967	0.2503

\*\* significance at 1% .

\* significance at 5%.

For conditional inference to be valid, all explanatory variables must be predetermined or exogenous. This test for the present study is conducted by imposing zero restriction on the α-coefficients using the loglikely ratio (LR-ratio). This is in order to ascertain whether any of the explanatory variables are actually endogenous.

Table 5.6 Tests for exogeneity

	LnP <sub>x</sub>	LnE	LnY	LnX <sub>d</sub>	LX <sub>w</sub>
α-coefficients	0.2753	-0.1344	-0.7969	-0.0808	-0.2299
LR-test	4.2739	4.8519	0.3022	1.0881	1.3119
P-values	0.0387*	0.0276*	0.5825	0.2969	0.2520

From the results of exogeneity tests above in the table 5.6, unit price and the real exchange rate are found to be weak exogenous at 5 per cent significance level. Therefore, a test is conducted using Granger causality test to see whether the dependent variable (LnX<sub>t</sub>) actually

Granger-cause each of these variables ( $\text{LnP}_x$  and  $\text{LnE}$ ) independently. The result is presented in appendix C where the dependent variable does not Granger-cause the price and real exchange rate variables.

### **5.3 Estimation and interpretation of results**

Once the existence of unique co-integration has been proved; the next procedure is the formulation of a dynamic model. Any regression model in which the function depends on lagged values of one or more dependent variables is called a dynamic model. The dynamic short run model represents a system or vector error correction and is the result of general model, which is a fairly unrestricted model that can be transformed and reduced in size by performing various tests for restrictions. The general model is usually described in an autoregressive distributed lag (ADL).

One interesting and important feature of ADL models is that they can be rewritten in many different ways without affecting their ability to explain the data or changing the least square estimates of the coefficients of interest. In attempt to specify dynamic regression model, it should be noted that there are generally a great many priori plausible ways to do so and it is mistaken to limit attention to one particular type of model. In order to obtain a reasonably parsimonious and readily interpretable model, it is generally necessary to impose a number of restrictions on the initial ADL specification (Davidson and Mackinnon, 1993).

Accordingly, it is attempted to develop an appropriate error correction model (ECM) for short run analysis of the export sector under review. The error correction model is represented as:

$$\Delta \text{LnX}_t = \beta_0 + \beta_1 \Delta \text{Ln(P}_x)_t + \beta_2 \Delta \text{LnE}_t + \beta_3 \Delta \text{LnY}_t + \beta_4 \Delta \text{Ln(X}_d)_t + \beta_5 \Delta \text{Ln(X}_w)_t + \beta_6 \text{D}_1 + \beta_7 \text{D}_2 + \gamma(\text{E}_{t-1}) + \epsilon_t$$

Where  $\Delta$  is first difference, E is error correction term and  $\epsilon$  denotes residual error term.

$\gamma$  = coefficient and the rest are defined as before.

The short run (error correction) model in different specification together with various diagnostic tests is reported in table 5.7 below.

Table 5.7 Results of the short run model

Variable	Model I	Model II	Model III	Model IV
Cons.	-0.05 (-0.55)	-0.05 (-0.79)	-0.003 (-0.06)	-0.002 (-0.03)
$\Delta \text{LnP}_x$	0.15 (0.92)	0.15 (0.96)	0.17 (1.08)	0.17 (1.06)
$\Delta \text{LnE}$	0.41 (1.11)	0.42 (1.19)	0.30 (0.90)	0.30 (0.85)
$\Delta \text{LnY}$	0.97 (1.10)	1.00 (1.21)	0.80 (0.99)	0.80 (0.93)
$\Delta \text{LnX}_d$	-0.81 (-2.82) <sup>1</sup>	-0.81 (-2.90) <sup>1</sup>	-0.75 (-2.73) <sup>1</sup>	-0.72 (-2.66) <sup>1</sup>
$\Delta \text{LnX}_w$	-1.82 (-2.33) <sup>2</sup>	-1.82 (-2.37) <sup>2</sup>	-1.62 (-2.17) <sup>2</sup>	-1.62 (-2.13) <sup>2</sup>
D <sub>1</sub>	-0.01 (-0.15)	—	—	-0.0012 (-0.014)
D <sub>2</sub>	0.09 (1.06)	0.09 (1.07)	—	—
E <sub>t-1</sub>	-0.92 (-3.73) <sup>1</sup>	-0.93 (-3.97) <sup>1</sup>	-0.91 (-3.90) <sup>1</sup>	-0.911 (-3.69) <sup>1</sup>
	R <sup>2</sup> =47.5 RSS=1.29 F(8,25)=2.83(0.02) $\sigma$ = 0.23 DW= 2.16 AR 1 - 2F(2, 23) = 5.31(0.013)* ARCH 1 F (1,23)= 0.52(0.48) Norm. Chi <sup>2</sup> (2) = 1.02(0.60) xi <sup>2</sup> F(14 , 10) = 0.87 (0.60) RESET F (1, 24) = 0.32(0.58) Total Obs = 34	R <sup>2</sup> =47.5 RSS= 1.29 F (7,26) =3.36(0.01) $\sigma$ = 0.22 DW = 2.14 AR 1 - 2F(2, 24) = 5.21(0.01)* ARCH 1 F(1 , 24)= 0.61(0.44) Norm. Chi <sup>2</sup> (2) = 1.27(0.53) xi <sup>2</sup> F(13 , 12) = 0.81(0.64) RESET F (1, 25) = 0.24(0.63) Total Obs = 34	R <sup>2</sup> = 45.7 RSS= 1.32 F (6,27) =3.70(0.008) $\sigma$ = 0.22 DW =2.05 AR 1-2 F (2, 25) = 3.19(0.06) ARCH 1 F (2, 25) = 0.38(0.542) Norm. Chi <sup>2</sup> (2) = 3.35(0.19) xi <sup>2</sup> F(12 , 14) = 0.53(0.86) RESET F (1, 26) = 0.0002(0.99) Total Obs = 34	R <sup>2</sup> = 45.2 RSS= 1.35 F (7,26) =3.06(0.02) $\sigma$ =0.22 DW = 2.05 AR 1 -2F(2, 24) = 3.08(0.06) ARCH 1F(1, 24)= 0.36 (0.55) Norm. Chi <sup>2</sup> (2) = 3.32(0.19) xi <sup>2</sup> F(13 , 12) = 0.48 (0.89) RESET F (1, 25) = 8.56(0.99) Total Obs = 34

Numbers in parenthesis are t- values,

<sup>1</sup>.significant at 1%, <sup>2</sup>.significant at 5%, \* residual autocorrelation

Model I indicates that all the independent variables have got the expected sign and only two variables ( $\text{LnX}_d$  and  $\text{LnX}_w$ ), other than error correction term, are found significant to explain the variation in the country's export of leather goods supply. Moreover, all the explanatory variables together account for about 47.5 per cent of the change in export of leather goods supplies. However, the model has suffered from residual serial correlation up to two lags and any interpretation based on such model leads to invalid conclusion. Then to reduce these insignificant results, relatively less important variables are dropped out from the model. Similarly, excluding each of the insignificant variables independently results in residual autocorrelation at 5 per cent (see Appendix D). Finally Model IV, where  $D_2$  is dropped out, the regression equation is employed for analysis and interpretation purpose.

As shown in table 5.5, the result of long run regression is that: -

- i) foreign unit value/price and real exchange rate variables are entered positively and significant in explaining the supply of leather export sector.
- ii) out put capacity (proxies by real GDP) is found positive but insignificant to stimulate the sector's export supply.
- iii) domestic consumption pressure and world supply entered negatively but insignificant to affect the export supply response.

The results of the short run (error correction) supply model indicate:-

- i) world unit value/price real exchange rate and domestic production capacity entered positively but insignificant to stimulate the supply of the export sector.
- ii) policy shift dummy variable entered negatively but has insignificant contribution to change the volume of leather export goods of the country.

iii) the domestic consumption pressure and world export supply variables are found statistically significant to affect the supply of the export sector under review. That is an increase in domestic consumption and/or world supply of leather goods would retard the growth of the export supply of leather goods of the country.

However all these explanatory variables together account for about 45 per cent of the variation for the supply of leather goods exports and the sign of all the coefficients are as per the expectation. The various diagnostic tests reported are customarily used to validate the estimated dynamic model without problems of that kind stated in their respective null hypothesis. These include AR (auto-regressive) test for higher order serial correlation up to two lags, ARCH (auto-regressive conditional heteroscedasticity) test for auto-regressive heteroscedasticity and normality test for the distribution of the residuals. These tests proved the absence of residual autocorrelation and heteroscedasticity as indicated by AR and ARCH tests respectively. The normality test shows that the residuals are normally distributed.

The coefficient of the error correction term has got the expected negative sign with a magnitude of 0.911 depicting a less than complete adjustment towards equilibrium. It tells us that about 91 per cent of the past period disequilibrium is corrected in the current period.

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATION**

Ethiopia has a relatively large livestock resource base, however its leather sector seems significantly lag behind many countries that are less endowed. That is, the country has not yet exploited this resource to any appreciative extent and its share in export market is constrained, at least with poor quality and insufficient supply of the raw stocks relative to the available raw materials.

In Ethiopia, the supply of raw hides & skins is totally from domestic source. The fact that the production of the raw stock entirely relies on the demand for meat makes the rate of expansion of the leather sector dependent on the growth rate of the economy. Given the low level of income of the majority of the population, the effective demand for meat is very low. Thus the supply of the raw materials, if left to the domestic market for meat, would increase at the rate of growth of the domestic demand for meat, which in turn relies on the economic growth of the country.

Nearly all hides & skins are collected from households via small traders with no appropriate and sufficient amenities. This way of handling in addition to natural damages and lack of premium price for higher qualities cause all kinds of defects. Rejects due to improper flaying, salting and drying have been seriously increasing. As a result, the tanning industry is operating at much below full capacity inevitably face a relatively high unit cost of production and there by adversely affecting its competitiveness in the world market.

The existing technology utilized in tanning industry limits the product diversification only to the stages of semi-processing (i.e., pickled and wet-blue) implying losses from higher value added in finished leather production. This reduces the exports' competitiveness in the international market and productivity (in terms of value added) and produces increasing domestic unfulfilled demand for finished leather in manufacturing sector for local consumption.

This study attempted to investigate the relationship between the explanatory variables considered in the present model and the export supply of leather goods of the country. A time series econometric approach has been applied for estimating the contribution of these variables in export supply response of the leather sector. Consequently two supply equations (long run and short run–error correction) are obtained using log-linear models.

The long run supply estimation confirms that change in world unit price and real exchange rate have relatively substantial influence on exports of leather sector. That is the supply of the export sector positively responds to the change in world unit value and/or real exchange rate. This implies an appropriate level of real exchange rate could support production and generate export surpluses. However, export growth would inevitably require increase supply of production inputs and investable resources. The rest variables (i.e., real GDP, domestic consumption and world supply) are found to have insignificance contribution to affect the supply response of the export sector.

The short run export supply responds reasonably insignificant to foreign price realization from sales in the international market. This result fits the conventional wisdom in the sense

that the export supply elasticity with respect to price suggests some important aspect of the behaviors of the leather sector of the country. The responsiveness to price stimuli could be less important in the presence of high domestic demand which draws the products away from export market.

Owing to the long term nature of the contribution of the real exchange rate to a positive change in the supply of leather export sector, the short run dynamic model found this variable insignificant to influence the growth of the sector. The local currency had been appreciated, in real term, against foreign currency of major trading partners especially during the command economic period and hence the real exchange rate is insignificant to stimulate the supply of leather goods exports although its sign is as per expected.

One of the most influential determinants of export supply is domestic consumption relative to production. The short run analysis entails the significance of this variable in affecting the availability of the exportable for the world market so that a positive change in local absorption tends to reduce the supply of the exports sector under consideration. The elasticity of supply of the exports with respect to domestic consumption is statistically significant, which is perhaps inevitable in countries like Ethiopia where imports of similar products are exogenously constrained and domestic excess demand is in part directed towards the exports. However, as noted by Ajit (1992) in the absence of any restriction on external trade, an increase in domestic demand relative to output would either spill over into imports or decrease the availability of exports for the world market or both.

The two major factors behind this variable may be growths in domestic leather production and population size. The poor production performance in the context of rising local consumers could lead to a rising share of domestic consumption and a corresponding decline in export surplus. As the tanning firms are mainly engaged in the production of semi-processed of the raw hides & skins for export, it has produced domestic unfulfilled demand for finished leather in manufacturing leather goods industry for local consumption. In addition, the tariff rate imposed on imported similar products raises the costs of production of finished leather to domestic producers and the prices of finished leather goods to the local users. This perhaps creates an increasing domestic demand, which put retarding pressure on export of various leather products.

The coefficient of world supply variable is statistically different from zero to explain the variation in supply of the exports. The importance of this variable could be interpreted as that the leather sector has lost its international market share resulting from declining productivity and competitiveness in terms of quality status, value added and prices of the exports. Lack of competitiveness in higher value added might have contributed the local tanning industry to fix its activity to traditional level of processing. However, a higher stage of processing is associated with higher value added per unit cost. This implies that productivity of the local tanning firms, whose output is mainly limited to semi-processing, is likely to be lower than firms in other countries producing finished leather and leather products.

In contrast, the real GDP (representing domestic production capacity) variable, deemed to support for positive supply response of the export sector, is found insignificant both in the long and short run models. The poor infrastructure, marketing, expansion of slaughterhouse &

sheds, preservation, storage facilities are the major factors contributing for low level of productivity of the local leather industry and less competitive in the international market. These are the reflection of the general economic development of the country. However the insignificance impact of this variable most likely arises due to poor quality of data management. There are various reasons for observed discrepancy between actual and reported export supplies. The most serious sources include smuggling of goods to evade taxes and exchange control or exporters over-invoicing, though rarely, in order to acquire government subsidies or other attractive forms of export incentives.

The insignificance of dummy variable ( $D_1$ ), representing policy difference, may be due to that the time period is too short to observe the impact of policy liberalization although it has been underway for the last decade. The policy reform by itself may not generate immediate positive response in export supply of the sector but it further requires the application of better technology, trained skilled manpower, improved factor supplies, active participation of private sector, etc as the international market works under highly competitive environment.

According to the empirical results, the following recommendations could be addressed to improve the overall performance of the export sector and thereby maximize the export earnings.

- Increasing the rates of recovery of the raw materials could raise output capacity of the tanning industry. As operating at full capacity is the major factor for lowering unit cost, sufficient supply of the raw materials to local leather industry could be one way of achieving export competitiveness and there by increase the sectors' share in the

international market. In addition, increasing the supply of the raw stocks to local tanning industry could have significant contribution in reducing the effect of domestic demand pressure on the growth of the export sector. This inevitably require strengthening the expansion of marketing facilities including marketing center, stock route, transport, slaughterhouse, preservation shades and storage in the rural areas and marketing information services along with appropriate price incentive mechanisms based on quality grades. To this effect, the recent established Livestock Marketing Authority (LMA) is expected to undertake the task.

- The insignificance of price stimuli is associated with poor quality standard of the exports. This requires the provision of quality improvement extension service supported by enforceable regulatory measures at least to the most potential regions of the country. The integration among activities of slaughterhouse, meat processing plants, abattoirs and tanneries would also be one way of ensuring quality supply of raw hides & skins.
  
- The prevention and ultimate control of wide spread of various types of animals' diseases could be achieved through the provision of veterinary services along with adequate feeds. The government can hardly provide veterinary services alone as the livestock population is dispersed throughout the country. The involvement of private sector with government license and simultaneous extended full support to provide the service is a move that could make a difference.
  
- Increasing productivity (or value added) needs the leather sector to be transformed to a full-fledged manufacturing stage, with integrated leather & leather product industry. This

perhaps yields the leather sector to be competitive and penetrate the world market and ultimately increase its market share. This calls for some form of measures (such as credit provision, priority in foreign exchange allocation, export promotion, marketing facility) to the type or quality of products (e.g. finished leather and products) may be essential to achieve improved productivity; leading even to a higher degree of competitiveness.

- The technology employed is also one among the factors that make a difference in productivity and competitiveness in the international market. The use of advanced technology significantly improve the level of processing in terms of value added and quality standard of leather and leather products and their efficient production. Hence, the choices of appropriate technology require the effort of concerned public bodies such as leather & leather product technology development institution (LLPTDI).

In addition, export promotion services including market information, contact making, participation in foreign trade fair, trade mission abroad and advertisements in foreign media have to be strengthened through Ethiopian Export Promotion Agency (EEPA).

For the country to exploit the resource endowment, it calls for the government and the business community to take a set of coordinated actions that could improve the efficiency of the sector. If these and related measures are not simultaneously addressed, the desire to positive supply response and increase foreign earning may not be sustained.

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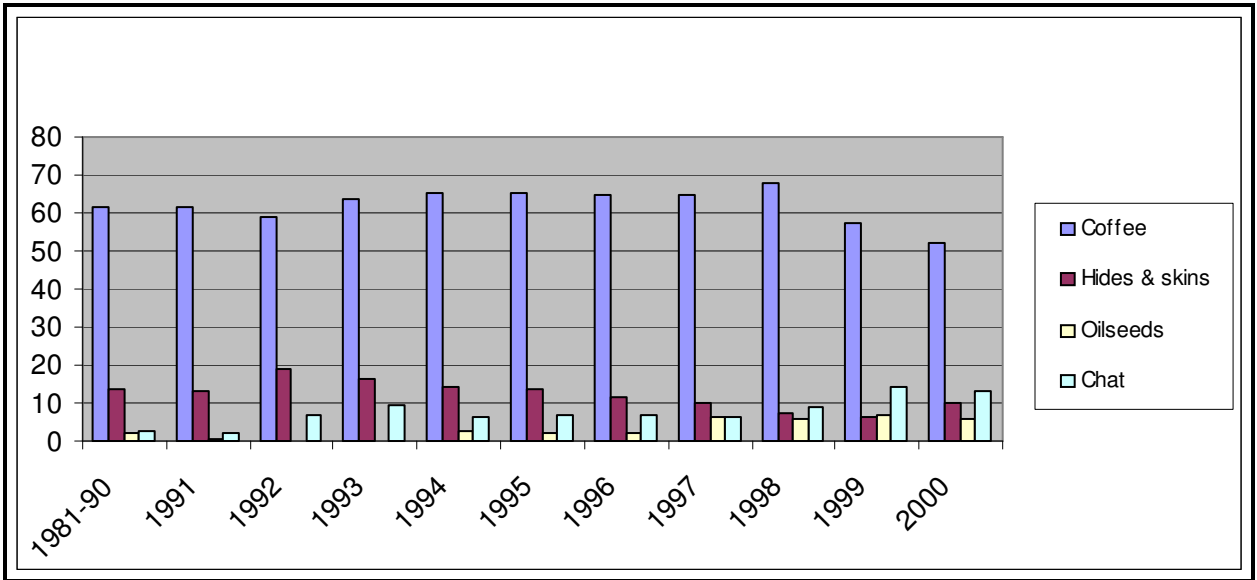
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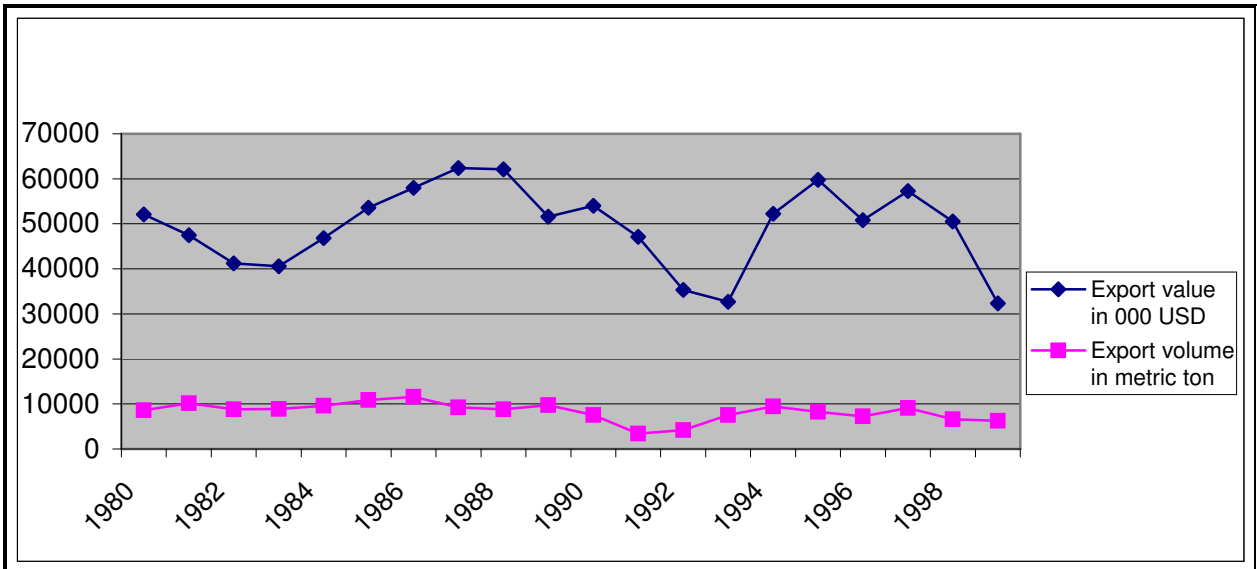
## Appendix A

Composition of major exports earnings



## Appendix B

Trend in leather export volume and value earning



## Appendix C

### Tests of Granger Causality

Autoregressive-distributed lag model of  $\text{LnP}_x$  on  $\text{LnX}_t$

Auto regression part has lags 1 to 1

Distributed Lag part has lags 0 to 1

The present sample is: 2 to 35

#### Auto regression

	Lag 1
Coeff.	0.9503
Std.Err	0.0742

#### Distributed Lag

	Constant	Lag 0	Lag 1
Coeff.	-2.171	0.1319	0.1190
Std.Err	2.003	0.2007	0.1874

$\text{RSS} = 1.92$     $\sigma = 0.25$     $R^2 = 0.889$

$F(3,30) = 80.410$  [0.0000] \*\*

Granger-Causality test for adding  $\text{LnX}_t$  to  $\text{LnP}_x$ :

$F(2,30) = 0.69485$  [0.507]

Autoregressive-distributed lag model of  $\text{LnE}_t$  on  $\text{LnX}_t$

Autoregression part has lags 1 to 1

Distributed Lag part has lags 0 to 1

The present sample is: 2 to 35

#### Auto regression

	Lag 1
Coeff.	0.8926
Std.Err	0.0960

#### Distributed Lag

	Constant	Lag 0	Lag 1
Coeff.	0.1397	0.0113	-0.0161
Std.Err	0.7316	0.0869	0.0868

$\text{RSS} = 0.43$     $\sigma = 0.12$     $R^2 = 0.755$

$F(3,30) = 30.899$  [0.0000] \*\*

Granger-Causality test for adding  $\text{LnX}_t$  to  $\text{LnE}_t$ :

$F(2,30) = 0.018$  [0.982]

## Appendix D

Alternative regressions for short run (error correction) model.  
Dependent variable is in first difference.

Variables	Model I	Model II	Model III	Model IV
Cons.	-0.03 (-0.39)	0.03 (-0.43)	—	-0.07 (-0.82)
LnP <sub>x</sub>	0.14 (-0.89)	0.11 (-0.77)	0.13 (-0.84)	—
LnE	—	0.43 (-1.19)	0.36 (-1.06)	0.484 (-1.32)
LnY	0.73 (-0.872)	—	0.52 (-0.71)	0.76 (-0.93)
LnX <sub>d</sub>	-0.75 (-2.73)	-0.85 (-3.10)	-0.82 (-3.00)	0.83 (-3.03)
LnX <sub>w</sub>	-1.65 (-2.21)	-1.84 (-0.25)	-1.84 (-2.47)	-1.80 (-2.41)
D <sub>1</sub>	-0.008 (-0.09)	-0.02 (-0.19)	-0.02 (-0.37)	0.051 (-0.48)
D <sub>2</sub>	0.11 (-1.32)	0.128 (-1.54)	0.11 (-1.38)	0.126 (-1.52)
E <sub>t-1</sub>	-0.88 (-3.66)	-0.89 (-3.76)	-0.88 (-3.82)	-0.88 (-3.81)
R <sup>2</sup>	47.4	48.6	49.3	49.2
σ	0.22	0.22	0.22	0.22
DW	2.24	2.33	2.28	2.24
RSS	1.29	1.26	1.25	1.25
AR(1)	2.86 (0.042)*	4.65 (0.019)*	4.13 (0.029)*	2.87 (-0.076)*
ARCH	0.185 (-0.376)	0.003 (-0.954)	0.045 (-0.834)	0.142 (-0.709)
Normality	2.61 (-0.271)	1.81 (-0.404)	0.95 (-0.622)	0.06 (-0.972)
X <sub>i</sub> <sup>2</sup>	0.58 (-0.822)	0.56 (-0.839)	0.48 (-0.904)	0.72 (-0.714)
RESET	0.82 (-0.373)	0.70 (-0.411)	0.29 (-0.598)	0.99 (-0.328)
Total obs	34	34	34	34

Δ= first difference, numbers in parenthesis are t-values

\* residual autocorrelation

## Appendix E

Raw data of the study

Years	Export	Export	Export unit	Real	Real	Domestic	World
1966	11034		0.85	3.1852	6194.8	0.333	0.239
1967	11399		0.76	2.8420	6451.8	0.335	0.246
1968	11777		0.91	2.6736	6693.7	0.348	0.252
1969	11790		1.10	2.6573	6963.4	0.388	0.259
1970	10646		0.91	2.6272	7216.2	0.371	0.266
1971	10859		0.98	2.7490	7514.7	0.392	0.273
1972	16303		1.26	2.6905	7855.5	0.291	0.322
1973	13984		2.33	2.5635	8053.2	0.290	0.315
1974	9773		2.31	2.6071	8164.8	0.295	0.329
1975	6835		2.28	2.6596	8163.8	0.325	0.332
1976	9219		2.83	2.8174	8305.9	0.341	0.385
1977	11333		2.05	2.9422	8394.2	0.530	0.374
1978	8226		3.15	2.5833	8252.9	0.541	0.384
1979	12757		5.35	2.2532	8800.0	0.566	0.386
1980	8589		6.06	2.0494	9248.6	0.593	0.351
1981	10167		4.60	2.0498	9324.5	0.580	0.381
1982	8827		4.67	2.07	9374.0	0.560	0.392
1983	8881		4.57	2.2154	10326.5	0.651	0.398
1984	9565		4.81	2.1056	9675.8	0.546	0.449
1985	10884		4.92	2.0536	8734.7	0.561	0.405
1986	11576		5.01	2.1088	9597.3	0.515	0.413
1987	9274		6.73	1.7709	10948.7	0.478	0.377
1988	8829		7.03	1.6480	10947.8	0.425	0.382
1989	9768		5.28	1.8659	10986.4	0.429	0.392
1990	7567		7.13	1.8982	11432.7	0.419	0.427
1991	3422		7.30	1.8189	10938.1	0.545	0.408
1992	4216		8.37	1.7917	10534.6	0.593	0.413
1993	7555		4.33	1.4807	11798.7	0.423	0.439
1994	9485		5.50	1.6702	11999.3	0.368	0.435
1995	8246		7.25	2.7508	12644.3	0.319	0.429
1996	7262		7.00	3.0075	13987.1	0.381	0.427
1997	9072		6.31	3.0973	14709.9	0.384	0.422
1998	6643		7.60	3.3556	14631	0.406	0.449
1999	6232		5.19	3.5967	15553	0.561	0.430
2000	12931		6.09	3.5911	16301.8	0.544	0.469

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