ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF EXPORT PERFORMANCE AND EMPLOYMNET OF LABOR IN LARGE AND MEDIUM SCALE MANUFACTURING INDUSTRY OF ETHIOPIA

AN ARDL COINTEGRATION APPROACH

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November, 2015
Addis Ababa, Ethiopia

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A Thesis Submitted to
The Department of Economics

Presented in Partial Fulfillment of the Requirements for the Degree of Masters of

Science in Economics (International Trade and Finance)

Addis Ababa
November, 2015

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Andualem Girma, entitled: *Determinants of export performance and employment of labor in large and medium scale manufacturing industry of Ethiopia* and submitted in partial fulfillment of the requirements for the degree of Master of Science (International trade and finance) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

The objective of this study is to investigate the determinants of export performance and employment of labor in large and medium scale manufacturing industry of Ethiopia using a time series data from 1978/79 to 2012/13. In this study, effort has been made to identify the long run and short run determinants of export performance and labor employment in large and medium scale manufacturing industry of Ethiopia using an ARDL bounds testing approach and ECM to capture both long run and short run relationships. The estimated results for the determinants of export performance revealed that the market size of the home economy, Europe and domestic infrastructure are positive and statistically significant determinants of export, while the market size of Africa (excluding Ethiopia) and real effective exchange rates (REER) have a negative impact on export of large and medium scale manufacturing industry of Ethiopia. But the market size of the United States of America and the Far East are found statistically insignificant. However, in the short run, the market size of the United States of America found statistically significant which goes with the African Growth opportunity act though the market size of Far East still insignificant. The market size of the home economy and domestic infrastructure are positively significant not only in the long run, but also in the short run and the market size of Africa and REER are also statistically insignificant in the short run. The speed of adjustment has the value 0.7959 with a negative sign, which showed the convergence of the export model towards its long run equilibrium.

As for the, determinants of labor employment, the result shows that the skills of employee's, export and real lending interest rate are both statistically significant in the short and long run, while the real wage rate has a significant effect only in the short run. Furthermore, both the value added per person engaged, a measure of labor productivity, and efficiency are statistically insignificant both in the long run and short run. The speed of adjustment in the employment model is 0.4554. Finally, the major policy implication of this study is, prioritizing investments to words capital goods and enhancing skill capacity of workers through short and long term trainings by the manufacturers for the employee and empowers the managers.

Acknowledgment

Above all, I am thankful to the almighty God for his love, strength, mercies and guidance to accomplish the study well. Secondly, I would like to express my heartfelt gratitude to my advisor Dr. Tadele Ferede for his guidance, suggestions, friendly treatment and constrictive comments from the beginning to this end and inspiration for further studies.

I would like to extend my great appreciations to Hilina Bitew, Habtamu Kefelgn, Takele Getahun and Addisu Mera that have been with me throughout the whole work and their finical support. To all my beloved sisters, brothers and parents also deserve a word of thanks for their contributions and all rounded support throughout my life. Finally, I would like to say thank you the Department of Economics of the Addis Ababa University and all my friends, colleagues, and classmates for their encouragements and moral.

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Acronyms

ADF: Augmented Dickey-Fuller

ADLI: Agricultural Development Led Industrialization

AFDB: African Development Bank

AGOA: Africa Growth and Opportunity Act

AIC: Akakie Information Criteria

ARDL: Autoregressive Distributed Lag

BOP: Balance of Payment

COMESA: Common Market for Eastern & Southern Africa

CSA: Central Statistics Agency

ECM: Error Correction Model

EEA: Ethiopian Economics Association

EPRDF: Ethiopian People's Revolutionary Democratic Front

FDI: Foreign Direct Investment

FTA: Free Trade Agreement

GDP: Gross Domestic Product

GMM: Generalized Methods of Moments

GTP: Growth and Transformation Plan

LDC: Least Developed Countries

LMSMI: large and Medium Scale Manufacturing Industry

MDG: Millennium Development Goals

MOFED: Ministry of Finance and Economic Development

MOI: Ministry of Industry

MVA: Manufacturing Value Added

NBE: National Bank of Ethiopia

NIC: Newly Industrialized Country

OAU: Organization of African Union

OLS: Ordinary Least Square

PASDEP: Plan for Accelerated and Sustained Development to End Poverty

PP: Phillips-Perron

RD: Research and Development

SAP: Structural Adjustment Program

SDPRP: Sustainable Development and Poverty Reduction Program

TGE: Transitional Government of Ethiopia

UNIDO: United Nation Industrial Development Organization

VAR: Vector Autoregressive

WB: World Bank

WTO: World Trade Organization

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The historical experiences of the world economy shows that countries used different types of polices and strategies taking into account their own resources and contexts , but all have the ultimate objective which is the attainment of the industrial development. And, this industrial development requires structural transformation from agriculture to a more productive and complex economic activity such as industry. This implies industrial development matters for sustainable economic development. Because, it provides high wage jobs, a key to trade deficit reduction, commercial innovation and environmental sustainability. (Susan, Timothy and Howard, 2012).

More specifically, there seem to be at least three ways in which industry helps to achieve the goals of economic and social development. In first place, industry's substantial contribution to economic growth helps to create a large portion of the resources needed to fund social development programs. Second, creation of employment and hence generation of income take place in the industrial sector directly and are indirectly fostered other sectors - like agriculture or services –through linkages effects. And finally, industry promotes various aspects of social integration through its general thrust towards modernization and makes a specific contribution to the national economic integration. (Urgaia, 2007).

From the above, four features can be descended. First, industrialization is not a one time or sudden occurrence but rather a sustained process. Second, industrialization requires the application of modern science and technology to the production process. Third, the manufacturing sector plays the most important in the industrialization process, that is, the key and dynamic role in this process is played by manufacturing sector. Last but not least, industrialization brings about structural transformation of the national economy. As a result, this makes manufacturing sector as dynamic component of the industrial sector.

In general, industrialization has a significant role in the economic development particularly in fostering of export performance and reduction of unemployment. And, the essential roles played by industrial sector are based on five arguments. First, development arguments: more advanced nations are better industrialized and less developed nations are less industrialized. Second,

Employment argument; the industrial sector has more potential to create job opportunities for rapidly growing urban population of developing nations than any other sector.

Third, the BOP (Balance of payment) arguments; a developed industrial sector, in general, generates more foreign currency compared to the agricultural sector. That is, industrialization will helps to alleviate the BOP problems. Fourth, the linkage argument; if the industrial development directed to use local raw materials, it can create strong linkages among different sectors of the economy. This is due to the dynamic nature of the industrial sector which entails externalities in consuming agricultural raw materials, producing consumer and capital good for the economy. Finally, saving argument; the profit margins in the industrial sector are higher than those in agriculture and this may lead to a higher level of saving.

Identifying the export performance and employment of labor in industrial sector in particular large and medium scale manufacturing industry has always been an eye-catching issue for developing countries like Ethiopia since Ethiopian government paid great attention to FDI (Foreign Direct Investment) in order to inspire its development.

The Ethiopian governments at different time have introduced industrial policies and strategies to revitalize the industrial sector. During the imperial era, the effort was on import substitutions though industrialization by encouraging the private sectors. However, the performance of manufacturing activity and employment creation was too low compared to the other developing nations. Following the imperial regime, the Derg regime took the power with radical change in the structure and management of the industrial sectors such nationalizing of the all large and medium scale manufacturing industry, licenses restrictions, capital ceiling etc. Like the previous regime the overall performance of the manufacturing sector was disappointing.

After the overthrow the socialist government, the EPRDF (Ethiopian People's Revolutionary Democratic Front) came to power with a policy which considered as cautious capitalism. With respect to the industrial sector the TGE (Transitional government of Ethiopia) accepted different polices such as SAP (Structural Adjustment Programme) and implement ADLI (Agricultural Development led Industrialization) that aimed at making the agricultural sector as a spring board to bring industrial development. So far, the result was similar to the previous governments at overall level but there are some encouraging results such as active involvements of private

sectors and industrial production in large and medium scale manufacturing industry.

Transformation towards industrialization entails increased share of employment, value added, export earnings, etc of the manufacturing sector in the Ethiopian economy. Manufacturing export receipts increased from US 92 million dollars in 2009/10 to US 386.30 million dollars in 2011/12 growing by more than three fold in three years. This, however, is less than the target set in GTP-I. Of the industry's sales, the share of export increased from 3% in 2009/10 to 6% in 2011/12 indicating increased export orientation of the sector. The growth of employment rate during the end period of SDPRP (Sustainable Development and Poverty Reduction Plan) was 3.58 percent on average, 11.40 percent during the PASDEP (Plan for Accelerated and Sustained Development to End Poverty) and -0.67 percent during the first two year average of GTP-I period due to dramatic decline employment share in food and beverage industry. These finding are so fare unsatisfactory in the face of growing population and graduates from the university. (EEA report, 2014)

In terms of approved investment capital, manufacturing constitutes the largest share (31.6 percent), followed by electricity, gas, steam & water supply (24.7 percent), real estate, renting & business activities (18.5 percent), agriculture, hunting & forestry (10.9 percent), construction (4.9 percent) and hotel & restaurants (4.7 percent).(Annual report of NBE,2012/13).This indicates that the government gives top priority to the manufacturing sector to be industrially prosperous where its peoples become free of poverty and backwardness and attain middle level income status by 2025.

1.2 Statement of the Problem

Industrialization is an integral to economic development. Rapidly growing economies tend to a have rapidly growing manufacturing sectors. Manufacturing sector has a lion share in generating huge foreign exchange, employment and economic development at large. (UNIDO, 2009). Successful countries have always pushed the limits of their comparative advantage and diversified their economies into new activities with high value addition such as manufacturing. (World economic forum, 2012).This shows that the capacity of manufacturing sector to produce and supply capital, intermediate and consumption goods demanded by all other sectors of the economy.

Industrialization, focusing on manufacturing has become a major focus of African countries

including Ethiopia. In 2008, a special session of the continental political grouping, the OAU (Organization of African Union) was devoted to the issue of industrialization by African countries. Furthermore, low growth of manufacturing exports has been identified as a major factor for poor economic performance in many Sub-Saharan African economies (Amakom, 2012). The renewed focus on manufacturing in Africa is the result of the persistent weakness of African economies characterized mainly by production of and export of raw materials and large balance of trade deficit in many African countries including Ethiopia. And, what is more surprising is that even the demand for primary commodities going down due to different factors like political instability and transportation costs. For Ethiopia, the service sector continues to be the main engine of growth of the economy, average annual growth was 13precent for the period between 2003/04 and 2009/10 and it contributes 42.3% to the Real GDP (MOFED, 2011).

Despite the strong policy emphasis on agriculture, its contribution to overall growth has not been commensurate with its share in GDP. The contribution of the manufacturing sector to growth, employment and exports has remained minimal. In addition, reflecting declining sectoral terms of trade, the manufacturing sector share of GDP (in current prices) has shrunk, contribution to the GDP growth decline from 14% in 2003/04 to 13.3% in 2009/10 (AFDB,2014).Not only did the share of manufacturing real value added in total industrial GDP decline, Ethiopia's manufacturing sector is also lagging in comparison to peer economies and relative to its aspirations: both manufacturing value added (MVA) share in GDP and MVA per capita in Ethiopia are well below the Eastern Africa regional average and selected Asian countries.

Manufacturing exports not only represent a relatively low percentage of total merchandise exports, but also the share has shown a declining trend in recent years (from 19.05% between 1990/91 and 1994/95 to 9.84% between 2010/11 and 2012/13). Furthermore, Ethiopia exports very few manufactured commodities compared with the Eastern African average and selected Asian countries, indicating both a low manufacturing production base and a lack of competitiveness of the sector. The same is true where the share of employment in each sector of large and medium scale remain more or less stagnant over a long period. (African Development Bank, 2014)

In short, the Ethiopian economy is one of the least industrialized and its manufacturing sector is least developed in terms of volume and quality products, technology status, labor skills and export capabilities. Primarily, this is because manufacturing is not only the least developed but

also structurally distorted. Thus, the manufacturing sector has backward linkage with other sectors. Even, the contribution of manufacturing sector to labor employment and export remains weak. In turn, this problem forced us to raise questions like would a continuation of the historically high growth performance be sufficient to reach lower-middle income country by vision 2025 with this poor performing manufacturing sector? Does Ethiopia need more of the same type of growth or is a change in the source of growth warranted without manufacturing progress?

Therefore, to maintain the current promising economic growth in sustainable manner or observe options for other sources of growth, it's very indispensable to investigate export performance and employment of labor in manufacturing sector in general and large and medium manufacturing sector in particular. Up to now, there have been few empirical studies conducted on export performance and employment of labor in large and medium scale manufacturing industry. (Urgaia 2007; Abenzer, 2012; AFDB, 2014).

However, the existing studies lack in at least the following two aspects. First, these studies didn't address the effect of manufacturing sector on export performance and employment determinants of large and medium scale manufacturing industry sector and most of them were focused at firm level not at country level. Secondly, the studies foundation was based on the descriptive assessment without applying any econometrics model .But, it's very crucial to identify the intensity by which the variables included under the study affecting the manufacturing sector. All these issues will be addressed in this paper, which assesses quantitatively the export performance and employment determinants of large and medium scale manufacturing in Ethiopia.

1.3 Objectives of the Study

The overall objective of the study is to identify the determinants of export performance and employment of labor in large and medium scale manufacturing industry of Ethiopia. The specific objectives include;

- To assess the policy environment and trends of export and employment in large and medium scale manufacturing industry of Ethiopia
- To analyze the effect of export on labor employment in large and medium scale manufacturing industry of Ethiopia, and

- To recommend some possible policy measures based on the findings

1.4 Significance of the Study

In our globe, one country's economic activities are intimately linked with the economic activities of other; this is what we call global interdependence. These relation form a complex flow of goods and services, capital, labor and technology and these forms have their own merits and demerits. Hence, each and every economic decision to be made by a country should be subjected to watchful understanding of the global economic situations and carful realization of its relationship with the domestic economic grounds.

Among different economic variables that need a careful attention by a given nation and the policy makers is that which sector should led the country's economy to have a sustainable economic development. Accordingly, most countries guide their economic activities whether it's in path of achieving industrial development or not because growth of an industrial economy can have much greater consequences for development. Moreover, rapid growth has been associated with diversification where manufacturing sector contribute to GDP and employment. In this regard, policy options that can have even small effects in the long-run; export performance and employment in manufacturing sector are some of the contributors to accelerate development.

Furthermore, since there is no study conducted so far on the separate determinants of export performance and employment of labor in large and medium scale manufacturing sector of Ethiopia this study, besides being a partial fulfillment of master's degree, will give an indispensable guideline for industrial policy and in particular for GTP-II . In addition to this, it could also be used to other interested researchers for the reference.

1.5 Scope of the Study

While the literature on the industrial sector is vast and controversial, this study is limited in addressing of the determinants of export and employment of labor in large and medium manufacturing scale for the period of 1978/79 to 2012/13 based on the availability of data.

1.6 Organization of the Study

The remaining part of the study is organized as follows. Chapter two presents the theoretical and empirical literature followed by an overview of Ethiopian economy that particularly focused on large and medium scale manufacturing sectors. The fourth chapter presents the specification and discussion of the model. Model estimation and discussion of the results would be presented in chapter five. The last chapter would provide conclusions and policy implications drawn from the findings of the study.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Review of Theoretical literature

2.1.1 Trade Paradigms

Various theories by different school of thoughts have been advanced to provide a theoretical foundation for the empirical analysis of arguments of trade. The primary school of thought that dominated political and economic thought of the world during 17th and 18th century was the mercantilism doctrine that based on the premise that a country can promote its self-interest by discouraging imports and encourage exports in order to increase its wealth through holdings of precious metals . The mercantilist believed that exports helps in flow of foreigners' payments for domestic goods while import resulted in outflows of goods and services, domestic residents payments to foreigners for their goods. This situation implied international trade was a zero sum game meaning exports were ''good'' while imports were ''not good at all''. In order to encourage exports and make them competitive in the international market they advocated for reduction in taxes, low wages and interest rates of a country (Keith P, 1998).

However, in the late 18th century another school of thought came to refute the mercantilists view international trade and to demonstrate that trade between countries was beneficial to both countries. This mutual benefit of trade explained by the pioneer economist Adam Smith based on the absolute advantage model and arguing that the wealth of a nation would be increased through increasing productive capacity in an environment where people are free to pursue self-interest. A nation has absolute advantage over the other if it uses lesser amount of factors of production to produce one unit of a commodity than the other country.

Smith applied his ideas to specialization and exchange between countries and demonstrated that countries could gain by trading if they have differences in absolute advantage. Smith's explanations of mutually beneficial trade were an effective rebuttal to mercantilism and showed convincingly how countries could gain from trade. But, Smith's analysis leaves an answered question. Why would trade occur between two countries if one had as an absolute advantage in the production of both goods? This question answered and developed by another classical British economist David Ricardo. Ricardo formulated the theory of comparative advantage which states a country ability to produce a good at lower (opportunity) cost than another country. In other words, the theory of comparative advantage suggests that a country

should specialize in the production and exports of those goods in which either its comparative advantage is greater or its comparative disadvantages is less; and it should import those goods in the productions of which its comparative advantages is less or comparative disadvantage is greater. Thereby, a country would be able to maximize its production (GDP) and its consumptions (economic welfare).

Ricardo illustrated the principle of comparative advantage with the following examples:

> *"Two men can make shoes and hats, and one is superior to the other in both employments; but in making hats he can only exceeds his competitor by one-fifth ,or 20 percent , and in making shoes he can excel him by one-third or 33.3 percent. Will it not be for the interest of both that the superior man should employ himself exclusively in making shoes, and the inferior man in making hats?"*
>
> David Ricardo, 1817

Regardless of the universal validity of the comparative advantages, there remains one snag viz. The validity of the classical analysis and conclusions depends on the assumptions of the labor theory of value. The labor theory of value[1]is not generally accepted as valid at least for two reasons: labor is not homogenous factor and labor is not the only factor of production goods rather produced by using some combinations land, labor capital and entrepreneurship not solely labor. It's therefore necessary to free the comparative advantage theory from the restrictive classical assumptions of the labor theory of value.

The school that answered and analyzed the impact of the international trade in more rigorous and less restrictive manner appeared in the late 19th and early 20th century called neoclassical economy theory, more importantly the Heckscher and Ohlin take the lion share. The H-O model further explain the classical economists in such a way that the base for trade as factor endowment and factor intensity. Meaning, the H-O model postulates that a labor abundant (or capital-scarce) country will have a comparative advantages in the production and export of labor intensive goods, while a capital abundant (or labor scarce)country will have comparative advantages in the production and export of capital intensive goods. Thus, through trade, a labor abundant country will export labor intensives goods (because labor is cheap or wages are low) and import capital intensive goods, while a capital abundant country will export capital intensive goods (because capital is cheap or rental costs are low and import labor intensive goods). Specifically ,the theory argues that relative price levels differ among nations since they have different relative

endowments of factors ,i.e. supplies of factor productions and that different commodities require different intensities (degree of factor use) of factor inputs in their production.

However, there were few empirical tests that found against the H-O theory of comparative advantages namely factor intensity reversal arguments, demand reversal and Leontief paradox. Wassily Leontie applied input-output technique to examine the structure of US foreign trade .He examined the factor of composition of US exports and imports. Leontie considered that US is capital abundant and thus should export capital intensive products and surprisingly he found US exports were labor intensive , and US import substitutes were capital intensives. Leontie justified his results such that US exports were highly skilled or possess human capital (knowledge and skills) compared to other countries. Therefore, what needs to be considered is what constitutes a factor of production? The knowledge and skills that the labor force (human capital) possesses should be treated as a separate factor of production.

Finally, the new trade theories tried to answer basic questions that were not covered under the H-O model such as countries can trade similar goods with one another through product differentiation or intra-industry trade, even if two nations are identical in every aspects of commodities production, mutual beneficial trade can take place by increasing returns to scale (Economies of scale). Another new trade theory, the product model cycle explained that certain countries, primarily industrialized countries, specialize in the production of new goods based on technological innovations, while other countries, mostly developing countries, specialize in the production of the already well-established goods. Furthermore, the model postulates that the introduction of new products usually requires highly skilled labor in the production process.

As the product matures and acquires mass acceptance, its production becomes standardized, requiring less skilled labor. In this process, the comparative advantages shifts from the advanced nation that originally introduced the product to the less advanced nation with relatively cheaper labor. This may be accompanied by foreign direct investment from the innovating nation to the nation of cheaper labor (Krugman and Obstfeld, 2009).

2.1.2 Nature of Employment: The relevant Economic Theory

Several economic theories are used in conjunction as the underlying bases for this study. The relevant theories include the human capital theories, classical model, the Keynesian model, and Marginal productivity theory. According to the human capital theory, human capital contributes

to output just like other factors of production and also through technological change by driving both innovation and imitation (Luvanda et al, 2010). Based on Corvers (1997) there are four effects of human capital on labor productivity: 'Owen productivity effect', 'allocative effect', 'diffusion effect' and the 'research effect'.

The worker effect or own productivity effects: this effect has been explained by Welch (1970). He assumes that firms produce only one good with the production factor education, and that other resources are given. The worker effect refers to the positive marginal productivity of education with respect to that particular good. Workers with a higher level of education are assumed to be more efficient in working with the resources at hand, i.e. these workers produce more physical output. In other words, education increases the effective labor input from the hours worked. Therefore a better educated labor force shifts the production possibility curve outwards.

The allocative effect; Points to the greater (allocative) efficiency of better educated workers in allocating all input factors to the production process (including education itself) between the alternative uses. Welch (1970) gives two examples of the allocative effect. If there is one fixed input factor to produce two goods, education may improve the total revenues of firms by means of a better allocation of the input factor between the alternative outputs. Although the production process is technically efficient because the firm produces on the production possibility curve (expressed in physical units), workers have more knowledge of how to maximize the marginal value product (expressed in money units) of the input factor.

Total revenues are maximized if the marginal value product of the input factor is equalized for all goods. Another allocative effect is present if, in addition to education as an input factor, two (or more) other inputs are included in the production function. If just one good is produced with two inputs, education may also help to select the efficient quantities of inputs. In equilibrium the marginal value product of the inputs should equal the price of the inputs. In fact, education seems to provide the skills to make better decisions based upon the available information. As a result of the allocative effect, an increase in the relative proportions of intermediate and highly-skilled is expected to lead to a higher productivity level in money units.

The diffusion effect; Stresses that better educated workers have more ability to adapt to technological change and will introduce new production techniques more quickly. Nelson and Phelps (1966) stated that "educated people make good innovators, so that education speeds the process of technological diffusion". Moreover, Nelson and Phelps (1966) stress the role of receiving, decoding and understanding information in performing a job. A higher level of education increases the ability to discriminate between more and less profitable innovations and reduces the uncertainty about investment decisions with regard to new processes and products. Therefore, education increases the probability of successful and early adoption of innovations. Higher proportions of intermediate and highly-skilled workers, relative to low skilled workers, would be expected to lead to more rapid and successful adoption of innovations and higher productivity growth.

The research effect; refers to the role of higher education as an important input factor in research and development (R&D) activities. R&D, in turn, is a key factor for technological progress and productivity growth. Since R&D activities are very complex, a relatively large proportion of intermediate and highly-skilled workers are a prerequisite to increase technological knowledge and achieve productivity growth. (Fallahi et al, 2011)

The classical model advocates the importance of wages (factor cost) in determining the equilibrium level of employment. They claim that if there is disequilibrium (deviations from the equilibrium point), the economy will correct itself. That is a reduction in output and employment of the economy would lead to a reduction in prices and this will increase in consumer spending. On the other hand, the reduction in employment will force to lower wages and this will decreases unemployment. The Classical economists argued also that investors would invest all savings. That is desired savings equal desired investment. Desired saving is positively related to the interest rate and is a supply of savings curve. Desired investment is inversely related to the interest rate and is a demand for investment curve. The intersection of both desired savings and investment curves will determine the equilibrium point. On the other hand, in the classical model, wages are determined by the supply and demand of labor. The demand for labor is downward sloping because at higher wages firms will demand fewer workers to work for them. The supply of labor is upward sloping because when wages are higher, more workers are willing

to work. If there is excess supply of labor then wages will fall and those workers who are willing to accept at lower wages will be employed.

But, it is not necessarily true per the efficiency wage model. Lower wage rate may not be accepted by the employers even if there is excess supply of labor because they may fear that the adverse effect on worker productivity out weight the reduction in the wage rate per worker, thus increasing actual total labor cost. As a result, there may be unemployment even in a world populated by perfectly competitive firms. There are at least five different explanations for the link between wages and workers' productivity. First, it has been argued in development literature that there has been a direct relationship between level of nutrition and productivity. Those employees that receive good wage have a potential to get balanced diet and good concentration on jobs and hence it helps to increase employee productivity. The second theory leading efficiency wage effect is based on labor turnover. The lower the wage, the higher the rate of turnover and hence employment affected negatively. To the extent that the firms must incur training costs for the new workers, this mechanism gives rise to a link between the wages and workers' productivity.

Third theory is based on imperfect information on the part of employers about the characteristics of the workers. By paying a high wage employers obtain a high quality labor force. The fourth theory is based on imperfect information that the employers has on the actions of the workers and the cost of monitoring them. Unemployment works as a disciplinary device (Shapiro and Stiglitz, 1984): if workers are caught shrinking on the job, they are fired and being unemployed (for same time). Finally the theory suggests that workers' performance depends on whether they believe they are being treated fairly. In this sociological theory the workers are particularly interested in their wage relative to that of others workers.

Furthermore, the Keynesian model explained that interest rate adjustments cannot be relied on to make saving equal to investment because the interest rate is not the major motivating force in either the saving or the investment decision. In his view the level of income is the primary factor influencing the amount that households plan to save; the higher the income, the greater the level of saving. Changes in interest rates have a relatively minor impact on saving decisions. Investment decisions, said Keynes, are governed by profit expectations. The interest rate is only

one factor influencing the profitability of an investment, and not the most important factor. If sales are poor and the future looks bleak, businesses are unlikely to undertake new investment, even if the prevailing interest rate is low. Since the interest rate is not the major force guiding saving and investment decisions, it cannot "match up" the plans of savers and investors. As a consequence, when households want to save more than businesses desire to invest, the level of output and employment in the economy will tend to fall. In short, increased saving (reduced spending) can lead to unemployment.

The MRP theory emphasizes the concept of "derived demand" which suggests that workers are hired by firms because of the need to produce a commodity demanded by consumers. According to this short run model, output can only be influenced by manipulating the level of labor hired by the firm.

2.1.3 The impact of manufacturing sectors on employment

Lavopa and Szirmai (2012) on the behalf of United Nation working paper distinguished the impact of manufacturing sector in three main categories. First one is the direct impacts on employment, at given levels of labor productivity; growth in manufacturing output creates new jobs in the manufacturing sector. Given the higher productivity of manufacturing (as compared to many other sectors of the economy such as agriculture or the informal sector), these jobs tend to be well-paid and of good quality. Structural shifts in employment from low-productivity sectors (For instance agriculture) to manufacturing will thus have a positive effect on the incomes of the poor.

The evidence reviewed shows that such direct effects are positive when growth of manufacturing is rapid, especially at lower levels of per capita income. However, there are limits to the direct effects of manufacturing on overall employment creation and poverty reduction, because fast productivity growth will slow down the direct creation of employment and because manufacturing only accounts for a modest proportion of the total employed labor force**.** Given this low share it is inevitable that most employment creation will occur in other sectors.

The second impact is an indirect; growth in manufacturing output also creates new jobs in other sectors of the economy, through indirect input-output linkages. Given the strong backward and forward linkages of the manufacturing sector with the rest of the economy, its employment

generation potential is much larger than the jobs directly created. The literature reviewed tends to regard manufacturing as the sector with the strongest linkages and the largest employment multipliers of the economy. The evidence suggests that one job created in manufacturing will create a larger number of jobs in other sectors than one job created in any other part of the economy. The impact on poverty of this indirect effect, however, is less straightforward. It depends on the average wages and labor conditions of the sectors which are strongly linked with manufacturing. In general, however, one should expect a quite strong and positive impact of manufacturing growth on poverty through this channel. More research needs to be done on employment multipliers in developing countries.

Lastly an induced impact of employment, growth in manufacturing output also creates new jobs in other sectors of the economy due to induced effects, both in demand and supply. Induced impacts are external effects of investments in manufacturing, other than the linkage effects discussed in the previous section. From the demand side, the net increases in incomes received by the workers in the jobs directly or indirectly created through investment in manufacturing will be re-spent, generating Keynesian type multiplier effects in the economy that will, in turn, contribute to higher demand, additional employment and –eventually– additional income for the poor. From the supply side, manufacturing is seen as playing a special role as engine of growth of the total economy, especially through knowledge spillover effects. By stimulating growth in this way, manufacturing would have additional impacts on overall employment and poverty alleviation.

2.2 Review of Empirical Literature

2.2.1 The Relationship Between export and manufacturing sector

Empirical studies on the relations between export performance determinants and manufacturing sectors are many using different methodologies, but to date the available empirical literatures can be divided in two major categories: cross-sectional studies and time series studies A brief review of the experiences of some countries is presented below.

Nelson Marconi et al. (2013) used dynamic panel data for a sample of 63 middle and high income countries excluding major exporters of fuel for the period of 1990-2011 and evaluate the role of manufacturing sector in the development process through the first and second low of

kaldor. Their GMM estimation result showed that the manufacturing output growth has significantly positive effect on stimulating the aggregate economy growth and specifically, the effect is very high for middle income countries and this indicates the sector's importance for countries that are at an intermediate stage of development. In addition, the effect of manufacturing sector growth rate on other sectors also greater in the middle income countries, but at a very similar magnitude.

The coefficients of the variable associated with investment are greater in middle-income countries and this variable may play a very important role in intermediate development stages because economies that are not yet mature depend on the expansion of the production capacity and its multiplier effect to grow at significant rates. Investment also stimulates the demand for intermediate inputs and inter-industrial demand itself. Furthermore, the magnitude of manufacturing export effect on economic growth is positively high. The effect is greater for middle-income countries, indicating that manufacturing export sector's role of supplementing and even stimulating growth is greater in countries at intermediate development stages. The relation between the real exchange rate and output growth, in its turn, had a positive coefficient in the first law for middle-income countries, indicating that devalued rates may be associated with greater economic growth. It's smaller influence in high-income countries, which have possibly reached a higher level of competitiveness and became less dependent on this relative price. Middle-income countries appear to have greater need to keep their exchange rates at a competitive level in order to consolidate their industry and sophisticate their productive structure.

A further study conducted by Thirlwall and Pachecho-lopez (2013) to examine the kaldor's first growth law for open developing economy that includes Africa, Latin America and Asia using OLS and 2SLS.The study focused on the link between manufacturing output growth verses export growth and export growth with GDP growth. Their results tells us that for all developing countries excluding oil producing countries, the kaldor's first law is supported: there is strong relation between manufacturing output growth and export growth with an elasticity of 0.91 and a strong relation between the growth of the GDP and export growth with a coefficient of 0.52. The highest impact for the strong relation between manufacturing outputs growth and the GDP growth comes from the strong effect that the manufacturing has on export performance. Disaggregately, for Africa and Asia, the kaldor's law strongly supported where the elasticity of

export growth to manufacturing output growth is dominant and for Latin America, kaldor's first law[1] is also supported, but the relationship between manufacturing output growth and export growth is weak while strong relation between GDP growth and export growth is a dominant factor.

Based on H-O model of theoretical foundation and the traditional production function, Cobb-Douglas, for the period of 1975 to 2010 Onakoya, et al. (2012) examined the impact of trade openness on the manufacturing sector performance in the Nigerian economy. The effects of stochastic shocks of each of the endogenous variable were explained by using ECM. And, there study revealed that trade openness had positive impact on the growth of manufacturing sector though small but significant while exchange rate and inflation rate had negative impact on the sector performance. The error correction coefficient that indicated rate of adjustment for disequilibrium of the variables showed growth in the manufacturing sector adjusted slowly in the economy.

Edwards and Alves (2005) found similar outcomes that determine the South African's export performance of the manufacturing sector. They employed variant imperfect substitution model of Goldstein and Khan (1985) by representing a system of export supply and export demand questions. Their study focused on three major parts with three important results. First they evaluated the extent to which composition and level of manufacturing exports have responded to reform initiatives in the 1990's and found that successes of the South Africa polices in generating export growth have been mixed; the inability to re-structure exports towards dynamic, high-technology products was one explanation for the relatively poor export performance of South African manufacturing during the 1990s. Second, the paper investigated the determinants

[1]*The first states that the higher the growth of industrial output, more significant is the growth rate of the product of the economy as a whole. The second law, known as the Kaldor-Verdoorn law, establishes a deterministic relation between growth of manufacturing productivity and output growth in the manufacturing sector. Additionally, it is tested the influence of manufactured exports in this process, given its importance as a source of autonomous demand and as a factor that relaxes the constraint to growth , and the relevance of the exchange rate, because it is assumed that its level influences exports of such products*

of South African manufacturing export performance using estimated export supply and demand functions; it shows that South African manufacturers are on average price-takers in the international market and that exports are predominantly supply driven. And third, the paper found that export growth is constrained by factors that affect the profitability of exports; real effective exchange rate, infrastructure costs, tariff rates and skilled labor are found to be important determinants of export supply.

The African Development Group (2014) made a diagnostic and intensive analytical assessment on the current status of Ethiopian manufacturing sector using a descriptive type of study. Among their assessment unparalleled growth of the manufacturing export took the lion share and found that manufacturing not only represents a relatively low percentage of total merchandise exports but also the share had shown declining trend in the recent years. And, Ethiopia exports very few manufacturing commodities compared with eastern Africa average and selected Asian countries indicating both a low manufacturing production base and a lack of competitiveness of the sector. For this poor competitiveness in the export markets the group found infrastructures deficiencies, limited access to finance, quality issues, weak market diversifications, weak technological development, and lack of critical mass of sufficient skilled workers and regulatory burdens as major bottlenecks.

Yishak (2009) investigated the export performance of Ethiopia using a panel data for the period 1995 to 2007 and his model estimated by the Generalized Two stages least squares (G2SLS) method. His results suggested that supply side conditions are major factors for Ethiopia's export performance. The results showed that good institutional quality and internal transport infrastructure appear to be major determinants, whereas the real exchange rate and FDI have no statistically significant effect on Ethiopia's export performance. Furthermore, the growth of domestic national income affects Ethiopian exports positively. Foreign market access conditions also play a significant role. The results indicate that import barriers imposed by Ethiopia's trading partners do play an important role in determining the volume of Ethiopian exports. Moreover, export performance is positively related to Ethiopia's trading partners' national income, and distance, which is a proxy for transport costs, affects Ethiopian exports negatively.

Berhanu (2003) examined the prospects for the export diversification in Ethiopia using export instability model and export determination model by error correction model estimation

procedure. His study found that real effective exchange rate and real private sector credit access are positive and significant determinants of the country's exports in the long run. Consistent with his theoretical expectations, real GDP and real private sector credit were found to be positively and significantly related with the country's exports in the short run while negative and significant relationship was reported in the case of real private consumption. Furthermore, Berhanu's study highlighted the existence of promising prospects for export diversification given the conducive working environment created by the lunch of policy measures, the current ADLI strategy and the accompanying export development strategy, the coordinated institutional support, the export specific incentives , E-commerce, the opportunities created by WTO, the COMESA, FTA and the AGOA provisions. He also acknowledged the existence of changes such as increased exposures to international competitions and exposures to the external shocks associated with the globalization and liberalization of the world trade.

Fixed effect model employed by Tofik (2004) to analysis the relative unit labor cost, international competitiveness and export of selected manufacturing industries namely Textile, leather and footwear. His fixed effect model estimation shows unit labor cost effect on the export supply is negatively significant and a 1% decline in relative unit labor cost raised the export supply by 1.25%. This implies that to be internationally competitive in textile, leather and footwear, it requires a decline in relative unit labor cost of these sub sectors. Likewise, the effect of GDP is positively significant and a 1% change in the world demand could raise the export supply by 13%. This implies export supply is highly responsive to a world demand change and shall be taken as a signal for analyzing world demand situations in order to be competitive in the export market. Other variable like rainfall and tariff have insignificant effect on the export supply and implies a reduction in both variables does not result a change in export supply and international competitiveness.

Johansen co-integration and vector error correction approach employed by Belayneh and Wondaferhu (2011) in order to determine the export performance for the period 1970/71 to 2010/11: trends and share of different export items and examined the long run and short run determinants of export performance of Ethiopia. The findings of their study revealed that in the long run export performance has found to be positively influenced by openness, real effective exchange rate, RGDP of home country, infrastructural development and private credit as a ratio of GDP (financial development) while the RGDP of trading partner was found statistically

insignificant. In the short run, only previous year openness has directly involved in enhancing export performance of the current year but the rest of the variables are found to be statistically insignificant.

However, Sisay (2010) using similar methodology in determining export performance of Ethiopia and found terms of trade, REER, foreign income and FDI were insignificant while merchandize export volumes influenced significantly by gross capital formation (proxy for production capacity) and share of trade in GDP (proxy for trade liberalization). His manufacturing export equation revealed that manufacturing export supply was found to be negative and significantly affected by foreign income and like merchandise exports, manufacturing exports were also influenced by gross capital formation positively. Sisay's study covered the period 1981-2004 and during these periods Ethiopia export performance was highly volatile, on average merchandize exports grew at 7% per annum but manufacturing exports grew by 4% per annum. The trends also revealed that Ethiopian exports mainly dominated by few and similar commodities where manufacturing exports account for less than 15% of merchandise exports on average.

Imperfect substitution model employed by Nega (2013) to examine the export performance of Ethiopia for the period of 1974-2011. His long run model estimation revealed that terms of trade, real GDP, and openness are the positive determinants of country's exports while the real effective exchange rate and domestic credit access representing the negative relationship with the country's export performance. For the significant effect of the real exchange rate he justified that enhanced competitiveness through strict quality control as well as through a shift in the structure of both merchandise and manufacturing goods and trade towards products with higher income elasticity of demand (manufacturing products) is a valid option in the long run. In the short run, openness, real GDP and capital expenditure have positively significant effect on the export performance while real exchange rate and domestic credit are negatively significant.

2.2.2 Determinates of Employment in the Manufacturing Sectors

Most of available empirical literatures on the relationship between employment and manufacturing sector are cross sectional studies and few time series studies. Some of the world experiences are reviewed briefly as follows.

Fiouz Fallahi et al. (2011) used OLS estimation technique to investigate the determinants of labor productivity in Iran's manufacturing firm's focusing on labor education and training. The OLS estimation result indicates that the workforce with education associate degree and higher levels positively and significantly affect the labor productivity while trainings provided to employees is negative and significant. The capital intensity resulted a positive effect on the production of firms and among all variables employed amount of wage payments is the most significant variables (labor productivity affected mostly by amount of labor).

However, Onaran and Aydiner-avsar (2006) found the common wisdom about the inverse relationship between wages and employment is not valid. Their estimation result that based on seemingly unrelated regression model showed the wage effect is insignificant in some sectors and in some other sectors the wage effect is significant but positive. Most of the sectors with an insignificant wage effect were using relatively skilled labor, and some of them were capital intensive. The unexpected positive partial effect of wage on employment is interpreted by both as an indicator of demand effect out of wage income. Unlikely to wage, investment had statistically significant and positive joint effect on employment and most sectors used unskilled labor while very few used capital intensive. The only variable which is positively significant nearly in all sectors is the growth rate of value added of the sectors. Finally, comparing the effect of wage and value added, the estimation result found a policy promoting value added would be more effective than a policy relaying on the low wages to stimulate employment.

Banga (2005) examined the impact of FDI, trade and technology on wages and employment in Indian organized manufacturing industry using GMM. His study revealed that higher extent of FDI in an industry leads to higher wage rate in an industry and higher export intensity of an industry increase employment but has no effect on its wage rate and technological progress found to be labor saving. Unlike his theoretical framework, Banga found FDI does not have a significant impact on employment. This shows that FDI in Indian manufacturing has contributed to employment in the industry. A plausible reason for this paradox is the FDI in India manufacturing has not entered export-oriented industries bus has mainly entered capital intensive industries like chemicals, automobiles, pharmaceuticals etc. Similarly, technological progress found to have negative impact on employment since import of technology in Indian labor surplus is labor substituting in nature.

Using total productivity model Yong (1993) investigate the existence of enormous dynamic gain form outward oriented policies in the case of NICs. His Purchasing power parity data set indicates that it would be a mistake to conclude that East Asian NICS are primary example for the potential dynamic gains from outward oriented policies but the extraordinary and sustained nature of growth is due to rapid factor accumulations of both capital and labor and the sectoral reallocations of resources "static" neo-classical gains which sustained the growth of these economies for more than 20 years explained the lion share of the east Asian growth miracle, both in aggregate economy and in the manufacturing sector. He also found outward oriented policies helps the NICs to expand manufacturing employment and output

Maredza et al. (2013) investigated the labor demand in textiles, clothing and footwear manufacturing sector of South Africa using the VAR model. Their Johansen co integration test results indicates in the long run manufacturing output positively significant and also correlated to the labor demand (one percent increase in output leads to 16 percent increment in employment of labor) while imports and interest rate ratio negatively significant to determine employment. Furthermore, their impulse response analysis revealed that a one period shock to the manufacturing output increase employment about 4% until the fourth quarter where the impact die off while a single period shocks in interest rate reduces employment by 2% but the impulse dies after about the third quarters.

Generalized methods of moments procedures deployed by Getinet et al. (ND) to assess the in imported technological change and manufacturing employment in Ethiopia over the period of 1996-2004. They implemented a two equation dynamic framework that depicts enterprises level employment trends separately for skilled and unskilled workers. Their empirical results found real output, investment, foreign ownership (proxed by FDI),export and locations are significantly positive reflecting employment enhancing effects to varying level of significance. In terms of magnitude, the export ratio variable is the primary in enhancing labor demand.

On average, when firms are exporting, their labor demand increased by 116.5 percentage points and followed by the location of firms, i.e. Firms that are located in the capital region are the large firms that hire more workers (demand for labor of firms located in the capital region is found to be increased by 19 percentage points). The second set of their regression result indicates that both unskilled and skilled workers have a direct positive effect on employment and in terms of magnitude; the effect of unskilled workers is higher than that of the skilled workers.

The possible explanation for this observation is that demand for unskilled workers is more elastic given the case with which such workers can be substituted visa-a-visa their skilled counterparts. The impacts of skilled and unskilled workers have positively significant effect both on output, investment and locations of firms while the share of ownership (FDI) found to have significant effect only for skilled workers. Finally, contrary to the theoretical expectations the export effect is skilled bias, and found to be significant for unskilled labor but not for skilled labor. They believed that the positive effect on total employment observed earlier originates mainly from higher demand for unskilled rather than skilled labor and conclude the process of "learning by exporting" is not evident in Ethiopia, at least not for the time period considered.

Partially similar to above study Castejon and Woerz (2006) studied the influence of FDI on productivity whether it's good or bad using a panel date at industry level of 35 countries in OECD, Asia and Eastern Europe from 1987-2002. Their GMM estimation result showed that domestic investment and increased openness have a positive direct effect on labor productivity of manufacturing industries and both seen to be more important for the growth lower-tech, resource intensive industries like petroleum, chemicals, food and textiles particularly in catching-up countries[2] while the effect of FDI found to be insignificant(Independently). However, the effect of FDI on manufacturing productivity become marginally positive depends on the additional factors i.e. a sufficient level of domestic investment or export orientation is necessary condition. In other words, FDI and domestic investment or export is complementary. Unlikely to the theoretical expectations, the effect of human capital (proxed by level of schooling) on FDI is significantly negative. Their justification for this result includes, the study excludes the really human capital poor African countries and other LDCs plus all countries under study exceed the threshold level for human capital.

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[2] *Catching–up countries include countries that are less advanced countries per the Authors different groups of catching up countries: (OECD members ;Greece, Mexico, Portugal, Spain, Turkey), the four Asian Tigers (Taiwan, Hong Kong, Korea, Singapore), Emerging Asia (Indonesia, Malaysia, Philippines, Thailand) and CEECs (Croatia, Czech Rep., Hungary, Latvia, Poland, Slovak Rep.,*

Using different techniques Almayehu (2002) analyzed the manufacturing sector and trade liberalization in Ethiopia. His fixed effect model estimation results indicated that the real output decreases before the reform period and increases after due to change in trade policies that makes inputs (imported raw materials) accessible for the production. Similarly sales of manufacturing industries had the same trend but on average export sales of manufacturing sector before the reform period slightly higher (14%) than after the then reform period (13%). The expenditures on fixed asset which used as a proxy for investment made in manufacturing industry shows a fluctuation trend on average, but the value added increased after the reform period dramatically that was declined before the reform period though the structural change in the manufacturing is nil due to the extent of low linkages between the manufacturing sectors and the manufacturing employment had almost remained the same during the reform periods, except the decline during 1990/91 and 1991/92 due to retrenchment program in some public owned firms.

Yusoff and Sallah (2013) examined the importance of Malaysian manufacturing industries to the domestic economy using OLS estimates the demand for labor as a function of wage rate, output and capital(proxed by value of fixed asset) . Their finding revealed that manufacturing sectors has been contributing significantly to the Malaysian's economy in terms of its contributions to the GDP, employment and exports. The OLS results indicate wage rates, output production, and capital were all important determinants of labor employment in the manufacturing sectors of Malaysia. Although their elasticity's with respect to the employment of labor were inelastic, the demand for the labor was relatively more responsive to the changes in the output and capital than the wage rate.

Correspondingly Almas Heshamati et al. (2003) found similar results using a dynamic fixed effect model to a panel of six Tunisian manufacturing industries over the period of 1971-1996.They defined labor requirement frontier to investigate the process of adjustment in employment as a function of real wage, output, and nature of technology , production (proxed by capital stock) and time. They find the response of Tunisian employment to the wage change vary from industry to industry. For instance, employment responds greatly to the wages in the textiles, clothing and leather, foods, and chemical industries while less responsive in construction materials, ceramic industry and other industry but on average wage effect is significant negative. The value added respond to the employment is positively significant and like wage rate the

response vary from industry to industry while the capital stock elasticity is negative in the long run but positive in the short run. Generally, the long run elasticity values showed that employment is more responsive to the value added followed by capital stock and least by wage and employment growth is mainly from output growth than altered capital.

CHAPTER THREE: AN OVERVIEW OF ETHIOPIAN ECONOMY

The introduction of modern industries began at the end of 19th century although Ethiopia had long traditions in the development of handicrafts and cottage activities like weaving, blacksmithing, pottery and wood working. The industrial sector has undergone different regimes with different ideology in terms of ownership, policy and strategy, distribution and others but the most common in different studies and data availability are imperial, Derg and the Post Derg period. Each government has its own contribution for the current level of industrialization in terms of output, foreign exchange earnings, regional distribution, and employment .These contribution and other relevant issues are discussed under this chapter descriptively.

3.1 Economic policy and trends of manufacturing sector under the Imperial Regime

The level of industrialization was at an incipient stage during the imperial period. In 1950's the imperial government made an effort in developing of modern industrial sector by designing the three five year plan that was the first five year plan 1957-1961,the second 1962-66 and the third from 1967 to 1971. These development targeted to encourage foreign investment and the main agent were foreign nationals that residing in Ethiopia. A number of incentives were given such as tax holidays, easy financing loans through the Ethiopian investment corporation and development bank of Ethiopia, tax exemptions, remittance of foreign exchange, import and export duty relief, and effective tariff protections from foreign competition.

In the 1960s and early 1970s, manufacturing activity increased as the government, five years plans diversified the economy by encouraging agro-industry activity and by substituting domestically produced goods for imported items. Thus, according to the World Bank, manufacturing production increased at an annual rate of 6.1%. Despite this favorable growth rate, manufacturing in 1973/74 accounted for less than 6% of the total GDP and employed only about 60000 people. Handicrafts such as weaving, pottery, blacksmithing, leather working, jewelry making, along with other small scale industries, accounted for another 5% of GDP.

Table 3.1: GDP by Industry at constant factor price in Millions of Birr

Industry	*1960/61*	*1961/62*	*1962/63*	*1963/64*	*1964/65*	*1965/66*	*1966/67*	*1967/68*	*1968/69*	*1969/70*	*1970/71*	*1971/72*	*1972/73*	*1973/74*
Mining & Quarrying	*4.1*	*4.5*	*5*	*5.9*	*9.5*	*11.3*	*11.1*	*10.3*	*13.2*	*11.5*	*12*	*11.6*	*12.7*	*12.1*
Large & Medium scale Ind.	*98.7*	*113.1*	*126.8*	*153.6*	*179.5*	*208.3*	*224.4*	*253.5*	*283.8*	*314.6*	*356*	*368.8*	*394*	*389.8*
Handicrafts & Small scale ind.	*146.3*	*147.1*	*154.6*	*166.1*	*172.6*	*187.6*	*196.6*	*209.7*	*232.6*	*251.1*	*265.6*	*277.9*	*287.3*	*284.6*
Construction	*189.8*	*209.7*	*215.6*	*227.1*	*240.6*	*271.6*	*315.7*	*317*	*310.9*	*284.4*	*303.5*	*320.4*	*314.4*	*311.8*
Electricity and Water	*10.3*	*13.1*	*15.4*	*18.4*	*22*	*24.4*	*28.4*	*31.2*	*32.7*	*35.2*	*39.7*	*41.5*	*43.9*	*46.5*
LMSMI'S Share to the Industry	*22.0*	*25.2*	*28.2*	*34.2*	*40*	*46.4*	*50*	*56.4*	*63.2*	*70*	*79.3*	*82.1*	*87.7*	*86.8*
LMSMI's share to GDP	*2.4*	*2.6*	*2.8*	*3.2*	*3.6*	*4.0*	*4.1*	*4.5*	*4.8*	*5.1*	*5.6*	*5.5*	*5.8*	*5.6*

Source; Self computed based on MoFED

The above Table shows that the last five years of industrial plan was successful in terms of LMSMI contributions to the industry though its share to the total GDP was small and unsatisfactory. For instance, from 1971 to 1974 the share of LMSMI to the industry was more than 85% while the share to the GDP was less than 6%. But, if we consider for the period between 1960 to1974 the construction sector take the lead both in contributing to the GDP and the industry as well and the least by mining and quarrying.

In the 1972, there were 26 different factories around Addis Ababa, Dire Dawa, Harare, Mistewa and Asmara. Out of these only two were government owned. There were eleven factories that have been established during the 1928 and 1940, except artistic printing press and ambo mineral water factories, the rest were established during the Italian occupations. Industrial capitalism expanded during the year 1941 and 1952 and it was at this time the Ethiopian government strengthened its relations with US and Great Britain. This relationship gave way for establishment of more factories for the production of ceramics and other wood products.

During the last year of the imperial era, the main strategy for industrial development was import substitutions, a process assisted by a system of import duties intended to encourage the domestic production of goods and to discourage imported goods. The then government had placed much faith on private foreign investment and it had gone to considerable length to attract it. As a result of the existing policies and enabling investment environment, a number of manufacturing establishments were created. For instance, the share of large and medium industries (from1960to1974) increased from 1.9% to 4.5% in terms of GDP; the total value of the production factories increased from 219.7 million birr in 1964 to 890.2 million birr in 1973.

Although the trend was widely encouraged in the last few years of the imperial government, the actual level of manufacturing activity and its employment creation (less 60000 employed) was too low compared with other developing countries. Poor infrastructural facilities, shortage of manpower and poor level of government economic policy towards the development of the sector were the main constraints for the performance of industrial sector.

3.2 Economic policy and trends of manufacturing sector under the Derg Regime

Following the over through of the imperial regime the economic system changed radically more particularly in the industrial sector in terms of nature, ownership and management. In 1975 the Derg nationalized almost all medium and large scale enterprises and subsequently reorganized them into state owned corporations. On the same year, the government realized a new economic policy and identified three manufacturing areas slated for state involvement: basic industries that produced goods serving other industries and that had the capacity to create linkages in the economy: industries that produced essential goods for the general population; and industries that made drugs, medicine, tobacco and beverages. The policy also grouped areas of the public and private sectors into activities reserved for the state, activities where state and private could operate jointly, and activities left to the private sector.

In order to implement its policy the military government imposed capital ceiling on private sectors investment limited to half million birr and investors were not allowed to have license for more than one line of business, very harsh tax with a maximum rate on the personal income going as high as 89%, high interest rate for private borrowers relative to public enterprises and cooperatives. And, these resulted decline in private direct investment from 65 million birr in 1974 to 12 million in 1977 according to the national bank of Ethiopia.

Later on due to the internal pressure from the private sectors and external influences like the prohibiting of US funds for the development purpose, forced the Dreg government to amend its policy and as result the ten year perspective plan 1984/85 -1993/94 designed to promote the production of intermediate and capital goods, and the expansion of small scale industries. The plan offered incentives such as a five year period of income tax relief for new projects, import and export duty relief, tariff protections, and repatriation of profits and capital. However, it failed to attract foreign investors , largely because foreign business were hesitant to invest in country since their holdings limited to below 50 percent and government reserved the right to purchase all shares in a joint venture " for reasons of national interest".

The following table 3.2 indicates the GDP of the industrial sector for the period of 1974 to 1991. The table tells us almost every aspects of the industry had downward trends as compare to the imperial period. For instance, on average, the growth of the industry declined from 2.7% to 2.28%, growth of LMSMI declined from 6% to 4.3%, and the share of LMSMI to the GDP from 4.9% to 3.21% and to the industry from 37% to 27%. Moreover, the growth of the industry as whole and LMSMI in particular showed a negative growth at the beginning and the last three consecutive years of Derg period and this may be due to the civil war for both extremes.

Table 3.2: GDP at constant price (In millions of Birr)

Period	Industry					Growth of industry	Growth of large & Medium	%Δ of Large & Medium to GDP
	Mining & quarrying	Large & Medium	Small & Cottage	Electricity & Water	Constructions			
1974/75	98.3	912.9	735.7	551.4	1631.5	(0.11)	(1.07)	2.46
1975/76	87.8	898.9	730.0	549.1	1601.2	(1.61)	(1.56)	2.40
1976/77	73.1	905.8	731.8	532.1	1308.1	8.15	0.81	2.42
1977/78	65.8	926.9	740.4	540.8	1391.9	3.22	2.33	2.46
1978/79	63.4	890.6	726.1	544.3	1328.5	3.07	(3.92)	2.40
1979/80	63.4	1133.5	755.3	629.7	1431.1	12.95	27.27	2.84
1980/81	65.8	1252.4	774.2	659.4	1670.2	10.19	10.57	3.08
1981/82	65.8	1324.5	793.3	687.4	1679.1	2.90	5.75	3.28
1982/83	78.6	1407.8	843.3	732.4	1905.7	9.17	6.29	3.17
1983/84	80.2	1444.4	936.5	766.7	2051.1	6.26	2.60	3.12
1984/85	99.8	1567.4	882.5	770.7	2294.7	6.37	8.52	4.14
1985/86	130.1	1493.2	816.3	810.4	2772.0	7.24	(4.74)	3.62
1986/87	128.4	1655.7	943.1	869.6	2733.0	5.11	10.88	3.62
1987/88	113.2	1843.6	1023.1	916.8	2893.8	7.28	11.35	3.87
1988/89	89.0	1905.8	946.7	973.9	2527.3	(5.12)	3.37	3.95
1989/90	107.8	1875.3	852.2	1013.7	2095.	(7.73)	(1.60)	3.86
1990/91	101.9	1814.2	841.0	1038.1	1684.8	(6.14)	(3.26)	3.61
	Average					2.28	4.32	3.21

Source: NBE (Self computed) based on data from CSA annual report

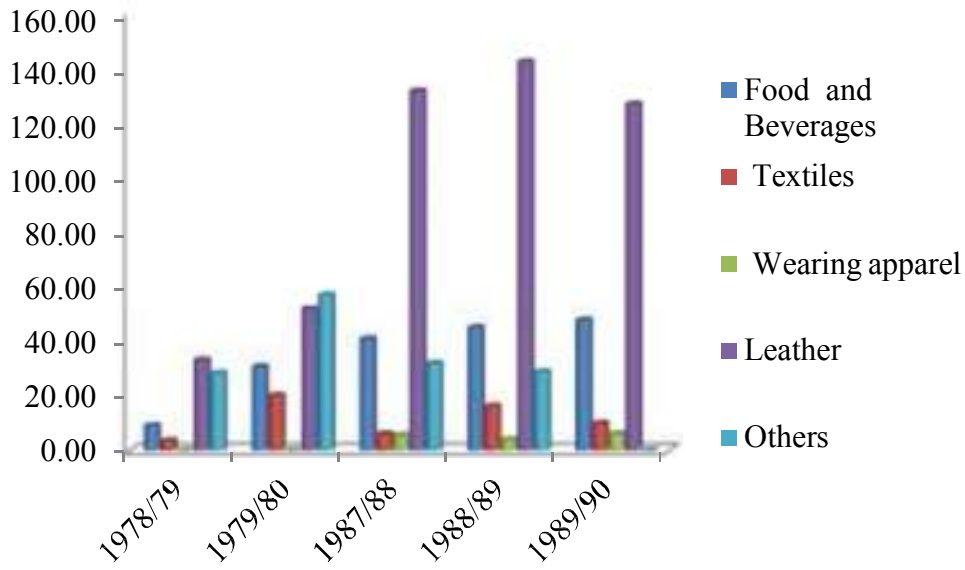
Regarding to the export, the composition of exports had remained essentially the same with the imperial regime, although the relative share of various agricultural exports had changed exports relative share to the GDP declined largely because domestic production grew more slowly than the total demand. This could be attributed to the agricultural crisis associated with the country's recurring droughts and famine and the dislocation of the farm economy resulting from the

revolution. Total domestic production measured by the GDP, grew at an average annual rate of 0.9% per year during the 1980 to 1987 period while exports declined at an average rate of 0.6.

The Figure 3.1 indicates the export of large and medium scale products of Derg government for five years: the first two years are the beginning of its governance and the export items were almost same with the imperial period. Furthermore, the nature of export did not have consistency meaning items that exported in one year were not repeated in the other years.

The last three year of the Derg period shows a remarkable result of large and medium scale export which was 28% of the total export and the lion share was gained from tanning, footwear and dressing of leather products followed by food and beverages.

Figure 3.1: Export of Industrial Group (in Millions of Birr)

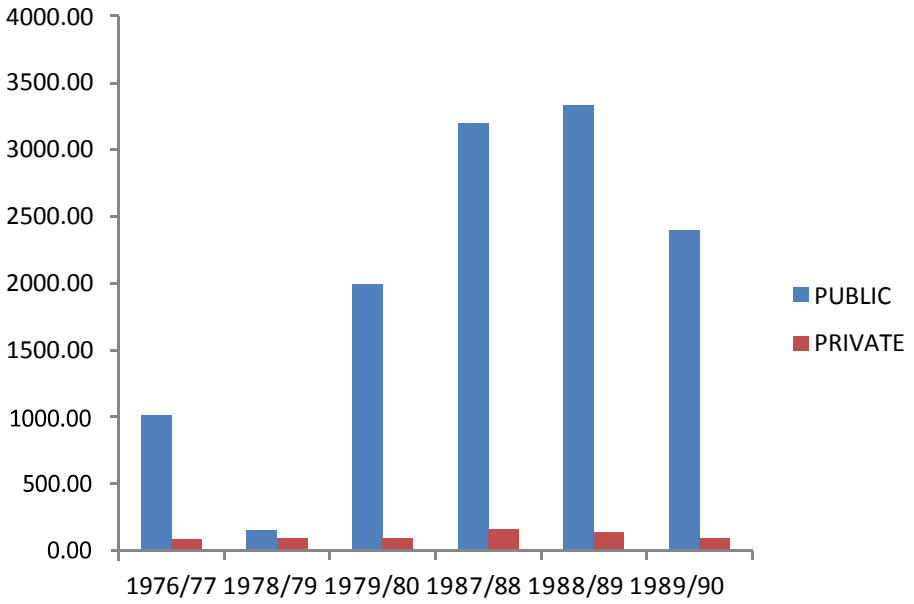


Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey, (various issues)

In terms of ownership for the same period, the gross value of production owned by the public where the share of private sector was less than five percent while more than 94% was contributed by the public. And this result is the reflection of the policy of the Derg that only favor the public manufactures at the expense of the private manufacturers and hence the export of the country depends on the performance of the public one instead of the private one. As shown in Fig 3.2, for

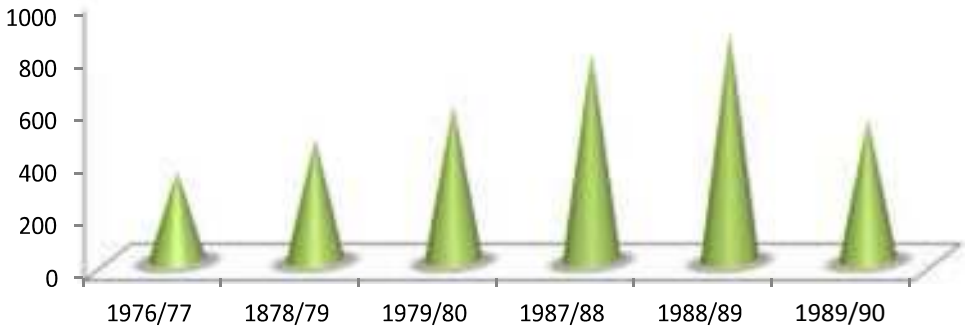
the whole period mentioned there were huge gap between the private and public sector ownership in terms of gross value production of large and medium scale manufacturing.

Figure 3.2: Gross value of production at Market price (in millions of Birr)



Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey, (various issues)

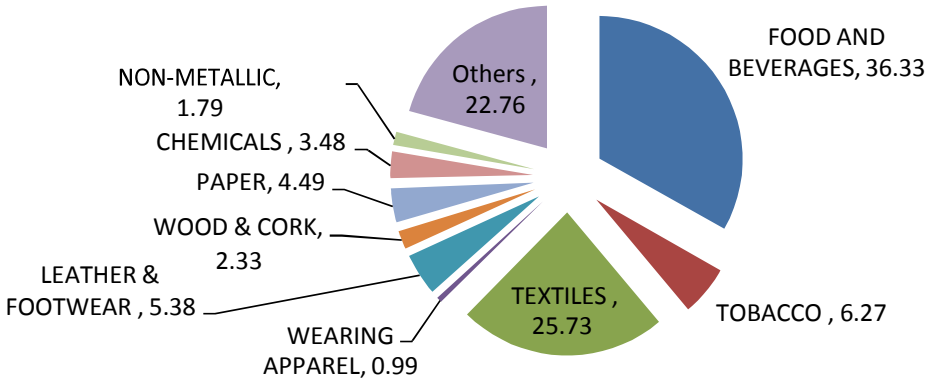
Figure 3.3: Value Added in National Income Accounting concept (at factor cost in thousands of birr)



Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey

The above figure shows the value added by large and medium scale manufactures had an increasing trend except the last year of the Derg period which was the time of civil war and end of its governance and hence resulted a negative growth in the industry while the increments were due to the implementation of the ten year plan that pay attention to the industrial sector more importantly to the manufacturing sectors. Similarly to the gross value of production the primary contribution was from public manufactures and the food and beverages had a lion share in terms of value added to large and medium scale followed by textiles.

Figure 3.4: Percentage distributions of value added by Industrial Group 1976/77, 1978/79, 1979/80



Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey, (various issues)

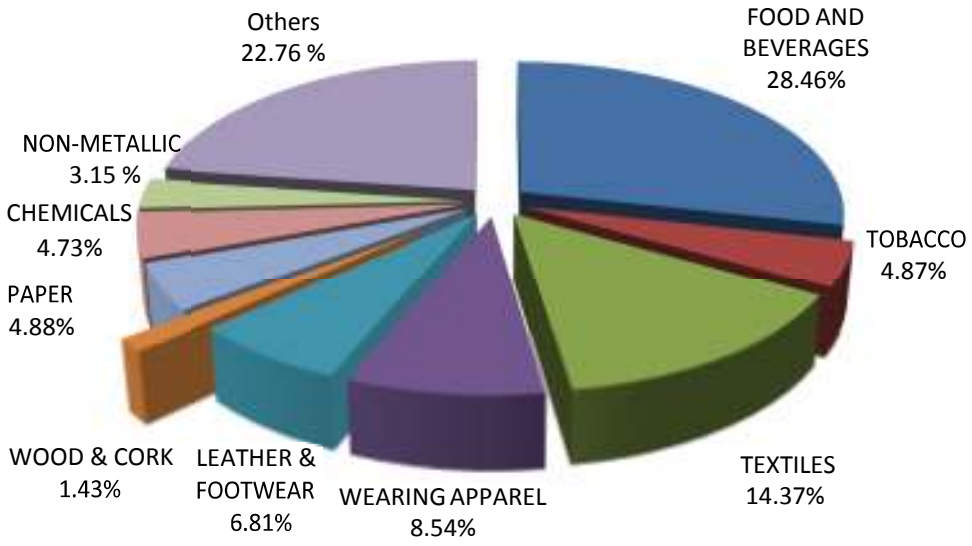
Both figure 3.4 and 3.5 shows the share of industrial groups by value added in the first three years and last three years of the Derg period and the result tells us more than 65% of value added were contributed by three manufacturing namely and ascendingly in terms of share were tobacco, textiles and food and beverages.

Regarding the distributions of LMSMI by regional state and industrial group based on CSA annual survey of 1976/77 shows that total number of establishments was 420 and food and beverages rank first in terms of establishment. Among the regions of the country during the same

year in references the Derg classifications Showa (includes the current Amhara and Addis Ababa) contributed alone 61% of the total establishment and Asmara took 20% establishments while the other regions (called kiflehager at that period) contributed 19% for the total establishments. But at the end of its period, 1989/90, the number of establishment decline to 313 due to the policy that merged the private manufacturing with the public and those did not work with the state forced to terminate. However, the contribution by regions to the total establishment remains the same.

In 1978/79 there were 76895 workers that engaged in the large and medium scale and out of these 72113 were permanent employees. The number of engaged in the industry increased by 8.5% in 1988/89 and also the number of permanent employees increased to 89546 in similar year. In terms of composition the primary share goes to textiles following food & beverages.

Figure 3.5: Percentage Distributions of value added by industrial group 1987/88-1989/90



Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey, (various issues)

3.3 Economic policy and trends of Manufacturing sector Post Derg Regime

After the overthrow of the socialist government and its replacement by the Ethiopian people's revolutionary democratic front, EPRDF, the government sought to rationalize its role in the economy while enhancing the active participation of the private sector. Accordingly, the TGE announced an economic policy which could be described as "cautious Capitalism". Based on the new economic policy the government formulated a long term economic development policy ADLI which is geared towards the transformation of the backward economic structure. It's is a two-pronged strategy, incorporating on one side the external sector(Export led part) and on the other side the internal sector which shows the forward and the backward linkages between the agriculture and industry. Theses linkages can be understood in two ways:

A. Agriculture will provide for domestic food requirements, supply industrial inputs and provide commodities for export
B. Development of agriculture expands market for domestic manufacturers and hence its manufacturing potential to export to the rest of the world

The trade and industrial policy of TGE, has put in place the principles that primarily focus on the promotion of ADLI, exported development, and expansion of labor intensive industries. With respect to the industrial sector, the TGE indicated that the role of the state would be limited to areas of the large scale industries, metallurgical plants, communications, power and pharmaceutical industries in which the private sector may not able to undertake. The government, therefore, undertook a public enterprises reform programme in august 1992 that aimed at enhancing efficiency, productivity and competitiveness in public enterprises (most of which were manufacturing) through the granting of managerial autonomy and responsibility. This was done by dismantling the sub sectoral corporation under the ministry of industry.

Unlike the Derg government, the TGE taken important actions to encourage private sector participation in the economy and some of these includes: lifting the restrictions on the private sector investment and the number of business ventures, easing of licensing requirements and regulations, investment incentives like tax holidays, duty free importation of investment goods, affordable interest rate (loan) and the downward revision of taxes and tariffs. In general, these measures were designed with the long term objectives of raising the share of the industrial sector in the economy both in terms of output and employment creation and enhancing the development

of the strategic industries which were expected to have multiplier effects through the expansion and development of other economic activities.

Furthermore leading government has long subscribed to the goals of human development and poverty eradications as guiding principles for its development strategy and programs. To meet these goals the government committed itself towards achieving the millions goals by 2015 and at large to become middle income country by 2020-23. The MDGs needs assessment methodology paper suggests that the low income country government should follow three stage planning process to align their respective domestic policies, strategies and programs with the MDGs. Accordingly, the government planned three stage programs of which two are already accomplished and the last program remains one year only, namely and respectively are SDPRP from 2002/03 to 2004/05, PASDEP from 2005/06 to 2009/10 and GTP from 2010/11 to 2014/15. SDPRP were to build a free market economic system in the country which enables the economy to develop rapidly, to end dependence on food aid, and to allow poor people to benefit from economic growth. Among the SDPRP targets that were related to industrial sector includes:

- Strengthen private sector growth especially in the industry, to promote off farm employment and output growth supported by public investment is necessary infrastructure
- Rapid export growth, including high value agricultural products and export oriented manufacturing sectors (particularly intensified processing of high quality skins, leather and textiles garments.

The PASDEP represents the second phase of the PRSP process which begun under the SDPRP. The major focus was on growth with a particular emphasis on greater commercialization of agricultural and the private sector and ascending up of efforts to achieving the MDGs.

Similar to SDPRP and PASDEP sustaining rapid and equitable growth are central to the GTP and GTP in particular provides support to the following sectors: labor-intensive sectors with large market potential; sectors with vertical and horizontal linkages to agriculture, such as leather, which add value to domestic agricultural products and thus help keep value chain and associated income and employment opportunities within the country; export-oriented and import-substituting sectors; and sectors that facilitate technology transfer between sectors and between countries. The GTP also gives particular support to Ethiopia's micro and small-

scale enterprises, which the GTP drafters see as the foundation for the development of future medium- and large-scale enterprises. Comparing the two past programs, the GTP has better and clear directions towards the improvement and measurements of the industrial sector. For instance, two growth scenarios are considered under the GTP: base case scenarios the industry should grow at 20% and 21.4% in high case scenarios.

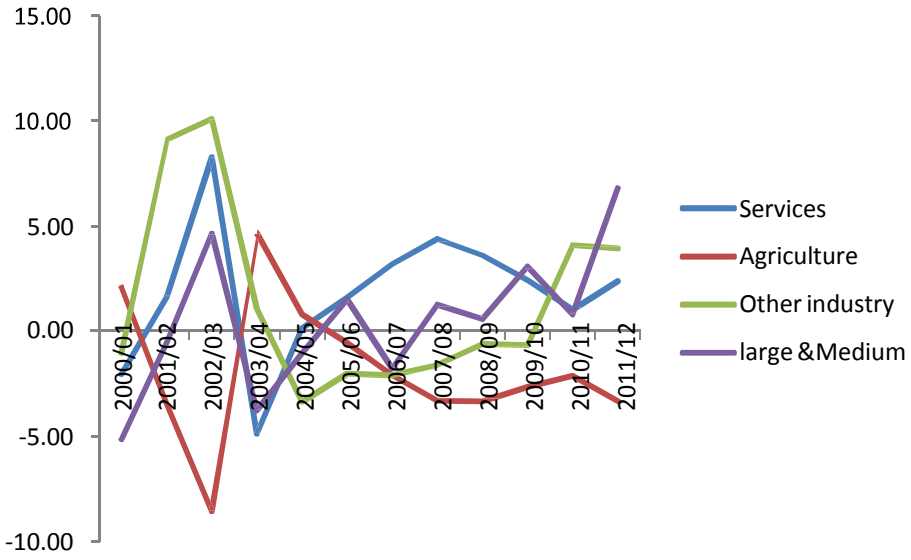
The large and medium scale manufacturing survey of CSA in 1995/96 showed that the distributions of large and medium scale manufacturing by regional sates and industrial groups almost double by establishments, 642 industries. The survey demonstrates that for the country as whole, manufacture of food products and beverages industrial group's ranks first in terms of number of establishments. This accounts 27.10% of establishments in the sector followed by non-metallic industrial products which constituted 13.24% of total number of large and medium scale manufacturing industries. This means that the share of the two industrial groups alone was 40.34% of the overall industrial groups, leaving only 59.66% for the other 13 industrial groups.

Therefore, Ethiopian large and medium scale manufacturing industry is mainly characterized by high concentration of food and beverages products of the industrial groups. The output by food and beverage industries among many others includes the production of consumer goods which have low international demand and price like bread, edible oil, soft drinks, beer and alcohol drinks. Among the regions of the country, Addis Ababa contributed 68.22 percent of the total establishment during the same period. This high concentration of industries in Addis Ababa is due to proxy to central market, high demand, choice of labor force type and infrastructural developments are major ones. Following Addis Ababa, Oromia ,Amhara, SNNP, Dire Dawa and Tigray are the next five regional state that constitutes 11.06, 6.23, 5.45, 3.89 and3.27 percent of the total establishments respectively.

After seventeen years, based on the 2012/13 LMSMI annual survey, same trends observed in terms of regional distribution and industrial group share. Meaning, still the food and beverages products take the lead by number of establishments, non -metallic industries and furniture take the second and third in terms of establishments. Three of them had a share of 64.54% from the total establishments of large and medium scale manufacturing where each has an individual share of 25.88%, 21.05% and 14.61% respectively while the remaining 35.46% is shared by other twelve industrial groups. Though the highest share of LMSMI still dominated by Addis Ababa in terms of regional distributions but its share from the total regional distributions declines

to 33.22% while others regions shows an increases trends. Among these, Oromia, Amhara and SNNP has share of 29.45%,11.83% and 11.37% respectively and the rest 14.13% is shared by the remaining seven regions.

Figure 3.6: Growth Shares of Sectors to GDP, in %



Source: Computed based on data from MOFED

Likely its leading contribution to the GDP growth, the services sector has a primary role to the growth share of GDP (increased by 2.6% since PASDEP) particularly since the implementation of PASDEP no negative growth share observed but during SDPRP and before SDPRP the growth share of the services showed fluctuations. For instance, in 2003/04 the services growth share to the GDP declines to negative 5% from 8% of 2002/03. On the other hand, the agricultural sector growth share to the GDP has a continually a declining trends specifically both in PASDEP and part of GDP, declined by 2.5% on average. Similarly to the Agriculture sector, during the whole PASDEP period the industrial sector growth share to the GDP was negative but on GTP[3] it's positively inconsistence. Moreover, the LMSMI growth share to the industry and also to the GDP is still very small. Case in point, its growth share since PASDEP is 1.73% on average.

[3] *Only includes 2010/11 and 2011/12*

Table 3.3 shows the growth rate and share to the GDP of the industry sector and large and medium scale manufacturing in PASDEP and GTP. Even though, during the PASDEP industrial growth target did not meet the high case scenario[4] both the lower case and average case scenario were accomplished, more than 12% and 10% respectively while the share to the GDP was less than 10% on average. For the same period, the Large and medium scale manufacturing registered less than 12% average growth and 2.49% share to the GDP where this share to GDP is less than what was registered both in the Imperial and in the Derg regime.

During the first four GTP implementation years, the industrial sector registered an average annual growth of 20.88 percent which is higher than the average annual growth by 10 percent of the PASDEP and the share also increased to 12.28 percent. Hence, the GTP growing as expected in referring to the low case scenario though the share to the GDP is still insignificant.

During the same plan years, the LMSMI's registered an average annual growth of 17.20 percent which is higher than the PASDEP but the share to the still has no significant progress and this is an additional indication for the declined growth of real GDP in the GTP as compared to the registered real GDP during the PASDEP and SDPRP which entails the difficulty of sustaining a high growth rate (or extending the recent growth spell).

[4] During the PASDEP the industry were expected to grow: 11%, 18% and 10% at base case, higher case and average scenario respectively. During the GTP –I the industry were expected to grow 20% in base case and 21.40% in higher case scenario

Table 3.3: Growth rate and share to GDP during PASDEP and GTP

3.3.1 Industry

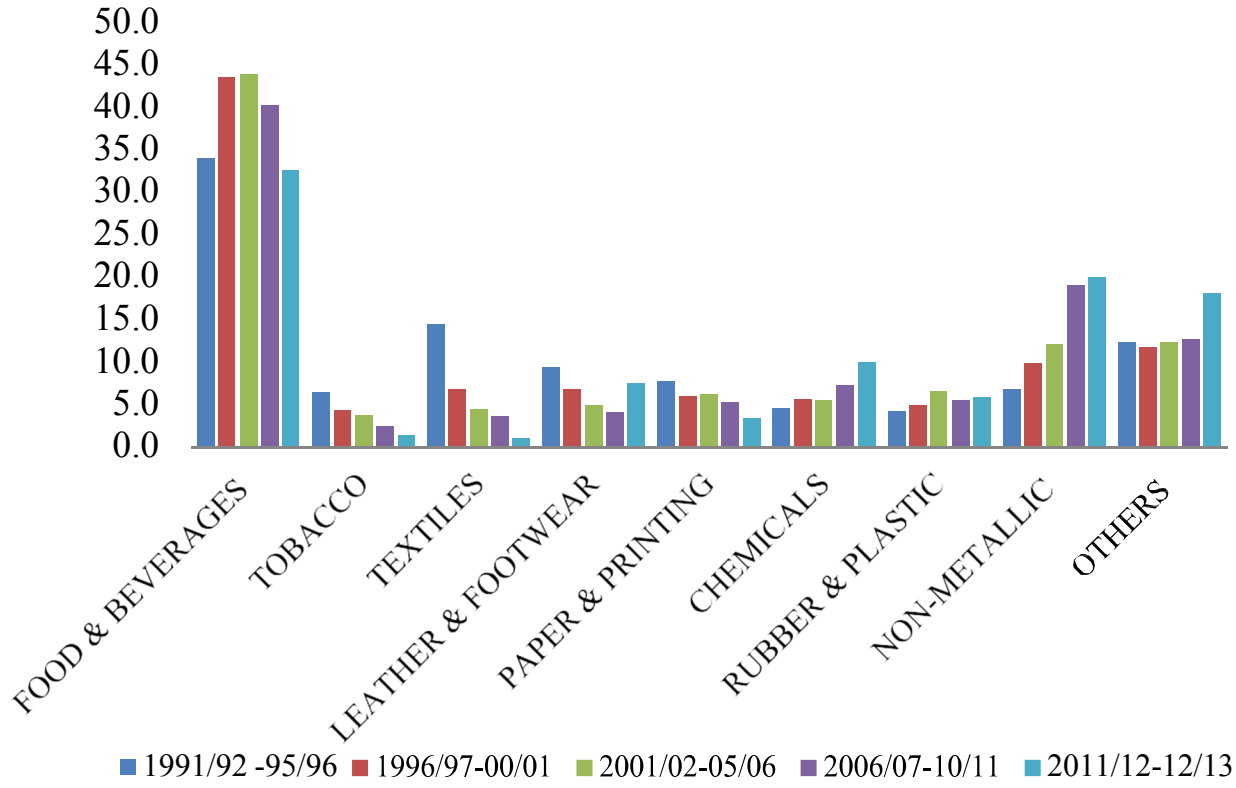
YEAR	Growth	Share to GDP
	PASDEP	
2005/06	9.86	10.10
2006/07	7.79	9.76
2007/08	10.67	9.72
2008/09	9.83	9.73
2009/10	12.72	9.95
TOTAL	50.87	49.27
AVERAGE	10.17	9.85
	GTP	
2010/11	18.56	10.42
2011/12	19.64	11.48
2012/13	24.10	12.97
2013/14	21.21	14.24
TOTAL	83.51	49.11
AVERAGE	20.88	12.28

3.3.2 Large & Medium Manufacturing

YEAR	Growth	Share to GDP
	PASDEP	
2005/06	13.65	2.48
2006/07	9.48	2.44
2007/08	12.58	2.47
2008/09	10.29	2.48
2009/10	13.60	2.56
TOTAL	59.60	12.44
AVERAGE	11.92	2.49
	GTP	
2010/11	14.14	2.58
2011/12	15.90	2.75
2012/13	24.20	3.11
2013/14	14.54	3.23
TOTAL	68.79	11.68
AVERAGE	17.20	2.92

Source: Computed based on MOFED data and CSA Data

Figure 3.7: Percentage distribution of value added by industrial group



Source: computed based on CSA report on large and medium scale manufacturing and Electricity industries survey, (various issues)

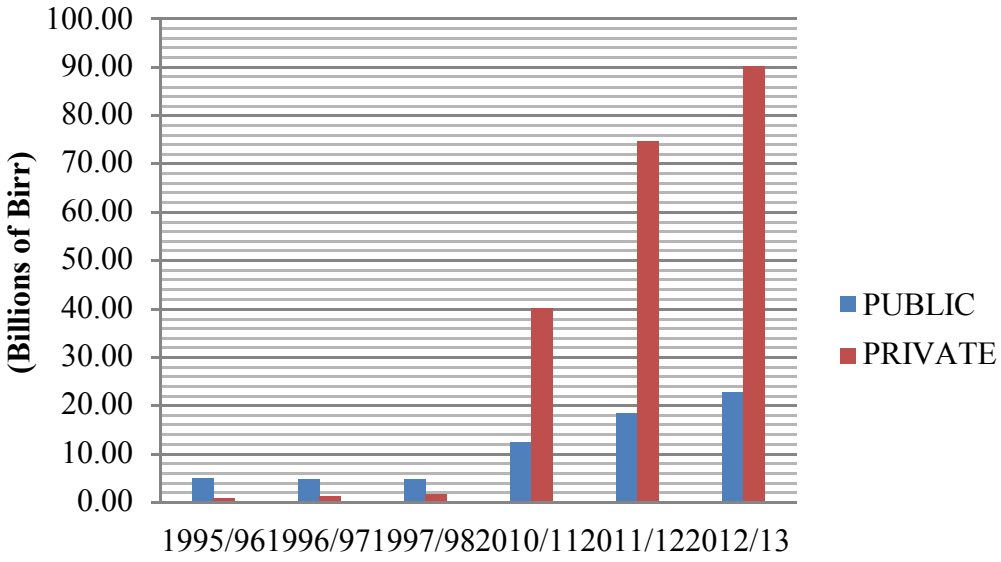
Despite the implementation of industrial development strategies by the past two regimes and even the current government, there is no vibrant change in terms of value added by the industrial groups. As see on the figure 3.7, still the manufacturing of food and beverages products have the highest share of value added in the manufacturing industry, more than 46% on average[5].

Unlike the Derg period where textiles ranked the second, the second and third stage is enclosed by non-metallic minerals and chemical manufacturing products, 17% and 8.3% respectively whereas the lowest percentage value added distribution is found under the machinery & equipment

[5] *the average computation includes the period from 1991/92 to 2012/13*

manufacturing products, 0.18% on average. Since the GTP-I, the Value added share of food and beverages are significantly waning instead the share of chemicals and its products raised from 8% in 2011/12 to 11% and 14% in 2010/11 to 17% in 2012/13.

Figure 3.8: Gross Value of Production by forms of Ownership (at Market Price) 1995/96-1997/98 and 2010/11 – 2012/13



Source: CSA , Report on Large & Medium Scale Manufacturing & Electricity industries Survey

Compared to the previous the regime, the gross value of production until the beginning of the PASDEP had similar trends that was dominated by the public but after the implementation of the second phase to meet the MDGs, PASDEP, and the private production to the gross value became superior to the public production. Specially, the shift from the public to the private is very huge since the implementation of the GTP-I. When the gross value of production by the public increased to 22 billion birr in 2012/13 from 12 billion in 2010/11, the private sector for the same period increased to 90 billion of birr from 40 billion birr. This is attributed by the privatization policies that pay attention to support of public enterprises.

The scale with which a firm operates determines its degree of competitiveness in the market. Large scale enterprises have greater cost advantages to smaller ones, cetrus paribus. The share of large scale manufacturing industries (enterprises which engage 50 persons and above) in the total industry decreased from 34 percent in 2009/10 to 32.9 percent decline in 2011/12 depicting the

dominance of medium scale industries. The reduction could be explained by increased entry of the new medium sized firms, closing down/contracting of existing large scale enterprises, all giving rise to erosion in the scale advantage that the sector can reap. The scale of manufacturing industries varies by ownership structure. Public owned manufacturing industries are mainly large scale while privately owned are mostly medium scale. The share of large scale industries significantly decreased significantly from 84.1 percent in 2009/10 to 75 percent during the second GTP implementation year. (EEA, 2014).

The share of large scale industries in sub-sectors varies from year to year mainly due to the government's privatization of relatively higher number of medium scale manufacturing industries compared with large scale one. For instance, the share of large scale industries in the rubber and plastic sub-sector which was 55.6 percent in 2009/10 became 100 percent large scale in 2010/11. (EEA, 2014)

Table 3.4: Ethiopian exports of Large and medium manufacturing products 1990/91- 2012/13

	1990/91-1994/95	1995/96 to 1999/00	2000/01 to 2004/05	2005/06 to 2009/10	2010/11 to 2012/13
Total LMSMI'S Exports, millions of birr	225.23	416.67	794.22	1157.92	5088.70
Share of LMSMI's exports in total merchandise exports	19.05	12.00	16.97	7.81	9.84
Total LMSMI's exports as % of Industrial GDP	4.29	1.19	3.63	3.36	8.33

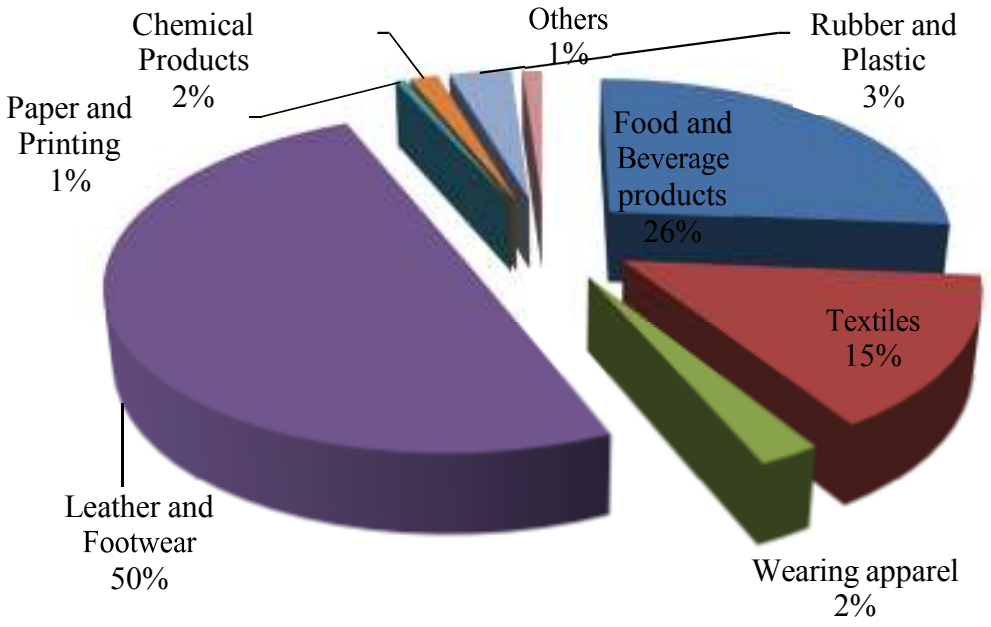
Source: Computed based on MOFED and NBE data

Compared to the Eastern Africa average and some selected Asian countries, the slow pace growth of manufacturing in particular large and medium scale sector also evident in the international market. The large and medium manufacturing export share not only representing low percentage of the total merchandise exports, but also fluctuating as indicating on table above. Similar trends

observed in exports of LMSMI's as share of the industrial GDP but since the GTP both the share to the total merchandise exports and share from industrial GDP has an increasing trends.

Regarding the nature of exporting items still they are consumer goods and the number of exporting items more or less remained stable for long period despite a slight change in textile subsector during the GTP. In addition, the large and medium manufacturing export items lack consistencies, like paper, printing, chemical, rubber, plastic and others. Since 2000/01, the highest revenue from export gained from leather and footwear followed by food and beverages and textiles respectively where three of them alone take 91 percent from the total LMSMI's exports. Similarly, these three items take more than 10 percent share from the total share of LMSMI's (11.32 percent) in the same period.

Figure 3.9: Percentage share of large and medium scale Manufacturing Exports 2000/01-2012/13



Source: Computed based on NBE data and CSA annual Survey of LMSMI's

Table 3.5: Employment, Growth in %

SUB-SECTORS	SDPRP Period			PASDEP Period					GTP Period		
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Food & beverages	5.93	2.58	1.07	12.52	0.07	15.63	8.95	33.71	11.58	-18.76	-3.76
Tobacco	0.00	-0.88	-11.21	8.32	5.83	56.95	-10.53	-12.12	36.11	0.00	-67.88
Textiles	-1.94	4.39	-9.60	6.76	-1.80	-51.11	55.19	29.86	-37.19	142.68	5.79
Wearing apparel, except fur apparel	16.22	-11.03	-31.53	57.29	85.51	0.12	2.36	19.88	-37.89	101.12	-31.31
Leather &footwear	7.30	5.99	3.24	0.01	5.52	2.81	1.91	22.37	30.93	7.90	21.06
Wood & cork, except furniture	27.11	-3.18	-3.28	12.54	14.27	57.51	-33.32	54.48	22.29	1.68	37.53
Paper & printing	4.28	8.35	8.17	7.35	1.27	9.26	-1.07	13.33	0.78	-10.55	7.84
Chemicals	0.43	-0.45	17.83	-5.14	24.03	10.41	3.47	39.27	-12.88	20.56	30.19
Rubber and plastic products	2.27	-0.32	28.64	21.61	10.44	14.54	37.02	15.90	-20.74	16.03	398.45
Non-metallic mineral products	-4.82	16.63	-1.00	11.56	10.34	51.32	17.43	-1.56	-11.56	40.91	53.11
Basic iron and steel	1.24	15.89	3.71	20.43	-9.38	-30.94	28.77	134.85	22.68	-32.01	12.06
Fabricated metal	24.53	1.20	10.86	51.41	-39.32	47.28	13.59	69.56	-39.46	39.42	59.08
Machinery and equipment	28.42	4.92	-13.67	52.94	-49.41	8.19	-8.11	405.29	-24.56	-92.59	689.58
Motor vehicles	-5.82	10.89	9.03	18.18	115.04	-44.91	-2.38	-0.77	-2.87	-2.40	226.26
Furniture	-2.31	2.53	69.45	-34.86	0.44	24.87	11.37	3.85	-21.57	17.80	20.50
Total	**3.33**	**3.92**	**3.58**	**8.48**	**5.19**	**4.62**	**12.96**	**25.74**	**-6.32**	**14.24**	**39.76**

Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey, (various issues)

This shows that instead of moving towards diversification there was concentration in a few commodities. This in turn may destabilize export earnings when external shock occurs. Thus, diversification measures should be put in place so as to cushion the effect of external shocks.

The development of manufacturing industry promoted due to its huge capacity in generating of employment as compare to other sectors and the transformation towards industrialization entails increased share of employment ,value added ,export earnings, real GDP, etc. of manufacturing sector in the economy. However, employment growth in the large and medium scale manufacturing industries shows fluctuation for the whole three consecutive plans and even the growth become negative 6.32 percent in 2010/11 of GTP period. However, the growth of employment in LMSMI's on average, increased from 3.6 percent of SDPRP to 16 percent in the first three years of GTP (Appendix 1). In the case of growing population and huge number of graduates from universities, the performance is so far unsatisfactory. The performance of food and beverages, tobacco and basic iron is very poor during GTP than the PASDEP while Textiles, rubber and plastic and machinery and equipment gained significant employment during the GTP (appendix 1).

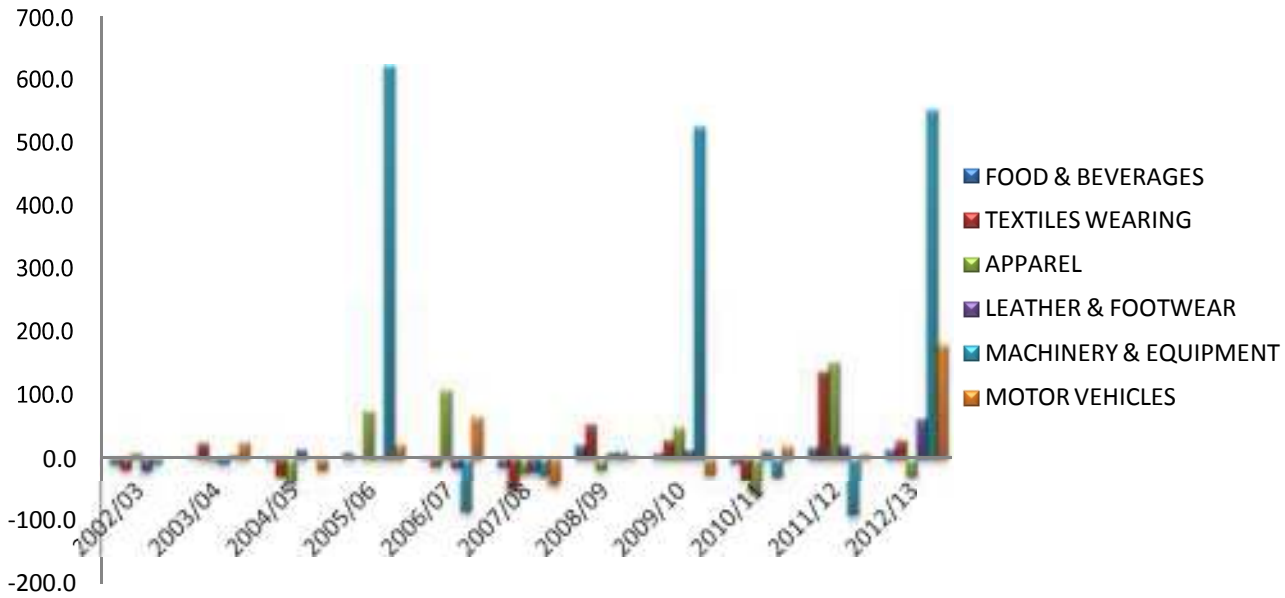
The share of employment in each subsector is also another means to analyze the structure of large and medium scale manufacturing sector. The share of employment in each subsector remained more or less stagnant over a long period plus like others employment in large and medium scale also fluctuating. However, the food and beverages, textiles and wearing apparel subsectors lost significant employment while rubber and plastic, non-metallic mineral and motor vehicles made gain. The share of food and beverages, textiles and wearing apparel in the total drastically decreased from 27.51 percent in 2011/12 to 18.94 percent in 2012/13, 16.45 percent to 12.46 percent and from 5.89 percent to 2.90 for the same period respectively. But, if we take the average for whole period between 2001/02 and 2012/13, still food and beverages has a lion share followed by textiles and non-metallic minerals. These three subsectors including leather and footwear have 62.6 percent share of the total employment while the remaining percent share by the other eleven sub sectors (see appendix 2).

Regarding the composition of the employment, over the past eighteen years 1995/96 to 2012/13 the number of permanent employees increased from 89,596 to 203380. For the same period the number of male employees still superior to females but the number of female employees virtually displayed an increased trend from 28,380 to 85,099. This trend was particularly and evidently observed in the

food and beverages, textiles, rubber and plastic and wearing apparel. In 2012/13, 88.28 percent of female employees engaged in food and beverages (49.63%), textiles (21.37) and rubber and plastic (17.28) while the remaining share divided among the rest thirteen subsectors During 1995/96, 90 percent of females were working in the public enterprises and only 10 percent were in the private sectors while in 2012/13 the reverse happened, i.e. 89 percent engaged in the private sector but only 11 percent engaged in the private enterprises .These paradigm shift registered due to the government privatization of relatively higher number of medium scale manufacturing industries compared with the large scale ones and greater number of females graduates from the universities. (CSA annual report on LMSMI's and Electricity industries)

Another economic variable that mentioned with employment is the wage rate. Wage rate is one of the primary determinant variables for the flow of foreign direct investment. That is why foreign investors are allocating their capital where labor is cheaper. In a country where labor is abundant and unemployment is high, the wage rate will be lower and hence FDI flows into it.

Figure 3.10: Trends in Real Wage Rate, Growth in %



Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey

This helps the producers to minimize cost of production and hence they can easily able to compete in the international market.

On the other hand, an increase in wage leads to an increase in the demand for some goods and services thereby increasing the prices of goods and services. Higher prices increase the cost of living which, in turn, causes wages increases as laborers to be paid more. Higher wages, however, increase production cost for businesses thereby leading to another price rise and the spiral continues.

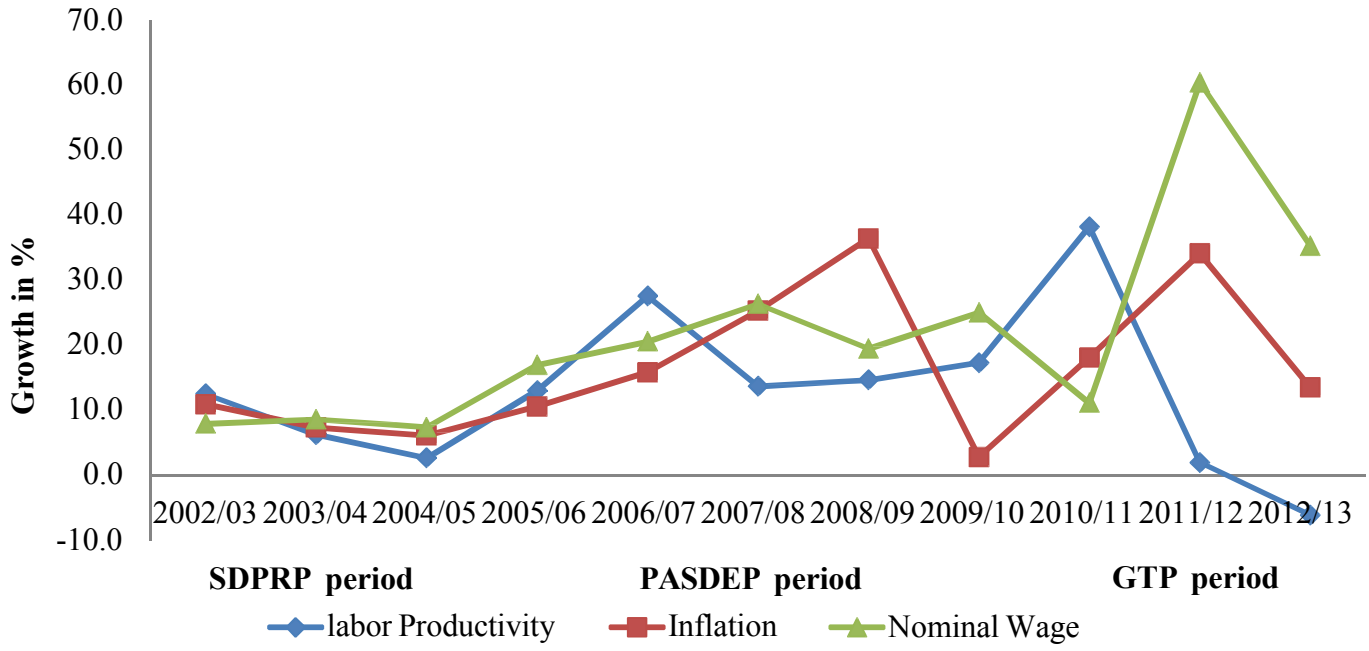
Having cheaper labor is not a sufficient condition for FDI to flow into country: the key factor is its productivity. Generally speaking, as wage gets higher, labor intensive firms move to countries where labor is cheaper. Indeed, if there are reliable suppliers of the key required services. Otherwise, firms resort to automation, by replacing some (but not all) workers with machines. This entails the need to provide the necessary critical supplies that investor's require besides having cheaper labor. Retaining of experienced workers is critical to ensure efficiency since they have sharpened their skill through learning by doing. However, the sector has been facing the problem of retaining experienced factory workers mainly due to departure of workers in search of better pay in the other sectors. Thus, it is important to set wages that reflect the current living cost, inflation and wage rates in other sectors, the level of development and the supply and demand of labor. (EEA, 2014)

Figure 3.10 shows the trends of real wage rate growth where the machinery and equipment take the lead especially from the negative growth level in 2004/05 to more than 600 percent in 2005/06 which is also its peak growth level since 2002. Unlike others features, in terms of real wage rate growth food and beverages registered very slow growth (From 2002 and 2013, its growth rate is 3.4 percent on average only which is third lowest growth rate) (see appendix 3).

However, since the implementation of the GTP almost all subsectors have an increasing trend. This could be due to a relatively higher increase in wage bill compared with the registered inflation during the same period. For instance, during the PASDEP average the food and beverage real wage growth rate was 4.6 percent and increased to 8.2 percent for the first three years average of the GTP, textiles from 3.7 percent to 43.9 percent and leather and footwear from negative 3.5 percent to 31.6 percent for the same periods. However, if we consider the

average of the three consecutive mega schemes, the real wage growth rate lead by manufacturing of machinery and equipment, motor vehicles and fabricated metals respectively.

Figure 3.11: Labor Productivity, inflation and Nominal Wage

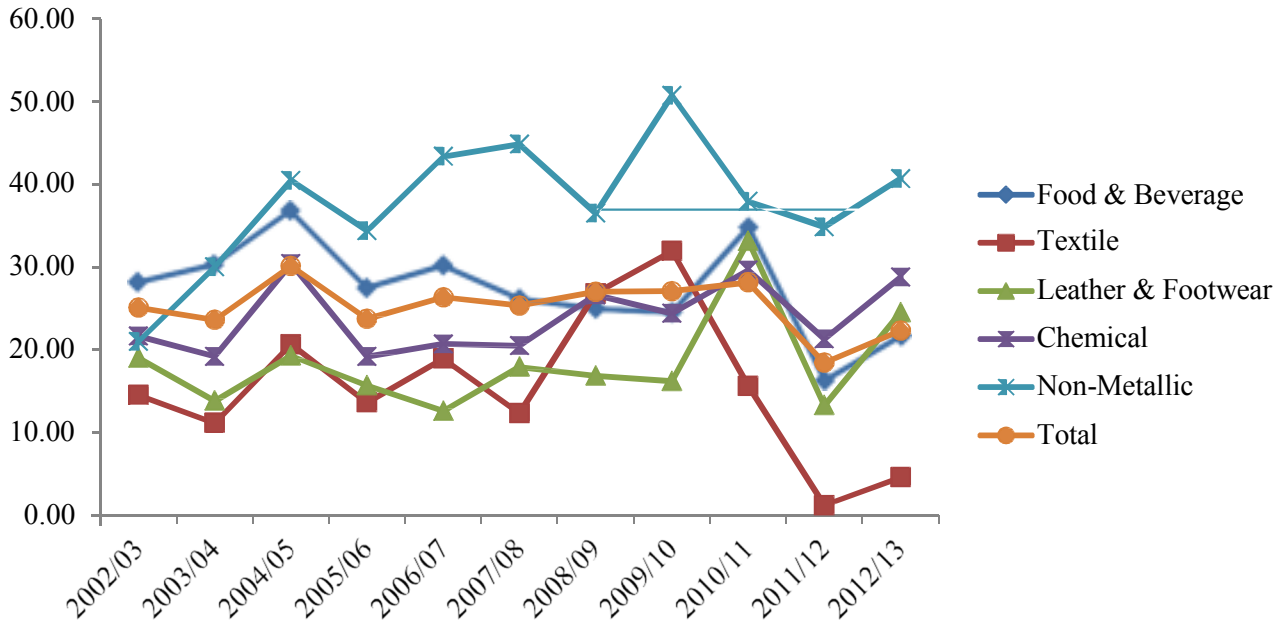


Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey

Labor productivity measured by value added per person engaged in the large and medium scale manufacturing industry which helps to determine the wage rate and develop the competitiveness of firm. The labor productivity growth had an increasing trend in the PASDEP period only while decreasing trends both in SDPRP and the three five years of the GTP which is very sever and even negative 2012/13. But on average, labor productivity growth has been about 12.9 percent, is less than the annual average inflation rate 16.5 percent but lower than the average nominal wage rate growth (21.7 percent) in the 2002/03 -2012/13. (See appendix 4)

Furthermore, competitiveness of firms can be increased by efficiency because it helps to produce greater output from a given level of input. That is why efficient firms are more competitive than less efficient firms. Efficiency is measured by the ratio of value added to the gross value Production.

Figure 3.12: Trends in Efficiency (Value Added to Gross Value Production)



Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey

The highest level of efficiency registered during the last year of SDPRP where 30.12 percent achieved and the lowest during the second year of the GTP-I. The decline in the efficiency of the strategic sub-sectors, during the second year of GTP-I, is very significant. The strategic export-oriented sub sectors happened to the least efficient compared with the industry average. For instance, the efficiency of food and beverage declined to 16.32 percent in 2011/12 from 34.69 percent in 2010/11, textiles from 15.63 percent and leather and footwear from 33.14 percent to 13.29 percent during the same period and even if we see the whole sub-sectors, it declined from 28.14 percent to 18.44 percent. But, there is good progress in 2012/13 since all targeted sub-sectors shows recovery and the efficiency of the whole subsector increased to 22.30 percent (See Appendix 5). Generally, the overall efficiency is very unsatisfactory and hence it's important to made further efforts to reduce wastage and improve efficiency of the export-oriented sector to be competitive in the global market place.

CHAPTER FOUR: MODEL SPECIFICATION AND METHODOLOGY

4.1 Model Specifications

This paper focuses on two major issues: the export determinants of large and medium scale manufacturing sector and employment of labor in large and medium scale manufacturing sector.

First, the study examines the export determinants of large and medium scale manufacturing industry of Ethiopia. The basic issue in relation to export determinant is the competitiveness of the nation and nature of the exported item. Models of trade can essentially be divided into two basic groups – perfect and imperfect substitution models. Given that, empirical evidence shows the prices of goods in different countries do not seem to converge to a single price, the law of one price does not appear to hold. Moreover, in practice both domestic and imported goods can be found coexisting on markets, indicating that countries do not in fact specialize to such a high degree (Cantavella et al., 2009). These imply that the latter model is suitable for this study.

The basic assumption of imperfect substitution model is that neither imports nor exports serve as perfect substitutes for domestic goods. This assumption has for the most part been confirmed empirically, both in the short and in the long run. This study focuses on demand and supply side determinants of Ethiopia's export performance of LMSMI. Hence, the study signifies Ethiopia's export determinants as a function of real GDP to population ratio of home country (Ethiopia), real GDP to population ratio of major trading partners namely Africa excluding Ethiopia, Europe, United States of America and Far East, real effective exchange rate and domestic infrastructural development. Following, the Goldestien and Khan (1985) imperfect substitution model can be expressed as;

$$EXP = f(RGDPPET, DIND, REER, RGDPPAF, RGDPPEU, RGDPPUS, RGDPPFE) - - \quad (1)$$

Where:

EXP = Export Volume of LMSMI

RGDPPET = Real GDP to Population ratio of Ethiopia

DIND = Domestic Infrastructure Development

REER = Real Effective Exchange Rate

RGDPPAF = Real GDP to Population ratio of Africa excluding Ethiopia (Kenya, Sudan, Egypt and Djibouti since they are the only countries that are major export destination of Ethiopia in Africa)

RGDPPEU = Real GDP to Population ratio of Europe (UK, Germany, Italy, Netherlands & France)

RGDPPUS = Real GDP to Population ratio of United States of America

RGDPPFE = Real GDP to Population ratio of Far East (China, Russia and Japan)

All the dependent and independent variables have been transformed into *log* form by applying a logarithmic transformation. This type of specification is more appropriate for the description of nonlinear factors which determine export of LMSMI, with an additional advantage in the fact that it reduces the impact of the size of the sector on estimation results, which could otherwise cause bias toward sectors with a larger share in the total (Khan 2009). Therefore, the regression equation assumes the following:

$$LEXP_t = \beta_0 + \beta_1 LRGDPPET_t + \beta_2 LDIND_t + \beta_3 LREER_t + \beta_4 LRGDPPAF_t + \beta_5 LRGDPPEU_t + \beta_6 LRGDPPUS_t + \beta_7 LRGDPPFE_t + \mu_t \quad ----(2)$$

Where: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6,$ and β_7 are parameters to be estimated (Slope parameters)

- **t** is time and **μ** is the error term

The second issue focuses on employment particularly the factors that affect employment of labor in the LMSMI. In Ethiopia, even though, the economic growth has been creating new jobs opportunities for its citizens, unemployment and underemployment remain critical challenges. For these unparalleled levels of unemployment, several factors are blamed for these situations. Boosting the capacity of manufacturing industry in absorbing of huge number of employees is a primary focus of the government through tax holidays, free land access, credit access at low interest etc. Therefore, it's very indispensable to investigate the factors that affect employment and capacity of the manufacturing sectors of large and medium sub sectors in terms of employment creation.

The investigation of the manufacturing industry in determining of factors that affect employment, LMSMI, is based on the concept of Keynes (1936) theory of employment and

investment. To estimate the impact of different variables on labor demand in the large and medium scale manufacturing sector, the study modified the econometric model of Tafadzwa, Ireen, Andrew, Nehemia and Costa(2013) and hence the basic model becomes;

$$\mathbf{EMP = F\ (RWAG, SKILL, EXP, VAPE, EFF, RIR)} \quad \mathbf{(3)}$$

Where:

EMP= Employment of labor in LMSMI

RWAG= Real wage level

SKILL= Skills of Employees

EXP = Export volume of LMSMI

VAPE= Value added per person engaged

EFF = Efficiency in LMSMI

RIR= Real lending Interest rate

Assuming a linear relationship among explanatory variables, the explicit form of the equation becomes;

$$\mathbf{LEMP_t = \alpha_0 + \alpha_1 LRWAG_t + \alpha_2 LSKILL_t + \alpha_3 LEXP_t + \alpha_4 LVAPE_t + \alpha_5 LEFF_t + \alpha_6 LRIR_t + \varepsilon_t} \quad \mathbf{(4)}$$

Where **t** = time, $\boldsymbol{\varepsilon_t}$ = Stochastic shock **L** = natural logarithm

4.2 Data Sources and Type

The data used for this study were collected from different sources and annual time series data used for the period between 1978/79 to 2012/13. Data on the interest rate, real GDP, exchange rate, inflation rate, and export of major trading partners collected from the National Bank of Ethiopia while data on the value and volume of import and export, employment, wage, value added, skill, gross value of production, commodities exported and imported for the same period were collected from Central Statistics Agency. Real GDP and Population of the major trading partners were collected from World Bank Metadata.

4.3 Descriptions of the Variables

RGDPPMTP: is real gross domestic product to population ratio of the major trading partners (Africa, Europe, USA and Far East) of Ethiopia that will be used as proxy of market size of major trading partners. Ethiopia is one of the countries whose export performance depends on overseas economic situation. As the country is a small open price taker economy in the world market world market forces, generally determine the prices of its exports. Hence, the demand for Ethiopia's export in the world market is influenced by fluctuations in developed countries income and market size. That is, ceteris paribus; an increase in the market size of Ethiopia's trading

partner either due to the output growth of the trade partners, liberalization measures, population or diversification measures increases the demand for our product and hence increase Ethiopia's export earnings. Hence, market size of major trading partners is expected to cause positive effect on the Export performance of LMSMI.

REER: The movement in value of export also correlates with relative prices. In theory, real effective exchange rate movements are also negatively correlated with the growth in exports volume. Thus, the expected sign of the REER coefficient is ambiguous. This is because it depends on the exchange rate regime that the country experiences. According to the Marshal-Lerner condition and Mundel-Fleming model, a decrease in real effective exchange rate or appreciation of domestic currency will make exportable items costly, then the demand for our exports in external market is likely to fall and this in turn will reduce foreign exchange earnings. In such a case, the expected sign of real effective exchange rate will be positive. The reverse is likely to occur; an increase in real exchange rate (devaluation) will increase exports since the price of exporting items is relatively cheaper for buyers and this results a positive role in the competitiveness of the exporting nation at the international market, ceters paribus.

RGDPPET: is real gross domestic product to population ratio of the home economy that is used as proxy for market size. A change in the market size of domestic economy in a given country has a significant impact on the export performance of that nation. Meaning, large domestic market size is a favorable condition to develop the manufacturing export. The advantage of a large domestic market refers to the economic feasibility of producing a wide range of goods, as economic of scale that can be realized in large market favor the introduction of heavy industries even at lower level of income. Hence, this helps the manufacturing exporters to acquire cost advantage which in turn adds a competitive power to supply in the international markets.

DIND: is the home economy infrastructural development which includes energy, road constructions, transport and communications. Infrastructures development which currently becomes one of the most important variables that computed by researchers in affecting almost all aspects of economy components and especially for those developing countries like Ethiopia its development is very indispensable. Infrastructure (road, power, communication, water etc) development, which is the key determinant factor for the flourishing of any industry especially export sector, proxied by the ratio of public investment on energy, road construction transportation and communication to GDP (DIND). Therefore, expanding infrastructure density

of various types with an acceptable level of quality or the increase in public investment in infrastructure to GDP ratio (*DIND)* in Ethiopia will have positive impact on export growth.

The disturbance term, μ_t, is an integral part of the study since it acts as a cover all terms for parts of the study that will not be fully known about and explicitly modeled. Meaning it serves as consideration of omitted variables, measurement of errors and to account for purely randomness in the human behavior.

Real Wage and Value added per person: The model uses real wage rate by deflating nominal wage rate to consumer price index and labor productivity (VAPE) as separate explanatory variables. A decline in real wage or an increase in productivity leads to a decline in unit labor costs, and thus can lead to an increase in employment as long as labor demand is sensitive to labor costs, as the neo-classical economics assume. However, if labor demand is mostly responding to the demand for the output of the sector rather than labor costs, there will be no significant change in employment in response to changes in either wages or productivity. Moreover, the effect of labor productivity is two sided: On the one hand, higher productivity for a given wage level leads to lower labor costs, but on the other hand, it also leads to labor saving, and a downward shift of the labor demand curve for a given level of output. In a Kaldorian framework, if an increase of labor productivity is not matched by an increase in effective demand, then it may have a negative impact on employment. Within the context of neo-classical structural adjustment programs, this aspect is usually dismissed as a short-run phenomenon, and the stimulating effect of productivity on the competitiveness of the sector is expected to promote both production and employment in the long run.

SKILL: refers to skill of the workers which is proxied by professional (such as technicians, researchers, draftsman, engineers, chemists, architects etc. and non-professional based on the definition given by CSA. If the employees are skilled they have a good chance to be employed specially in manufacturing industry and hence resulted an increase in demand for labor. For instance, in the 20th century, physical capital and skill have been shown to be relative complements so that capital deepening has increased the demand for skilled relative to unskilled labor (Griliches, 1969).

Real Lending interest Rate (RIR): Real interest rate is the interest rate which is calculated according to the Fisher equation, i.e. by subtracting the inflation rate from the lending nominal interest rate. It is expected to show the cost of capital to investment. A real increment of the

lending interest rate on manufacturers is unfavorable to employment by decreasing the level exports since it increase cost of production and hence, the home exports become expensive to the rest of the world, ceteris paribus. Inversely, a real reduction of the lending interest rate stimulates exports, and thus favors employments. Therefore, it may have negative or positive impact on labor employment of LMSMI depending on the market interaction between the manufactures and the financiers.

Efficiency (EFF): Efficiency is crucial in order to improve the competitiveness of the industry since it helps the manufacturers to produce greater output from a given input. Efficiency is measured by the ratio of value added to the gross value of production. When the manufacturing industries are efficient, the less cost incurred to make products and better profit they earn and hence manufactures demanded efficient employees to reduce wastage and time of productions. Therefore, the expected impact of efficiency on employment of LMSMI is positive.

To sum up , based on economic theories the first three variables(RGDPPMTP and REER) in the model considered as external(Demand side) factors while the other three are internal(Supply Side) determinates of export performance. In general, determining the sign of each coefficient of the independent variable will be the central focus of the study to identify their significance on the dependent variable.

4.4 Econometric Approach of the Study

This study employed autoregressive distributed lag (ARDL) approach proposed by Pesaran et al. (2001). Recent research in social sciences has indicated that the ARDL approach to co-integration is more superior and has many advantages to other conventional co-integration approaches such as Engle and Granger (1987), Johansen and Juselius (1990) and Johansen, (1991, 1992) (Mohammada and Khalil, 2008). First advantage of ARDL approach is that if variables are integrated at *I(0)*, *I(1)* or *I(0) /I(1).* Secondly, ARDL is more dynamic and provides better results for small sample sizes than traditional techniques in the literature. Finally, with the ARDL it is possible that different variables have differing optimal number of lags. Therefore, this paper applied a bound test procedure by modeling the long equation as a single model as:

$$\mathbf{LEXP_t = \theta_o + \gamma t + \beta_2 EXP_{t-i} + \sum_{t=1}^{P} \beta_i Z_{t-i} + \mu_t}$$

Where Z_t = (log of the explanatory variables) with θ_0 that representing an intercept (drift) and γ is denoting a trend coefficient while Z_t is vector of independent variables, B_i are coefficients and μ_t is a white noise error terms.

Generally, the ARDL framework addresses three basic questions. Firstly, is there any long run relation among variables? This equation will be addressed by:

$$\Delta EXP_t = \theta_0 + \sum_{i=1}^{p_1} \beta_{1,i} \Delta LEXP_{t-i} + \sum_{i=1}^{p_2} \beta_{2,i} \Delta LRGDPPET_{t-i} + \sum_{i=1}^{p_3} \beta_{3,i} \Delta LDIND_{t-i} + \sum_{i=1}^{p_4} \beta_{4,i} \Delta LREER_{t-i} + \sum_{i=1}^{p_5} \beta_{5,i} \Delta LRGDPPAF_{t-i} + \sum_{i=1}^{p_6} \beta_{6,i} \Delta LRGDPPEU_{t-i} + \sum_{i=1}^{p_7} \beta_{7,i} \Delta LRGDPPUS_{t-i} + \sum_{i=1}^{p_8} \beta_{8,i} \Delta LRGDPPFE_{t-i} + \delta_1 LEXP_{t-i} + \delta_2 LRGDPPET_{t-i} + \delta_3 LDIND_{t-i} + \delta_4 LREER_{t-i} + \delta_5 LRGDPPAF_{t-i} + \delta_6 LRGDPPEU_{t-i} + \delta_7 LRGDPPUS_{t-i} + \delta_8 LRGDPPFE_{t-i} + \mu_t ---------(6)$$

In the above equations β_i (i = 1, 2 − − − 8) are the short run coefficients while δ_i (i = 1, 2------- 8) are the long run coefficients and P_i (i = 1, 2 − − − 6) are number of lags used for each variable like LEXP, LREER, LDIND and LRGDPPMTP respectively. In order to determine the lag structures for each variable Akaike information criteria is used. The null hypothesis of the equation will be:

$\mathbf{H_0}$ = δ_1 = δ_2 = − − −= δ_8 = O and implies that all variables do not have any long run relationships. On the other hand, $\mathbf{H_A}$ = δ_1 = δ_2 = − − −= δ_6 ≠ O indicates the existence of long run relationships among the variables.

Secondly, if there is the existence of co integration among the variables, then the long run equation based on the level of the variables estimated by:

$$LEXP_t = \theta_0 + \sum_{i=1}^{p_1} \delta_{1,i} LEXP_{t-i} + \sum_{i=1}^{p_2} \delta_{2,i} LRGDPPET_{t-i} + \sum_{i=1}^{p_3} \delta_{3,i} LDIND_{t-i} + \sum_{i=1}^{p_4} \delta_{4,i} LREER_{t-i} + \sum_{i=1}^{p_5} \delta_{5,i} LRGDPPAF_{t-i} + \sum_{i=1}^{p_6} \delta_{6,i} LRGDPPEU_{t-i} + \sum_{i=1}^{p_7} \delta_{7,i} LRGDPPUS_{t-i} + \sum_{i=1}^{p_8} \delta_{8,i} LRGDPPFE_{t-i} + \mu_t ---------(7)$$

Where **δ'**S are long run coefficient of market size of Ethiopia and major trading partners, real exchange rate and infrastructural development. Finally, the short run dynamics can be captured by the following equation which consists of only difference term and Error Correction Term (ECT):

$$\Delta EXP_t = \theta_0 + \sum_{i=1}^{p_1} \beta_{1,i} \Delta LEXP_{t-i} + \sum_{i=1}^{p_2} \beta_{2,i} \Delta LRGDPPET_{t-i} + \sum_{i=1}^{p_3} \beta_{3,i} \Delta LDIND_{t-i} + \sum_{i=1}^{p_4} \beta_{4,i} \Delta LREER_{t-i} + \sum_{i=1}^{p_5} \beta_{5,i} \Delta LRGDPPAF_{t-i} + \sum_{i=1}^{p_6} \beta_{6,i} \Delta LRGDPPEU_{t-i} + \sum_{i=1}^{p_7} \beta_{7,i} \Delta LRGDPPUS_{t-i} + \sum_{i=1}^{p_8} \beta_{8,i} \Delta LRGDPPFE_{t-i} + \emptyset ECT_{t-i} + \mu_t ----(8)$$

Where **β**'s are short coefficients of the variables respectively and $\emptyset$ is an adjustment coefficient that implies the speed and directions of changes to wards equilibrium in the long run.

A similar procedure has been used in the second model: employment determinant of large and medium scale sectors. Hence, the long run equation is based on the level of the variables;

$$\boldsymbol{LEMP_t = \alpha_0 + \sum_{t=1}^{K_1} \alpha_{1,i} LEMP_{t-i} + \sum_{t=1}^{K_2} \alpha_{2,i} LRWAG_{t-i} + \sum_{t=1}^{K_3} \alpha_{3,i} LSKILL_{t-i} + \sum_{t=1}^{K_4} \alpha_{4,i} LEXP_{t-i} + \sum_{t=1}^{K_5} \alpha_{5,i} LVAPE_{t-i} + \sum_{t=1}^{K_6} \alpha_{6,i} LEFF_{t-i} + \sum_{t=1}^{K_7} \alpha_{7,i} LRIR_{t-i} + \varepsilon_t} \quad (9)$$

Where $\boldsymbol{\alpha_0}$ is an intercept, $\mathbf{k_i}$ = (1, 2 − − − 7) is number of lags used for each variables like RWAG, SKILL, EXP, VAPE, EFF and RIR and ε is an error term.

The short run dynamics is given by:

$$\boldsymbol{\Delta LEMP_t = \alpha_0 + \sum_{t=1}^{K_1} \alpha_{1,i} \Delta LEMP_{t-i} + \sum_{t=1}^{K_2} \alpha_{2,i} \Delta LRWAG_{t-i} + \sum_{t=1}^{K_3} \alpha_{3,i} \Delta LSKILL_{t-i} + \sum_{t=1}^{K_4} \alpha_{4,i} \Delta LEXP_{t-i} + \sum_{t=1}^{K_5} \alpha_{5,i} \Delta LVAPE_{t-i} + \sum_{t=1}^{K_6} \alpha_{6,i} \Delta LEFF_{t-i} + \sum_{t=1}^{K_7} \alpha_{7,i} \Delta LRIR_{t-i} + \tau ECT_{t-i} + \varepsilon_t} \quad (10)$$

4.5 Some Econometric Estimation Issues

4.5.1 Stationary Test

There are several preliminary steps when using time series data in econometrics analyses. Stationarity test used to see whether the observed data are stationary or not. As a consequence of the use of time series data, the stationarity test helps to see existence of long-run relationship among economic variables. In general, testing for stationarity of our time series ensures that the variables used in the regressions are not subject to spurious.

4.5.1.1 Testing for Unit Roots

Having established the statistical properties of the data series, the next step is to determine whether the data series possess unit roots. A most widely used approach to test for stationarity is unit root test. There are many tests used to determine stationarity. In this study, the stationary of the variables is tested by using Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test.

Augmented Dickey-Fuller (ADF) test is often employed to determine degree of integration of variables and how many times should a variable be differenced to attain stationary (Dickey and Fuller, 1979). Technically, procedures in the ADF test is based on MacKinnon (1991) critical values instead of t-test; the t-ratio is compared with critical value of t-statistics in ADF table in

order to determine the presence or absence of unit roots. If the hypothesis is accepted, the variable was not stationary, and is necessary to test the degree of integration. Test the degree of integration is intended to look at the degree or order difference to how the observed data be stationary. If the series is stationary without differencing, then it is integrated of order zero, I (0) or stationary at level. A series is said to be integrated of order one, or I (1), if it becomes stationary after differencing once and of order two, I (2) if the series becomes stationary after differencing twice.

Phillips-Perron (PP) test is a more robust to serial correlation and time dependent heteroskedasticity and is an improvement over the ADF test with respect to finite sample properties (Deme, 2002). Technically, the PP test does not add lagged difference terms to account for a potential serial correlation in the error terms; rather it uses non-parametric statistical methods.

An important issue is whether the test should be conducted with trend and drifts terms, with just a drift term, or with no trend and no drift. The matter is crucial as erroneous inclusion of a term in the equation, or its wrongful omission may bias the test result. Thus, the ADF test is performed in the first instance with a drift term. If the null hypothesis of the presence of unit roots is rejected, it is concluded that the variable is stationary. Where ADF fails to reject the null, the PP test is conducted for confirmation. As a non-parametric test, the PP test is known to produce superior results than the parametric ADF test as it has more power. The PP test is also known to be better in the presence of regime shifts and small samples. These problems are frequently encountered with African macroeconomic data.

4.5.2 Lag Length Selection Criteria

In this study the lag structure of the Au*tor*egressive distributed lag model specification is determined by Akakie Information Criteria (AIC) since it controls the problems of autocorrelation and it is also advantageous for small sample size.

4.5.3 Diagnostic Test and Model Stability test

In time series date beyond the bound test procedures it is very mandatory to make a diagnostic and model stability tests in order to confirm the robustness of the model under the study. Therefore, this study employed the serial correlation test, functionality form test, normality test and heteroskedasticity test or the form one while the cumulative sum (CUMSUM), the cumulative sum of squares (CUMSUMSQ) of the recursive residual test, Chow test and Quandt-Andrews unknown break for the later one.

The Breusch-Godfrey serial correlation LM test is a test for autocorrelation in a regression model. It used residuals from the model being considered in a regression analysis and a test statistic is derived from these. In particular, it test for the presences of the serial dependence that has not been included in a proposed model structure and which, if present, would mean that incorrect conclusion would be drawn from other test, or that sub optimal estimates of the model parameters are obtained if it is not taken. The test is more general than the Durbin-Watson (or Durbin's h statistics) which is only valid for non-stochastic regressors and testing the probability of a first order autoregressive model for the regression errors. The Breusch-Godfrey test has none of these restrictions and is statistically more powerful than the DW test.

Functionality form test is employed for this study based on Ramsey's RESET test using the square of the fitted values for both models. The RESET test is a test of misspecification, as in the DW test, that may indicates that there is some form of misspecification but does not give any indications of what the correct specifications should be. The regressors are estimated when a nonlinear specification with squared fitted values obtained from a liner regression. Meaning, RESET adds polynomials in the OLS fitted values to the linear function to detect general kinds of the functional form misspecifications. The study test for the functional form with the LM test and F-test where the null hypothesis is the correct specification is linear (Accept the RESET test) while the alternative hypothesis is the correct specification is non-linear (reject the RESET test).

The normality test (Jarque-Bera) under the study conducted based on a test of Skewness and Kurtosis of residuals. The JB test helps to check whether the residuals are normally distributed or not. The null hypothesis is that the joint of the Skewness being zero and the excess Kurtosis being zero ($H_{0:}$ Normality distributed) while the alternative is non-normal distribution (H_1). Samples from the normal distributions have an expected skewness of zero and an excess Kurtosis of zero (which is same as kurtosis is three). And, basically it is always better to accept the null hypothesis of the normal distributions at 10% probability value that is the probability value should be close to one.

In time series regression applications, heteroskedasticity often receives little, if any, attention: the problem of serially correlated errors is usually more pressing. Nevertheless, it is useful to briefly cover some of the issues that arise in applying tests and corrections for heteroskedasticity

in time series regressions and more importantly for small sample size data (Wooldridge, p-398). In time series data, heteroskedasticity is more often the result of interactions between model predictors and omitted variables, and so is another sign of a fundamental misspecification. OLS estimates in the presence of heteroskedasticity exhibit virtually identical problems to those associated with autocorrelation; they are unbiased, but no longer have minimum variance among unbiased estimators, and standard formulas for estimator variance become biased. Hence, heteroskedasticity test employed based on the regression of squared residuals on squared fitted values to avoid misspecifications and check the robustness of the models. The study used both the LM test and F-test where the null hypothesis is no heteroskedasticity while the alternatives one is there is heteroskedasticity.

CHAPTER FIVE: EMPIRICAL FINDINGS AND ANALYSIS

5.1 Time Series Properties of the Data

5.1.1 Graphical Scrutiny

Before one pursues formal tests for stationarity by checking unit root in the variables using Agumented Dicky Fuller test or other tests, it is always advisable to plot the time series under study because visual plot of the data is the first step in the analysis of any time series. Such a plot gives an initial clue about the likely nature of the time series. All the variables; employment, real wage rate, export, value added per person engaged ,efficiency, market size of Ethiopia, Africa, Europe, USA, Far East, real effective exchange rate, and domestic infrastructure are measured as logarithms while the real lending interest rate is without logarithms and all these variables are drawn graphically(see appendix 6A and 6B).

The graph shows most of the variables has a time trend (for example; employment, real wage, skill, export , value added per person engaged, market size of the regions and domestic infrastructure development while only three variables (real lending interest rate, real effective exchange rate and efficiency) have a fluctuating nature. Thus, this trending feature may be a signal to include a time trend in the long run equation for the employment. This suggests that the mean of all the above variables might be changing which perhaps implies they are not stationary at level. Such an initiative feel is important starting point for more formal tests of stationarity.

5.1.2 Unit Root Tests

Most economic variables that exhibit strong trends such as market size of the regions, domestic infrastructure development, export, exchange rate and employment in our case, are not stationary and thus it's indispensable to correct such macro variable behavior, if not estimation using such variables would led to a spurious regression (inconsistent and unreliable results) or the standard OLS cannot be applied since there might be a spurious regression which affects the foresting performance. Though the ARDL approach to co-integration does not require the pre-testing of the variables included in the model for unit root, the computed F-statistics Provided by Pesaran *et al* (2001) are no more valid in the presence of I(2) or beyond variables because they are based on the assumption that the variables are either I(0) or I(1) or their combinations. It is therefore, important to carry out the implementation of the unit root tests to ensure that none of the variables is integrated of order 2 or beyond (Sheriff and Amoako, 2014). Accordgily, the study

uses two common tests, namely the standard Augmented Dickey-Fuller (ADF, 1979, 1981) and the Phillips-Perron (1988) unit root tests under two alternatives hypothesis.

The time series behavior of each series using the ADF test is presented in table (5.1 and 5.2). The ADF test results shows that all the critical values are less than the ADF test statistics; therefore we can reject the null hypothesis of having a unit root problem. The computed ADF test shown in the table 5.1 and PP test in the appendix 6 which are obtained from E-views 9 indicates that some variables are integrated of order zero, I(0), namely employment, lending interest rate & efficiency and some are integrated of order one, I(1), such as real wage rate, skill, export, value added per employees, market size of the regions, real effective exchange rate, and domestic infrastructure development. Besides, both tests confirmed that none of the variable is integrated of order two, I (2).Therefore, the ARDL model of co-integration test can be used for this study.

The second unit root test done based on the Phillips- Perron approach and the results shown on the appendix 7A and 7B are similar to the ADF test where some variables are stationary at level and some others at first difference.

To sum up, both the ADF and PP test results or stationary test indicates that all variables under the study are either I (0) or I (1) and based on these two tests none of the variables is integrated of order two. Once the nature of the variables determined and all variables included in the model are qualifying the primary required assumption whenever using the ARDL approaches for co- integration we can proceed to the next step of testing for the existence of co-integration using the F-statistic and comparing to the Pesaran et al. (2001) critical values to determine whether there is long run relationship or not.

Table 5.1: Unit Root Test Result Using Augmented Dickey-Fuller Test for Export Model

Variables	Test Statistics under different assumptions			Order of integration
	Intercept	Trend and intercept	No trend and no intercept	
LEXP	0.303237	-1.615462	2.175486	
D(LEXP)	-6.152130	-6.568305*	-5.667797	I(1)
LRGDPPET	-1.949526	-0.122418	2.380776	
D(LRGDPPET)	-4.133351	-5.497796*	-3.846490	I(1)
LREER	-1.148475	-1.396678	-0.607541	
D(LREER)	-4.650001	-4.592327*	-4.692139	I(1)
LDIND	0.314337	-1.456780	3.409763	
D(LDIND)	-6.265565*	-6.418577	-2.505969	I(1)
LRGDPPAF	1.949576	-0.122418	2.380776	
D(LRGDPPAF)	-4.133351	-5.497796*	-3.846490	I(1)
LRGDPPEU	-0.043307	-2.607273	1.943820	
D(LRGDPPEU)	-3.293904**	-3.330498	-2.549645	I(1)
LRGDPPUS	-0.083210	-2.614454	1.933149	
D(LRGDPPUS)	-3.154746**	-3.185360	-2.397251	I(1)
LRGDPPFE	-1.658248	-0.566992	2.039187	
D(LRGDPPFE)	-3.804383	4.320047*	-3.064009	I(1)

Note: *D refers the variable is differenced once. Note: MacKinnon (1996) one-sided Critical values for rejection of a unit root are used here.* shows significant at 1% and ** significance at 5%*

Table 5.2: Unit Root Test Result Using Augmented Dickey-Fuller Test for Employment model

Variables	Test Statistics under different assumptions			Order of integration
	Intercept	Trend and intercept	No trend and no intercept	
LEMP	6.080941**	4.225353	0.666366	
D(LEMP)	2.011422	-1.357233	2.860236	I(0)
LRWAG	-0.167863	-1.736966	1.297207	
D(LRWAG)	-5.831484**	-5.999876	-5.630744	I(1)
LSKILL	-1.672602	-2.789974	2.422270	
D(LSKILL)	-6.469154**	-6.383175	-5.449179	I(1)
LEXP	0.303237	-1.615462	2.175486	
D(LEXP)	-6.152129	-6.568304*	-5.667796	I(1)
RIR	-3.924386	-4.051692*	-3.904818	
D(RIR)	-8.530184	-8.444073	-8.654752	I(0)
LEFF	-3.891671	-4.043591*	0.391893	
D(LEFF)	-8.260581	-8.147842	-8.358542	I(0)
LVAPE	0.395531	-2.406462	2.122221	
D(LVAPE)	-4.626945*	-4.718497	-4.241914	I(1)

Note: *D refers the variable is differenced once. Note: MacKinnon (1996) one-sided Critical values for rejection of a unit root are used here.* shows significant at 1% and ** significance at 5%*

5.2 Econometric Analysis of the Export model

5.2.1 Bound testing approach

The test for the long run relationships among the variables is conducted by the ordinary least squares procedure using the F-statistics and the recommended optimal lag length for the ARDL model is maximum of two lags. Due to its superiority for small sample size, the study use Akaike information criterion to determine the optimal lag length.

The F-statistic has a non-standard distribution which depends up on: (i) whether variables are included in the ARDL model are I (1) or I (0), (ii) the number of regressors and (iii) whether theARDL model contains an intercept, and/or a trend. The computed F-statistic will be compared to the critical values bounds of the Pesaran et al. (2001). The whole sets of the critical

values provided critical value bounds for all classifications of the regressors into purely I(1),Purely I(0) or mutually co-integrated.

If the F-statistic is less than the lower bound of test, then there is no co-integration (no long run relationship) among the variables while if the F-statistic is greater than the upper bound we can conclude that there is a long run relationship among the variables and these are the two extreme cases in which we can conclude with confidence about the co-integration. However, if the F-statistic falls between the lower, I (0) and upper bound, I (1), critical values its inconclusive meaning we cannot conclude anything about the long run relationships among the variables. In such events, it's important to the check the error correction term in the short run model and if the ECT is negative and significant, we can conclude there exists long run relationships among the variables. Or, it's possible to undertake a unit root test for the error term (if the error term is stationary at level there is long run relationships among the variables.

The result indicates as shown on table 5.3 below, the calculated F-statistics is greater than the upper bound of the Pesaran et al. (2001) critical bound at 1% level of significance, which means a conclusive decision can be reached. Table 5.3 below shows the computed F-statistics for the main target of study is 4.60 that fall above the upper bound critical value which is 4.26 and the lower bound critical value which is 2.96 at 1% level of significance. Therefore, the null hypothesis of no cointegration between export of LMSMI products and its fundamentals must be rejected (Co-integration exists).

Table 5.3: F-tests on bounds co-integration procedure

Variables	AIC Lags	F-statistic	Prob.	Decisions
Lexp | lrgdppet,lreer,ldind,lrgdppaf,lrgdppeu,lrgdppus,rgdppfe	2	4.60	0.004	Cointegrated*
Lrgdpet | lexp,lreer,ldind,lrgdppaf,lrgdppeu,lrgdppus,rgdppfe	2	1.87	0.083	No cointegration
Lreer | lrgdppet,lexp,ldind,lrgdppaf,lrgdppeu,lrgdppus, rgdppfe	2	8.22	0.000	Cointegrated*
Ldind | lrgdppet,lreer,lexp,lrgdppaf,lrgdppeu,lrgdppus,rgdppfe	2	1.93	0.009	No cointegration
Lrgdppaf | lrgdppet,lreer,ldind,lexp,lrgdppeu,lrgdppus,rgdppfe	2	2.23	0.000	Inconclusive***
Lrgdppeu | lrgdppet,lreer,ldind,lrgdppaf,lexp,lrgdppu,rgdppf	2	2.20	0.000	Inconclusive***
Lrgdppus | lrgdppet,lreer,ldind,lrgdppa,lrgdppeu,lexp,rgdppfe	2	2.06	0.000	Inconclusive***
rgdppfe | lrgdppet,lreer,ldind,lrgdppaf,lrgdppeu, lrgdppus ,lexp,	2	6.38	0.000	Cointegrated*

Note: shows cointegration at 1% and ***at 10% significance. In each functions constant and K=7 plus the lower and upper bound are based on Pesaran et al. critical values of Eviews9*

5.2.2 Long run parameter representation of the ARDL Model

Following the determination of the existence the long run relationships, the next step will be resolving of the long run model. The long run model estimated using Microfit 4.1 based on the Akaike information criterion using maximum of two lag length. The estimation result indicates ARDL (0,1,0, 1,2,1,2,0) selected based on AIC and the results are summarized in table 5.5.

Table 5.4 and table 5.5 shows the long run estimate for the estimated ARDL (0, 1, 0, 1, 2, 1, 2,0) model using the ordinary least square technique. Both below long run estimate results shows that, citrus paribus, the domestic infrastructure development, the economy market size of both the

home country and Europe have a significant positive impacts on the export performance of large and medium scale manufacturing sectors while real effective exchange rate and the economy market size of Africa remain to have significant negative impact on the export of large and medium scale manufacturing sector. In the long run, the economy market size of the united states of America and Far East have insignificant impact on the on the export of large and medium scale manufacturing sector.

Table 5.4: Autoregressive Distributed Lag Estimates (Full Model)

ARDL (0, 1, 0, 1, 2, 1, 2, 0) selected based on Akaike Information Criterion

Dependent Variable LEXP			
Regressor	**Coefficients**	**Standard Errors**	**T-Ratio(Prob.)**
LRGDPPET	2.2148	0.91372	2.4240[0.025]
LDIND	0.50404	0 .17909	2.8145[0.011]
LREER	-0.52174	0 .27508	-1.8967[0.073]
LRGDPPAF(-2)	7.1324	2.2596	3.1564[0.005]
LRGDPPEU	5.5301	4.0325	1.3714[0.186]
LRGDPPUS(-2)	-7.4002	2.1911	-3.3774[0.003]
LRGDPPFE	1.5603	11.3049	0.1380[0.892]

R-Squared 0.98263 R-Bar-Squared 0 . 97074 S.E. of Regression 0.19382

F-stat. F (13, 19) 82.6588[.000] Residual Sum of Squares 0.71376

Mean of Dependent Variable 6 . 1 3 6 1 S.D. of Dependent Variable 1.1330

Equation Log-likelihood 16.4313 Akaike Info. Criterion 2 . 4 3 1 3

Schwarz Bayesian Criterion -8.0443 DW-statistic 2.2520

Note: All variables are in log forms, and Results produced using Microfit 4.1

Table 5.5: Estimated Long Run Coefficients using the ARDL Approach

ARDL (0, 1, 0, 1, 2, 1, 2, 0) selected based on Akaike Information Criterion

Dependent variable is LNEXP			
33 observations used for estimation from 1981 to 2013			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LRGDPPET	3.4056	0.68213	4.9925[0.000]
LDIND	0.50404	0.17909	2.8145[0.011]
LREER	-0.96156	0.30682	-3.1340[0.005]
LRGDPPAF	-5.0877	1.8777	-2.7095[0.014]
LRGDPPEU	11.0393	3.8069	2.8999[0.009]
LRGDPPUS	-6.3316	3.7971	-1.6675[0.112]
LRGDPPFE	1.5603	11.3049	0.13802[0.892]

The main empirical finding of this study is that, the economy market size of the home country in LMSMI having a very high positive significant impact on the export of LMSMI. That is one percentage increase in the market size of Ethiopia will lead to more 3.4 percentage increase in the export of large and medium scale manufacturing sector. Theoretically, this result is realistic since an increase in the income of manufacturer's gives an additional potential to easily access technology, machineries, human power, etc which in turn helps to boost the competitive capacity of the industry. In short additional investment capacity, in order to increase the exporting of manufactured items (For instance, Economic scale theory). Robert Vishny et al, (1989) have found similar result for the size of domestic market having a positive on the export performance of large and medium scale manufacturing sector.

The long run impact of real effective exchange rate on the export performance of large and medium scale manufacturing sector is found negative and statistically significant, which means that a one percentage increase (e.g Appreciate in birr) in real effective exchange rate will decrease the export of large and medium scale manufacturing sector items by 0.96 percent in the long run. This high estimated coefficient suggests that the exports of large and medium scale manufacturing sector items are highly sensitive to the external shock. Beyond its negative effect on export, significant real appreciation could thus create major problems for macroeconomic management. The result goes parallel with the Marshal-Lerner condition and Mundel-Fleming model and also confirmed the findings of Edwards and Alves (2005), Onakoya, et al. (2012) and Nega (2013) regarding of the negative relationships between real effective exchange rate and export.

The effect of the domestic infrastructure development is positively significant in determining the export of large and medium scale manufacturing sector products. That is, one percentage increase in domestic infrastructure development of Ethiopia will lead to more 0.50 percentage increase in the export of large and medium scale manufacturing sector. The result is expected since Ethiopian government spending huge amount of money in each fiscal year for physical public infrastructure development. For instance, the total physical public infrastructure investments (on transport, road construction, energy and telecommunication) increased from 5.82 percent in 1990/00 to 10.65 during 2009/10. Similarly, the economy market size of Europe in particular our main trading partners have positively significant in affecting of large and medium scale manufacturing sector exports that is a one percentage increase in market size of Europe will leads to 11.03 percent increment in exporting of Ethiopian large and medium scale manufacturing sector products. This high coefficient appears since Europe is a principal continent where Ethiopian exports are reached. The result is similar with the findings of Mulalem (ND) and Tofik (2004).

However, unlikely to the positive effect of European market size and the theoretical expectations, the economy market size growth of both United States of America and Far East found to have an insignificant impact on exports of LMSMI products in the long run. This impact may arise from the export structure of Ethiopia. Ethiopia is exporting low manufacturing production base items with weak technological development which are income and price inelastic which mainly indicates that export supply is not directly influenced by foreign demand factors. The result is similar with the findings of Sisay (2010) and Belayneh et al.(2011).

Finally, the effect of market growth of Africa on Ethiopian LMSMI products is negative and significant at 1%. The negative association of Ethiopian exports & African market size of major trading partners might show that Ethiopia's manufacturing exports are may be inferior exports to African customers. Furthermore, the exported items of both Ethiopian and major trading partners from Africa are almost similar (for instance commonly exported items based on WB are textiles, garments and food processing items).These resulted in:

- Low trading activity between both nations (low share)
- High elasticity of substitutions between competing products of both nations
- Lower income elasticity of demand

Therefore, the above features of Ethiopian LMSMI exports are the tolerable reasons for this trifling relationship between the market growth of Africa as a trading partner and real exports of Ethiopian LMSMI commodities.

5.2.3 Short Run Representations of ARDL model Bound Testing Approach

The next step following the sympathy of long run co-integration thorough F-statistics and estimation of the long run coefficients will be the estimation of error correction representation to capture the short run dynamics of the model consistently with the long-run relationship. Accordingly, the ECM model is estimated using OLS in an ARDL approach and results are summarized in table 5.6 below.

Table 5.6: Error Correction Representation for the Selected ARDL, ARDL (0,1,0,1,2,1,2,0) selected based on Akaike Information Criterion

Dependent variable is LEXP				
33 observations used for estimation from 1981 to 2013				
Regressor	Coefficient	Standard Error	T-Ratio	Probability
dLRGDPPET	2.2148	0 .91372	2.4240	[0.024]
dLDIND	0.50404	0.17909	0.17909	[0.010]
dLREER	-0.52174	0.27508	-1.8967	[0.070]
dLRGDPPAF	-5.6031	2.3879	-2.3465	[0.028]
dLRGDPPEU	5.5093	3.8241	1.4407	[0.163]
dLRGDPPUS	7.4002	2.1911	3.3774	[0.003]
dRGDPPFE	1.5603	11.3049	0.13802	[0.891]
ECM(-1)	-0.7959	0.31251	-2.5467	[0.021]
R-Squared	0.83337	R-Bar-Squared	0.71935	
S.E. of Regression	0.71935	F-stat. F(9, 23)	10.5580[.000]	
Mean of Dependent Variable	0.11965	S.D. of Dependent Variable	0.36586	
Residual Sum of Squares	0.71376	Equation Log-likelihood	16.4313	
Akaike Info. Criterion	-1.8382	Schwarz Bayesian Criterion	-8.0443	
DW-statistic	2.2502			
ECM = LEXP -3.4056*LRGDPET -0.50404*LDIND + 0.96156*LREER + 5.0877*LRGDPAF -11.0393*LRGDPEU + 6.3316*LRGDPUS -1.5603*LRGDPFE				

The results in table 5.6 show that the market size of home economy and United States of America, real effect exchange rate, domestic infrastructure development and the market size of Africa have

significant impact on the export of large and medium scale manufacturing industry of Ethiopia in the short run while the market size of Europe and Far Fast have no an impact during the short run.

The effect of the growth of the market size of home economy is not only significant in the long run but also in the short run at 5% level of significance. That is one percent increase in the market size of home economy leads to increase the export of large and medium manufactured products by 2.21 percent in the short run. Likewise, the real effect exchange rate has significant impact on the export of LMSMI products not only in long run but also in the short run (a one percent reduction in the real effect exchange rate results a 0.52 percent increment in exporting of LMSMI products).

Unlike to the long run impact of market size growth of US, the short run effect is positively significant, that is, one percent increase in the market size of US leads to 7.40 percent increase in export of large and medium manufactured products. This result can be supported by the African growth and opportunity act (AGOA) where the US government offers short period free market incentives for Africa including Ethiopia. The legislation allowed free export of products such as textiles, meat products, leather products, manufactured products and vegetables products in US market and such opportunity helps to reduce cost for exporters which serves as an injection for boosting export capacity of LMSMI at least in short period.

The market size of both the Far East and Europe has insignificant impact in determining the export of large and medium manufactured products in short run. This may be due to the fact that our products are inferior to the customers of Far East and Europe plus the exports of LMSMI are income and price inelastic.

Though the return of investment on public infrastructure development seen to be observed in long period of time, for an economy like Ethiopia where infrastructure development at low level a single progress on public infrastructure has a significant role plus the production of LMSMI are dependent on domestic sources. Therefore, the public infrastructure development has an important role not only in the long run but also in the short run.

Above all, the coefficient of the error correction term that captures the speed of adjustment towards the long run equilibrium is found with the correct sign and magnitude. The speed of adjustment is -0.7959, which implies that around 79% deviations from long-term equilibrium is

adjusted every year and the rest 21% in the coming year. This shows it takes the error correction term around one and half year to correct any deviation from the equilibrium. This also indicates once the disequilibria happened, it will take more than one year to adjust itself towards the long run equilibrium or in other words it took less a year and half, $\frac{1}{0.7959} = \mathbf{1.2564}$, eliminate the disequilibrium which is to make a full adjustment towards its long-run equilibrium.

5.2.4 Diagnostic Test

Different diagnostic tests are undertaken to indemnify the estimated results and inferences being vigorous. These tests are Serial correlation, Functional form test, Normality test and Heteroskedasticity tests (see appendix 9). The LM test indicates that the residuals of the estimated error correction model do not suffer from autocorrelation. So, we accept the null hypothesis of no serial correlation. Ramsey's RESET test showed that the model does not suffer from any misspecification problems. Furthermore, failing to reject the null in Ramsey reset test also further confirms that our model did not suffer from omitted variable bias. The Jarque-Bera test of normality fails to reject the null hypothesis of normal distribution at the 5% significance level. Moreover, since normality is an asymptotic or large sample property, it may be expected that the residual normality could asymptotically be improved if the sample size could be increased. Unfortunately, the sample size could not be increased because of the export data. Finally, heteroskedasticity test performed and the test fails to reject the null hypothesis of no heteroskedasticity. This result indicates that the residuals of the model are found to be homoscedastic.

5.2.5 Model Stability

In order to reduce the forecasting errors and unreliability of the model (avoiding misleading inferences), the study employed the two most commonly used stability tests for the presence of a structural break namely chow test and Quandt-Andrews unknown break point test. Understanding of break point is central for accurate evaluation of any program intended to bring about structural changes; such as the tax reforms, banking sector reforms and regime shifts etc. (Lulseged 2011)

Generally, the year 1992 and 2003 are the most suitable candidates for structural break in Ethiopia. The economic reason for the first candidate is that the country experienced a change in regime from the most command economy to the market oriented transitional government which took different reform measures such as exchange rate policy, monetary policy, interest rate

policy, fiscal policy, privatization, trade liberalization, investment law etc. The later year also a period where the export share of different commodities starts to change because of export diversification and the demand of some of the primary commodities. Table 5.7A and 5.7B indicates the results of the structural break test based on the chow test and Quandt-Andrews unknown break test respectively.

Table 5.7A: Chow Test

Chow break point test : 1992		Ho: No break at specified break points	
Varying Regressors: All equation Variables		Equation Sample: 1982 2013	
F-statistic	0.439430	Prob. F(9,14)	0.8913
Log likelihood ratio	7.961726	Prob. Chi-Square(9)	0.5380
Wald Statistic	3.954868	Prob. Chi-Square(9)	0.9144

Table 5.7B: Chow Test

Chow break point test : 2003		Ho: No break at specified break points	
Varying Regressors: All equation Variables		Equation Sample: 1982 2013	
F-statistic	1.290538	Prob. F(9,14)	0.3226
Log likelihood ratio	19.33167	Prob. Chi-Square(9)	0.0225
Wald Statistic	11.61484	Prob. Chi-Square(9)	0.2359

The results shows that for both years, 1992 and 2003, we fall to reject the null hypothesis of no breaks points meaning there is no break for the export of large and medium scale manufacturing industry commodities. And, these assure that the model under the study is stable since the mean and the variance of the variables are time invariant.

Table 5.8: Quandt-Andrews test

Varying regressors: All equation variables		Equation Sample: 1982 2013	
Ho : No breakpoints within 45% trimmed data Test Sample: 1997 1999 Number of breaks compared: 3		Ho : No breakpoints within 30% trimmed data Test Sample: 1992 2004 Number of breaks compared: 13	
Statistic	Value(Prob.)	Statistic	Value(Prob.)
Max^M LR F-statistic (1998)	0.87277(0.7986)	Max^M LR F-statistic (1998)	2.07671(0.1870)
Max^M Wald F-statistic (1998)	7.85497(0.7986)	Max^M Wald F-statistic (1998)	18.6904(0.1870)
Exp LR F-statistic	0.42164(0.6331)	Exp LR F-statistic	0.50926(0.5903)
Exp Wald F-statistic	3.80072(0.6319)	Exp Wald F-statistic	6.91509(0.1953)
Ave LR F-statistic	0.84311(0.5831)	Ave LR F-statistic	0.96524(0.4741)
Ave Wald F-statistic	7.58807(0.5831)	Ave Wald F-statistic	8.68716(0.4741)

Note: probabilities calculated using Hansen's (1997) method

Another structural break test for unknown breakpoints is Quandt-Andrews test which allows to select different breaks scenarios. Accordgily, two scenarios were identified. These are 30 % and 45% of the data as a trimming point. Based on this; the result indicates that there are no breaks at the specified points for the export of large and medium scale manufacturing industry commodities (we accept the null hypothesis). The result is in consistent with the previous chow test's result.

Finally, the study applied stability test based on the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests proposed by Brown *et al*. (1975). Unlike the Chow test, that requires break point(s) to be specified, the CUSUM tests can be used even if we do not know the structural break point. The CUSUM test uses the cumulative sum of recursive residuals based on the first n observations and is updated recursively and plotted against break point (Lulseged 2011).

Figure 5.1: Plot of Cumulative Sum of Recursive Residuals

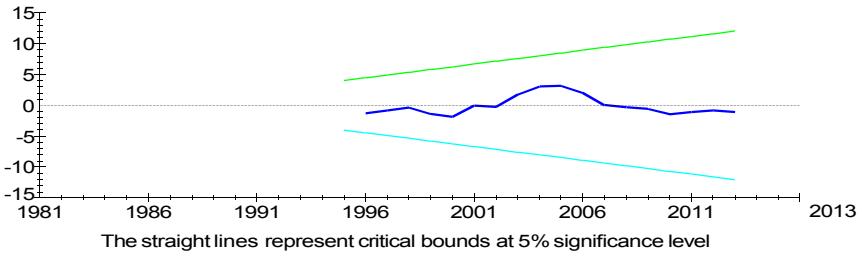
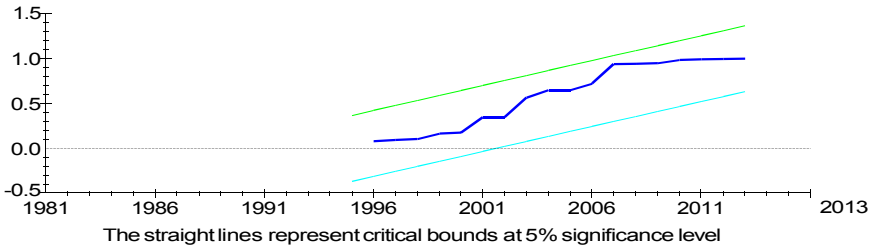


Figure 5.2: Plot of Cumulative Sum of Squares of Recursive Residuals



The above two graphs shows that two plots disclose that the plots of CUMSUM and CUMSUMSQ stay within the lines, and, therefore, this confirms the equation is correctly specified and the model is stable. Furthermore, the results reveal that there is no structural instability in the model during the sample period. The selected model adopted in study seems to be good and robust in estimating the short run and long run relationships between exports and its determinates of large and medium scale manufacturing industry. Hence, the null hypothesis of parameter stability cannot be rejected at 5% critical bound.

5.3 Econometric Analysis of the Employment Model

5.3.1 Bound testing approach

Given that all variables under employment model are integrated of order zero and one (none of them is integrated of order two), we can processed to the long run model estimation. But, before the estimation of the long run model it's important to determine the existence of long run relationships and these is done by using Eviews 9 for each variables based on the Akaike information criterion using maximum of two lag length which is recommended for an ARDL model.

Table 5.9: F-tests on bounds co-integration procedure

Variables	AIC Lags	F-statistics	Probability	Decisions
Lemp | lwag,lskill,lexp,lvape,leff,rir	2	7.78	0.000031	Cointegrated
Lrwag | lemp,lskill,lexp,lvape,leff,rir	2	6.68	0.000003	Cointegrated
Lskill | lrwag,lemp,lexp,lvape,leff,rir	2	8.15	0.000427	Cointegrated
Lexp | lrwag,lskill,lemp,lvape,leff,rir	2	2.91	0.011399	Inconclusive*
Lvape | lrwag,lskill,lexp,lemp,leff,rir	2	5.73	0.000246	Cointegrated
Leff | lrwag,lskill,lexp,lvape,lemp,rir	2	10.40	0.000031	Cointegrated
rir | lrwag,lskill,lexp,lvape,leff,lemp	2	10.05	0.000000	Cointegrated

Note: shows inconclusive long run relationships at 10%. In each functions constant and trends included and K=6 plus the lower and upper bound are based on Pesaran et al. critical values of Eviews9*

The result indicates that the presence of strong relationships among the whole macro variables under study except export with other macro variables which is inconclusive at10% and no long run relation at all for other critical values. For each relation the F-statistics compared with the lower and upper bound critical values of the Pesaran et al. table (2001).

5.10: Results of F-Test or variable addition test for Cointegration

Dependent variable is LEMP and 33 number of observations from 1978 to 2013				rir(-1)
Variables add to the regression		Lemp(-1)	Lrwag(-1)	Lskill(-1)
		Lexp(-1)	Lvape(-1)	Leff(-1)
Regressors	Coefficient	Std. Error	t-Statistic	Prob.
D(LEMP(-1))	0.411360	0.297656	1.382000	0.1860
D(LRWAG)	*0.430329*	*0.122040*	*3.526132*	*0.0028*
D(LRWAG(-1))	*0.482114*	*0.129305*	*3.728492*	*0.0018*
D(LSKILL)	0.350562	0.198868	1.762791	0.0970
D(LEXP)	-0.007019	0.038974	-0.180104	0.8593
D(LEXP(-1))	-0.085994	0.040804	-2.107504	0.0512
D(RIR)	-0.004653	0.001498	-3.105703	0.0068
D(RIR(-1))	0.002638	0.001397	1.888949	0.0772
C	2.629768	1.878684	1.399792	0.1807
@TREND	-0.010257	0.004196	-2.444469	0.0265
LRWAG(-1)	-0.059634	0.078000	-0.764542	0.4557
LSKILL(-1)	0.171407	0.109555	1.564573	0.1372
LEXP(-1)	0.227981	0.067246	3.390274	0.0037
LVAPE(-1)	-0.036250	0.059654	-0.607679	0.5519
LEFF(-1)	-0.043346	0.086196	-0.502883	0.6219
RIR(-1)	-0.009370	0.002082	-4.500806	0.0004
LEMP(-1)	-0.488265	0.193922	-2.517840	0.0228

Diagnostic tests

R-squared	0.900900	Akaike info criterion	-3.156550
Adjusted R^2	0.801800	Schwarz criterion	-2.385622
Log likelihood	69.08308	Durbin-Watson stat	2.302620
F-statistics	9.090833	Prob (F-statistics)	0.000031

Pesaran et al. Critical Values (2001)

F-statistics		Significance	I(0) Bound	I(1) Bound	Inferences
value	k	10%	2.53	3.59	Exist Relationship
7.784717	6	5%	2.87	4	Exist Relationship
		2.5%	3.19	4.38	Exist Relationship
		1%	3.6	4.9	Exist Relationship

Moreover, it's very important to see the long relationships of the employment with the rest of the variables since it's our primary goal and the results are displayed on table 5.10 above. Similarly to the Table5.9 results, Table 5.10 indicates the presence of a long run relationship between the

dependent variable, employment and the repressors that taken as its determinants. As indicated in table 5.10, the computed F-statistic is 7.78 which is surprisingly higher than all critical values of the Pesaran et al table (2001). Therefore, the null hypothesis of no co-integration between the employments and its determinants under the study must be rejected and accept the alternative hypothesis (Co-integration exist).

5.3.2 Co-integration and Long run parameters

Once the existence of the long run relationships between the employment and the regressors confirmed, the next step in the ARDL technique of co-integration is to carry out a two-step procedure to estimate the model. The following ARDL $(k_1, k_2, k_3, k_4, k_5, k_6 \; and \; k_7)$ specification used to determine the full model.

$$lnEmp_t = b_0 + \sum_{i=1}^{k_1} b_1 \, Emp_{t-i} + \sum_{i=0}^{k_2} b_2 \, lnrwag_{t-i} + \sum_{i=0}^{k_3} b_3 \, lnskill_{t-i} + \sum_{i=0}^{k_4} b_4 \, lnExp_{t-i} + \sum_{i=0}^{k_5} b_5 \, lnVape_{t-i} + \sum_{i=0}^{k_6} b_6 \, lnEff_{t-i} + \sum_{i=0}^{k_7} b_7 \, lnRIR_{t-i}$$

For each variables a maximum of two lags used ,i_{max}=2 using E-views9 based on the AIC and the ARDL(2,2,1,2,0,0,2) is obtained and the results are summarized on table 5.11.

Both tables, 5.11 and 5.12 shows the long run estimates for the estimated ARDL (2, 2, 1, 0, 0,2) model using the ordinary least square technique. The result indicates that skill of workers and export are positively affecting the demand of employment in the long run while and real interest rate and real wage rate negatively determine the labor in LMSMI employment. Value added per employees and workers efficiency does not affect employment in the long run. And, these results affirms that the skill of workers positively determine the employment demanded by manufacturers, factor cost (real wage) negatively affect the labor demanded and export also positively affects the employment demanded by large and medium scale manufacturers in Ethiopia and these goes in line with human capital theory, classical model and the Kaldor's law respectively.

Table 5.11: Autoregressive Distributed Lag Estimates (Full Model) ARDL (2, 2, 1, 2, 0, 0, 2) selected based on Akaike info criterion (AIC)

Regressors	Coefficient	Std. Error	t-Statistic	Probability
LEMP(-1)	***0.878254***	***0.222961***	***3.939046***	***0.0012***
LEMP(-2)	-0.333699	0.245947	-1.356793	0.1937
LRWAG	***0.440110***	***0.112184***	***3.923115***	***0.0012***
LRWAG(-1)	0.043447	0.131321	0.330847	0.7451
LRWAG(-2)	***-0.537388***	***0.121343***	***-4.428679***	***0.0004***
LSKILL	*0.249432*	*0.22632*	*1.1021*	*0.2867*
LSKILL(-1)	-0.154723	0.148066	-1.044963	0.3116
LEXP	-0.001348	0.036435	-0.037008	0.9709
LEXP(-1)	***0.115462***	***0.040424***	***2.856261***	***0.0114***
LEXP(-2)	***0.087877***	***0.032825***	***2.677139***	***0.0165***
LVAPE	-0.039952	0.057863	-0.690463	0.4998
LEFF	-0.056008	0.078327	-0.715059	0.4849
RIR	***-0.004836***	***0.001482***	***-3.262798***	***0.0049***
RIR(-1)	***-0.002680***	***0.001376***	***-1.947924***	***0.0692***
RIR(-2)	***-0.002470***	***0.001255***	***-1.967359***	***0.0667***
C	2.835936	1.824240	1.554585	0.1396
R-squared	0.992119	Mean dependent var	11.55116	
Adjusted R-squared	0.984239	S.D. dependent var	0.325469	
S.E. of regression	0.040861	Akaike info criterion	-3.250901	
Sum squared resid	0.026714	Schwarz criterion	-2.479973	
Log likelihood	70.63987	Hannan-Quinn criter.	-2.991507	
F-statistic	125.8915	Durbin-Watson stat	2.501325	
Prob(F-statistic)	0.000000			

The study has also similar findings of the Alwyn Yong (1993) for the positive impact of export (outward based economy), Getinet Haile and Fallahi et al. (2011) for positive influence of workers skill on labor employment, Yusoff and Sallah (2013), and Heshamati (2003) regarding the negative impact of wage rate and the negative effects of real interest on labor employment by Andrew Maredza et al. (2013).

Table 5.12: Estimated Long Run Coefficients using the ARDL Approach ARDL (2, 2, 1, 2, 0, 0, 2) selected based on Akaike info criterion (AIC)

Regressors	Coefficients	Standard Errors	T-Ratio(Prob.)
LRWAG	-0.118194	0.175016	0.675333(0.5091)
LSKILL	**0 .26832**	**0.149265**	**1.797645(0.0911)**
LEXP	**0.443503**	**0.199702**	**2.220824(0.0411)**
LVAPE	-0.087721	0.157988	-0.555236(0.5864)
LEFF	-0.122975	0.153337	-0.801991(0.4343)
RIR	**-0.021925**	**0.007641**	**-2.869566 (0.0111)**
C	**6.226746**	**2.219865**	**2.805011(0.0127)**

Note: All variables are in log forms except the real interest rate,
Results produced using E-views 9

The real wage rate is negatively determining the level employment to be demanded in the LMSMI of Ethiopia for the study period in the long run. Though the expected sign meet the theoretical expectations, its impact on employment level of large and medium scale manufacturing industry is insignificant in the long run. The result is not miracle for a country like Ethiopia where labor is abundant and cheap in referring to the nature of the industry. Meaning, most LMSMI's are not technologically sophisticated that demand skilled manpower and even those industries that have better technology such as new entering enterprises they came with a new labor saving technology (EEA, 2014).

Similarly, the employment of labor in the LMSMI negatively influenced by real lending interest rate in the long run. Though the coefficient is small, the real lending interest rates negatively determine the employment of labor (One percent decrease in the real lending interest rate leads to 2 percent increment in the employment of labor).This small coefficient may be due to long period credit, very low interest rate and interest rate free lending to the selected large and medium manufacturing industry.

The skill of workers positively affects the employment of labor in LMSMI with relatively high coefficient with less significance. Skilled workers are demanded by employers due to efficiency in production, time and cost minimization which is also true under this study (one percent

increase in the skill of worker lead to 0.26 percent increment in employment of labor in the long run) and for the 10% level of significance it may be due to the substitution rate of human power by technological based equipment's in LMSMI.

Employment of labor in LMSMI also positively affected by the export capacity of the producers in the long run and the level of significance is too high which means a one percentage increase in export of LMSMI leads an increase the employment of labor by 0.44 percent. This result assures the direct effect of manufacturing export on employment as postulated by Lavopa and Szirmai. The growth in manufacturing output export creates new jobs in manufacturing sector itself with well-paid and of good quality plus new jobs in other sectors through indirect input-output linkages.

However, unlikely to the theoretical expectation both the value added per employees and efficiency are not only insignificant but also negative to the employment of labor in the long run. But, these results have similarities that explained in chapter three of manufacturing overview where value added being low, fluctuating and limited to a few manufacturing firms and medium sized firms and absences of diversifications in the industry. Moreover, the nature of manufactured outputs are consumer goods which have low market price and less competitive in the international market.

5.3.3 Short Run dynamics and Error Correction Model

Following the long run relationship and long run parameters, the next step and the final assignment in the ARDL co-integration approach is the estimation of the short run dynamics using the ordinary least squire. The ECM shows the short run dynamics of the model which is consistent with the long run equilibrium of the model and asymptotically efficient estimates. ECM term is one period lagged residual saved from the estimated dynamic long run relationship that directly estimates the speed at which a dependent variable returns to equilibrium (steady state) after a change in an independent variable. Accordingly the ECM is estimated using the OLS in ARDL approach and the results are reported in Table 5.13.

Table 5.13: Estimated results of the Short Run Model Error-Correction Representation for the selected ARDL model ARDL (2, 2, 1, 2, 0, 0, 2) selected based on Akaike Information Criterion

Dependent variable is LEMP				
33 observations used for estimation from 1981 to 2013				
Regressor	Coefficient	Standard Error	T-Ratio	Probability
D(LEMP(-1))	0.33370	0.24595	1.3568	0.190
D(LRWAG)	-0.44011	0.11218	3.9231	0.001
D(LRWAG(-1))	-0.53739	0.12134	4.4287	0.000
D(LSKILL)	0.26833	0.14927	1.7976	0.087
D(LEXP)	0.132580	0.04446	2.98144	0.009
D(LEXP(-1))	0.105507	0.03863	2.73067	0.015
D(LVAPE)	-0.039952	0.05786	-0.69046	0.498
D(LEFF)	-0.056008	0.078327	-0.71506	0.483
D(RIR)	-0.004835	0.001482	-3.2628	0.004
D(RIR(-1))	0.002469	0.001255	1.9674	0.063
D(C)	2.8428	1.8251	1.5576	0.135
ECM(-1)	-0.45544	0.21903	-2.0794	0.051
R-Squared	0.90982	R-Bar-Squared	0.81965	
S.E. of Regression	0.040861	F-stat. F(12,20)	13.4524[.000]	
Mean of Dependent Variable	0.042631	S.D. of Dependent Variable	0.096215	
Residual Sum of Squares	0.026714	Equation Log-likelihood	70.6399	
Akaike Info. Criterion	53.6399	Schwarz Bayesian Criterion	40.9196	
DW-statistic	2.5013			
ECM = LEMP + .11819*LRWAG -.24943*LSKILL -.44350*LEXP + .087721*LVAPE + .12298*LEFF + .021925*RIR -6.2418*C + .015083*T				

Unlike to the long run effect that real wage rate is significantly negative in determining the employment of labor in LMSMI. The impact is not only negative but also the coefficient is high which indicates the sensitivity of real wage rate in determining the level employment. One of the possible reasons for such responsiveness is that the employers investing in large and medium scale industry primarily focus on the nature of labor (whether labor cost is cheap or not) and theoretical, for example the neo-classical economist, assumed that increased wage rate leads to an increase in the cost producing firms, forcing them to raise their selling prices. As the price of the product rises consumers will buy less of it and less output will be produced and sold. This

means that less labor will be used and vice-versa. In our country where most LMSMI are labor intensive firms, abundant and high unemployment rate, employers allocate their resources where labor is cheap (they are wage sensitive). For example, when the wage rate increased by 1%, the employment of labor decreases to 0.44 percent in LMSMI in the long run. Thus, real wage rate is a very crucial determinant of employment in the large and medium scale manufacturing industry.

Though the export of manufactured output is too small as discussed in an overview part, it has a huge potential in determining the employment of labor both in the short run and in the long run too. The level of significance is too high in the short run like in the long run though the coefficient is smaller than the long run (a one percentage increase in exporting of large and medium manufacturing output leads to 0.13 percent increase in employment of labor).

The skill of workers is not only significant in the long run but also in short run with small coefficient and this small coefficient may be due to shortage of working resources, working habit of the manufacturers and refined employees unable to assigned related working activities. Similarly the lending interest rate is also significant in the short run like in the long run but the coefficient is almost nil and this may be due to its return being after period of time and time holiday given to the borrowers in the LMSMI. And, both the value added per employees and workers efficiency also insignificant in the short run like the long run phenomena.

Above all, the coefficient of the ECM term shows that it is significant and has the right sign giving further evidence of the existence of cointegration among the time series variables. It indicates that about 45% of the disequilibrium in the previous period is adjusted in the current period and the rest 55% by the next year. It means it takes about more than two years for the disequilibrium in employment of labor to come back to its equilibrium (the full adjustment is made after two years to eliminate the disequilibrium).

5.3.4 Diagnostic Test

After the estimation process of the model, it is a must to check the estimation results and the inferences are trustworthy (Robust model exist). Among the number of diagnostic tests, the study applied Serial correlation, Functional form test, normality test and heteroskedasticity tests.

Test of residual serial correlation

Table 5.14 shows both the lagrange multiplier and the F-statistic must accept the null hypothesis meaning falls to reject the null hypothesis where there no serial dependence among the errors. Thus, the study could not find any evidence of autocorrelation problem in the residuals.

Functionality Test

Ramsy's RESET test using the square of fitted values applied to test the Functionality form and the results shows model is correctly specified meaning we couldn't reject the null hypothesis (accept the null hypothesis). Moreover, Furthermore, failing to reject the null in Ramsey reset test also further confirms that our model did not suffer from omitted variable bias (Lulseged, 2011).

Normality Test

Normality is checked mainly by using the Jarque Bera test and the result indicates residuals are normally distributed or residuals follow normal distribution (see appendix 8). Since the lagrange multiplier P value (0.406) is greater than the value that lead us to the rejection of the null i.e.at 5% level of significance.

Heteroskedasticity Test

The study falls to reject the null hypothesis of no heteroskedasticity in the residual at 5% level of significance. This shows that there is no heteroskedasticity and indicates the existence of constant variance (that is the residuals of the model are found to be Homoscedastic).

Table 5.14: Diagnostic Test Results

Test	LM Version	F-version
A: Serial Correlation	CHSQ(2)=2.9713(0.2263)	F(2,13)=0.6653(0.5308)
B: Functional form	CHSQ(2)=3.7955(0.1499)	F(2,13)=0.8185(0.4626)
C: Normality	CHSQ(2)=1.0513(0.5911)	Not Applicable
4: Heteroskedasticity	CHSQ(16)=14.4062(0.5685)	F(16,15)=0.7676(0.6976)
A: Lagrange Multiplier Test of residual serial correlation. B: Ramsy's RESET test using the square of fitted values C: Based on a test of skewness and kurtosis of residuals. D: Based on the regression of squared residuals on squared fitted values.		

5.3.5 Model Stability – The CUMSUM Test

The last step but not the least steps in the ARDL estimation is that the stability of the model. In words, it is very indispensable to test for parameters stability. Pesaran and Shin (1997) suggested that structural stability of the long-run and short-run relationships for the entire period is better examined by the cumulative sum (CUMSUM) and the cumulative sum of squares (CUMSUMSQ) of the recursive residual test as proposed by (Brown et al, 1975) to assess the given parameter consistency.

The CUSUM test uses the cumulative sum of recursive residuals based on the first n and is updated recursively and plotted against the points. The CUSUMSQ makes use of the squared recursive residuals and follows the same procedure. If the plot of the CUSUM and CUSUMSQ stays within the 5 percent critical bound the null hypothesis that all coefficients are stable cannot be rejected. If however, either of the parallel lines are crossed then the null hypothesis (of parameter stability) is rejected at the 5 percent significance level. Figure (5.1 and 5.2) evidently shows that both the CUSUM and CUSUMSQ plots lie within the 5 percent critical bound thus providing evidence that the parameters of the model do not suffer from any structural instability over the entire period of study.

Figure 5.3: Plot of Cumulative Sum of Recursive Residuals

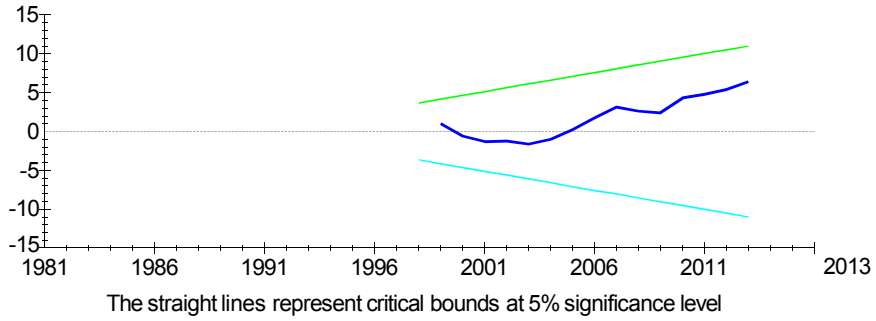
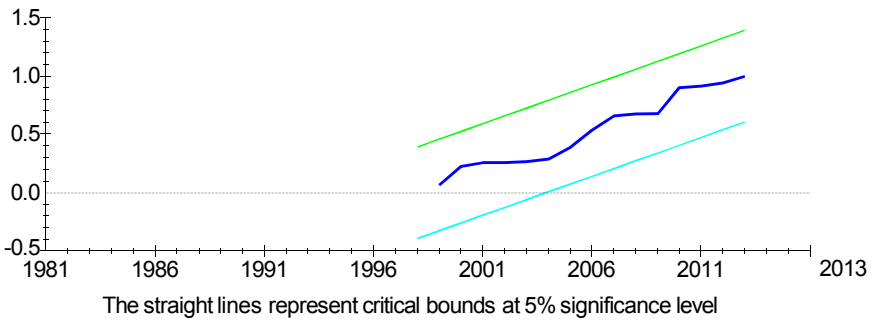


Figure 5.4: Plot of Cumulative Sum of Squares of Recursive Residuals



In conclusion, the model stability test using cumulative sum (CUMSUM) and(CUMSUMSQ) control chart also confirmed that the null hypothesis of parameter stability cannot be rejected at the 5% critical bound. Thus, the parameters of the estimated employment model do not suffer from any structural instability over the period of study.

CHAPTER SIX: CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusions

The objective of this study is to investigate the determinants of export and employment in large and medium scale manufacturing industry of Ethiopia both descriptively and empirically by using a time series date from 1978/79 to 2012/13. The method used is a bound testing approach to co-integration developed within ARDL framework to examine the short run and long run relationships between A) export, real GDP to population ratio of Ethiopia, Africa, Europe, USA and Far East, Domestic infrastructure development and Real Effective exchange rate B) employment, real wage rate, skill of workers, value added per employees, efficiency and real lending interest rate.

The major contribution of this study is that, unlike other studies who consider export determinants at aggregate level, its contribution to the GDP and on selected firms, it used a disaggregate data by taking the two major macroeconomic variables namely export and employment in large and medium scale manufacturing industry at a country level.

Despite the promising improvement both in export and employment of labor in large and medium scale manufacturing industry, still the contribution to the GDP and employment of labor is very small. Furthermore, the share of export in the real GDP and level employment is very far from the base case GTP-I scenario and the nature of exporting items are still depends on consumer goods and employment growth in large and medium scale manufacturing industry do not have consistency trends for the whole period of the study. Generally, the relationships between export and the explanatory variables and similarly the relationship between employment and the explanatory variables have been discussed with the help of graph and tables.

The study found evidences that export of large and medium scale manufacturing industry items, domestic infrastructure development, real effective exchange rate, real GDP to population ratio of Ethiopia, Africa, Europe, USA and Far East are bound together in the long run. The evidence also suggested that the export of LMSMI is positively affected by real GDP to population ratio of Ethiopia and domestic infrastructure development while real effective exchange rate and real GDP to population ratio of Africa affect negatively both in the short and long run. But real GDP to population ratio of Europe has only a positive effect on the export of large and medium scale manufacturing industry in the long run while real GDP to population ratio of Far East has no effect on both periods. And, the effect of real GDP to population ratio of USA only

positive during the short run. These result indicates that the market size of home economy is a potential source to engross the products of large and medium scale manufacturing industry while the market size of the rest of the world in determining the export of large and medium scale manufacturing products depend on the nature of exported items and bilateral relationships they have with Ethiopia.

Further a stability test using Chow test, Quand-Adrews, cumulative sum recursive residuals and cumulative sum of squares of recursive residuals suggested that the estimated parameters do not suffer from structural instability. The coefficient of the error term that captures the speed of adjustment towards the long run equilibrium is found with the correct sign and magnitude. The speed of adjustment is -0.7959 which implies that around 79% deviations from the long run equilibrium are adjusted every year and the rest 21% in the coming year. Thus, it takes around one year and three months to correct any deviation from the equilibrium.

Likewise, the study also found that the relationships between the employment of labor in large and medium scale manufacturing industry and the explanatory variables such as real wage, skill, export, value added per employees, efficiency and real lending interest rate are bound together in the long run. The study submitted that both skills of employees and the export level of LMSMI positively affect the employment of labor in LMSMI while real wage rate and real lending interest rate affect it negatively both in short run and long run. But, unlike to the theoretical expectations the value added per employee and efficiency of LMSMI do not have an impact on the employment of both in the short run and long run. The possible justification for such result may be due to the fact that low value added capacity of the industry, shortage of skilled manpower, fluctuations and absence of diversifications. Furthermore, the nature of most manufactured output being consumer goods which have low market value and less competitive in the international market.

The short run dynamics of employment and the explanatory variables is consistent with the long run equilibrium. The result revealed that the full adjustment is made after two years to eliminate the disequilibrium. Moreover, the diagnostic lagrangian multiplier test indicates that the short run does not suffer from any misspecification while the Ramsey's test showed that the model does not suffer from any misspecification problems. The model also passed the Jaque-Bera's normality test which indicates residuals are normally distributed and finally the residuals also found to be homoscedastic.

6.2 Policy Implications

The study has useful implications for both policy and future researchers in the area of macroeconomic determinants of export and employment of large and medium scale manufacturing industry of Ethiopia and even for LDCs which have similar nature of production and exports. The leading government has an ambitious plans and efforts; Ethiopia is challenged by absences of diversifications, dominance of consumer goods, poor linkages with other sectors and few manufacturing products. Therefore, to avoid these constraints and increase the relative significance and importance of large and medium scale manufacturing industry in stimulating economic growth and to bring structural change in the long run this study has the following policy recommendations.

First, though the role of the government exclusively for a country like Ethiopia which struggle to become lower middle income group is indispensable, it's is essential to the government of Ethiopia to redefine the role of the public sector as a catalyst, rather than a provider. For instance, as seen in chapter four most large scale industries are still public owned while medium and small scale industries are under the private control. Opening chances for private enterprises to join the large scale industry level will help them to acquire cost advantages which in turn added endurance on the degree of competitiveness in the international market and increase the coverage of the services and also reduce the burden on the public budget. Therefore, Ethiopian government has to adopt better framework of privatization programme that increase the capacity of large and medium scale manufacturing industries to meet large scale level. Furthermore, the government should also give priorities for new investors that participate on capital goods rather than the usual enterprises of consumer goods producers. This is due to the fact that investment on capital goods (called real investment) enables more output of consumer goods to be produced in the long run i.e. standard of living can increase in the future by more than they would have if the country had not made as short term sacrifice and relative to consumer goods capital goods have higher market value and it turns out that capital goods prices have been central to accumulation, and therefore to growth and convergence.

The second and most importantly, the market size of United States of America has been found a positive effect on export of large and medium scale manufacturing industries in short run. This

implies that a bilateral agreement with the trading partners has a vital role in enhancing the foreign earning potential from manufacturing sectors and this goes in line with the AGOA. Thus, large and medium scale manufacturers should have to use such opportunities before end of the legislation. On the other hand, the market size of Europe only significant in the long run and this implies that our manufacturing exports get acceptance after a period of time (not immediately).Therefore, the manufactures should make an aggressive advertisement, use opportunity of international trade fare bazaars and the government also have to creates market opportunities to participate in international trades and provides incentives to increase the competitiveness of the industry. Unlike the two, the market size of Africa excluding Ethiopia has a negative effect on export of large and medium scale manufacturing sectors. Thus, to change the directions and use the market size of Africa, manufactures should diversified and add values to the exported commodities

Thirdly, the country needs to strengthen the fundamental balance of economic policy, something that involves an appropriate exchange rate, interest rate that goes and close to with those of the trading partners of the country to reduce macroeconomic uncertainty, competitive and predictable exchange rate along with stable terms of trade, long term strategies of public investment projects and an optimal allocation of domestic resources to the private sector. These goals need to be consistent with both internal and external equilibrium. So that, the policy of industrialization can become viable and maintaining the self-sustaining growth at large.

The fourth policy message of this study is in line with positive impact of home economy market size. The recent trends show that countries focused to base the market demand on domestic sources to reduce external shocks consequences. Hence, it crucial to use and improve the home market size of home economy and encourage the domestic consumers by using different tools such advertisements, lotteries, credit facilities etc. and the common aggressive sale motto called "Buy Ethiopian".

Fifth, despite the abundant and cheap labor, the real wage rate which had negative effect in the short run should be managed in order to increase employment of labor in large and medium scale manufacturing industry. Therefore, our universities have to produce student that specialize in specified and selected fields of study rather than on general fields of study that goes to the industrial sector of the country and manufactures must equipped workers with relevant skills through short and long term trainings. Similarly, the government should keep the incentives

provided to manufacturing exporters till they maintain full potential and internationally competent and reduces bureaucracies since export in large and medium scale manufacturing sector has positive and significant effect in heightening of labor employment in large and medium scale manufacturing sector.

Finally, the policy message of this study is line with the significance of both value added per person engaged and efficiency which is the opposite from the theoretical expectations. From the old saying, time is money, in the world of manufacturing industries the more time manufactures waste the more it costs to make their products and hence the less profit the owners have to take home which in turn leads a negative impact on the employment of labor or the better they get at working efficiently the better their profit will be and thus the positive effect on employment of labor. Therefore, both the government and the private manufactures should provide trainings to the employees, empower managers, prioritizing, proper allocation of resources, proper information systems, e-commerce etc.

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Appendices

Appendix 1: Employment since 2002, Growth in %

SUB-SECTORS	SDPRP AVERAGE	PASDEP AVERAGE	GTP AVERAGE	Whole VERAGE	
FOOD & BEVERAGES	3.19	14.18	-3.65	4.57	
TOBACCO	-4.03	9.69	-10.59	-1.64	
TEXTILES	-2.39	7.78	37.10	14.16	
WEARING APPAREL, EXCEPT FUR APPAREL	-8.78	33.03	10.64	11.63	
LEATHER &FOOTWEAR	5.51	6.52	19.96	10.66	
WOOD & CORK, EXCEPT FURNITURE	6.89	21.10	20.50	16.16	
PAPER & PRINTING	6.93	6.03	-0.64	4.11	
CHEMICALS	5.94	14.41	12.62	10.99	
RUBBER AND PLASTIC PRODUCTS	10.20	19.90	131.24	53.78	2ND
NON-METALLIC MINERAL PRODUCTS	3.60	17.82	27.49	16.30	
BASIC IRON AND STEEL	6.95	28.75	0.91	12.20	
FABRICATED METAL	12.20	28.51	19.68	20.13	4TH
MACHINERY AND EQUIPMENT	6.56	81.78	190.81	93.05	1ST
MOTOR VEHICLES	4.70	17.03	73.66	31.80	3RD
FURNITURE	23.22	1.13	5.58	9.98	
Total	3.61	11.40	15.90	10.30	

Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey (Own computation)

Appendix 2: Percentage share of employment by industrial subsectors from total employment in LMSMI

SUB-SECTORS	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	Average
FOOD & BEVERAGES	**30.15**	**29.76**	**29.04**	**30.12**	**28.65**	**31.67**	**30.54**	**32.48**	**38.68**	**27.51**	**18.94**	**29.74**
TOBACCO	**0.78**	**0.74**	**0.64**	**0.64**	**0.64**	**0.96**	**0.76**	**0.53**	**0.77**	**0.68**	**0.16**	**0.68**
TEXTILES	**21.63**	**21.73**	**18.97**	**18.66**	**17.42**	**8.14**	**11.19**	**11.55**	**7.75**	**16.45**	**12.46**	**15.73**
WEARING APPAREL, EXCEPT FUR APPAREL	**4.22**	**3.61**	**2.39**	**3.46**	**6.10**	**5.84**	**5.29**	**5.05**	**3.35**	**5.89**	**2.90**	**4.32**
LEATHER &FOOTWEAR	**7.13**	**7.27**	**7.25**	**6.68**	**6.70**	**6.59**	**5.94**	**5.78**	**8.08**	**7.64**	**6.61**	**6.88**
WOOD & CORK, EXCEPT FURNITURE	**1.65**	**1.53**	**1.43**	**1.49**	**1.61**	**2.43**	**1.43**	**1.76**	**2.30**	**2.05**	**2.01**	**1.75**
PAPER & PRINTING	**6.32**	**6.59**	**6.88**	**6.81**	**6.55**	**6.84**	**5.99**	**5.40**	**5.81**	**4.55**	**3.51**	**5.96**
CHEMICALS	**5.02**	**4.81**	**5.47**	**4.79**	**5.64**	**5.96**	**5.46**	**6.04**	**5.62**	**5.93**	**5.52**	**5.45**
RUBBER AND PLASTIC	**4.36**	**4.18**	**5.20**	**5.83**	**6.12**	**6.70**	**8.12**	**7.49**	**6.33**	**6.43**	**22.95**	**7.34**
NON-METALLIC MINERAL PRODUCTS	**7.73**	**8.67**	**8.29**	**8.52**	**8.94**	**12.93**	**13.44**	**10.53**	**9.94**	**12.26**	**13.43**	**10.26**
BASIC IRON AND STEEL	**1.45**	**1.61**	**1.61**	**1.79**	**1.54**	**1.02**	**1.16**	**2.17**	**2.84**	**1.69**	**1.36**	**1.64**
FABRICATED METAL	**3.36**	**3.28**	**3.51**	**4.90**	**2.82**	**3.98**	**4.00**	**5.39**	**3.48**	**4.25**	**4.84**	**3.88**
MACHINERY AND EQUIPMENT	**0.24**	**0.24**	**0.20**	**0.29**	**0.14**	**0.14**	**0.12**	**0.46**	**0.37**	**0.02**	**0.14**	**0.21**
MOTOR VEHICLES	**1.00**	**1.07**	**1.13**	**1.23**	**2.51**	**1.32**	**1.14**	**0.90**	**0.94**	**0.80**	**1.87**	**1.25**
FURNITURE	**4.96**	**4.89**	**8.00**	**4.80**	**4.59**	**5.47**	**5.40**	**4.46**	**3.73**	**3.85**	**3.32**	**4.89**

Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey (Own computation)

Appendix 3A: Wage Rate, Growth in %

SUB-SECTORS	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	Average
FOOD & BEVERAGES	-8.84	2.46	-3.69	8.92	-2.78	-13.14	21.64	8.37	-7.85	17.67	14.87	3.42
TOBACCO	-15.09	-7.41	-3.00	48.91	-0.46	50.30	-56.31	-29.40	-21.46	-17.23	28.76	-2.04
TEXTILES	-17.88	24.62	-28.17	1.88	-12.06	-53.14	53.63	28.37	-34.30	137.81	28.33	11.74
WEARING APPAREL, EXCEPT FUR APPAREL	9.42	-5.12	-43.94	76.93	109.31	-23.29	-18.26	49.50	-59.09	153.10	-28.59	20.00
LEATHER &FOOTWEAR	-19.59	-8.53	14.38	-2.93	-14.93	-21.37	8.62	13.13	12.18	20.53	61.99	5.77
WOOD & CORK, EXCEPT FURNITURE	24.24	3.33	-15.28	4.68	18.24	-10.77	-19.35	76.92	2.14	5.92	67.56	14.33
PAPER & PRINTING	-12.24	9.45	11.67	2.06	-2.95	-5.67	-1.42	6.26	-22.14	-7.96	52.26	2.66
CHEMICALS	0.58	3.19	9.86	-11.11	36.57	-22.89	5.14	48.11	-22.86	21.35	43.40	10.12
RUBBER AND PLASTIC	-7.00	6.33	11.87	3.52	0.14	-17.76	50.60	40.91	-37.30	18.05	11.69	7.37
NON-METALLIC MINERAL	5.71	1.90	-6.75	15.48	-1.26	32.01	5.10	-5.55	-20.12	80.32	-8.52	8.94
BASIC IRON AND STEEL	-0.65	5.96	18.35	-0.48	-14.39	-41.72	117.16	-2.94	18.72	-29.91	8.04	7.10
FABRICATED METAL	11.49	10.33	2.56	11.16	-6.87	-2.88	25.89	80.60	-50.62	49.91	91.30	20.26
MACHINERY &EQUIPMENT	-8.71	5.88	-1.08	616.78	-86.98	-28.00	11.38	524.96	-29.23	-91.78	547.69	132.8
MOTOR VEHICLES	0.03	25.28	-18.06	22.17	65.33	-44.45	3.13	-26.06	19.95	6.97	179.93	21.29
FURNITURE	-12.29	7.02	59.76	-37.56	3.76	-16.23	35.23	5.41	-34.42	39.22	47.76	8.88

Source: CSA, Report on large and medium scale manufacturing and Electricity industries survey (Own computation)

Appendix 3B: Wage Rate, Growth in %

SUB-SECTORS	SDPRP Average	PASDEP Average	GTP Average
FOOD & BEVERAGES	-3.4	4.60	8.23
TOBACCO	-8.5	2.61	-3.31
TEXTILES	-7.1	3.74	43.95
WEARING APPAREL, EXCEPT FUR APPAREL	-13.2	38.84	21.81
LEATHER &FOOTWEAR	-4.6	-3.50	31.57
WOOD & CORK, EXCEPT FURNITURE	4.1	13.94	25.21
PAPER & PRINTING	3.0	-0.35	7.39
CHEMICALS	4.5	11.16	13.97
RUBBER AND PLASTIC PRODUCTS	3.7	15.48	-2.52
NON-METALLIC MINERAL PRODUCTS	0.3	9.16	17.23
BASIC IRON AND STEEL	7.9	11.52	-1.05
FABRICATED METAL	8.1	21.58	30.20
MACHINERY AND EQUIPMENT	-1.3	207.63	142.23
MOTOR VEHICLES	2.4	4.03	68.95
FURNITURE	18.2	-1.88	17.52

Appendix 4: Labor Productivity

YEAR	labor Productivity	Inflation	Real Wage	Nominal Wage
2002/03	12.5	10.9	-8.3	7.9
2003/04	6.3	7.3	6.1	8.6
2004/05	2.7	6.1	-3.1	7.4
2005/06	13.0	10.6	5.6	17.0
2006/07	27.6	15.8	0.9	20.6
2007/08	13.7	25.3	-14.9	26.3
2008/09	14.7	36.4	15.6	19.5
2009/10	17.3	2.8	16.5	25.0
2010/11	38.2	18.1	-19.5	11.1
2011/12	1.9	34.1	32.7	60.4
2012/13	-6.1	13.5	25.9	35.3
Average	12.9	16.5	5.2	21.7

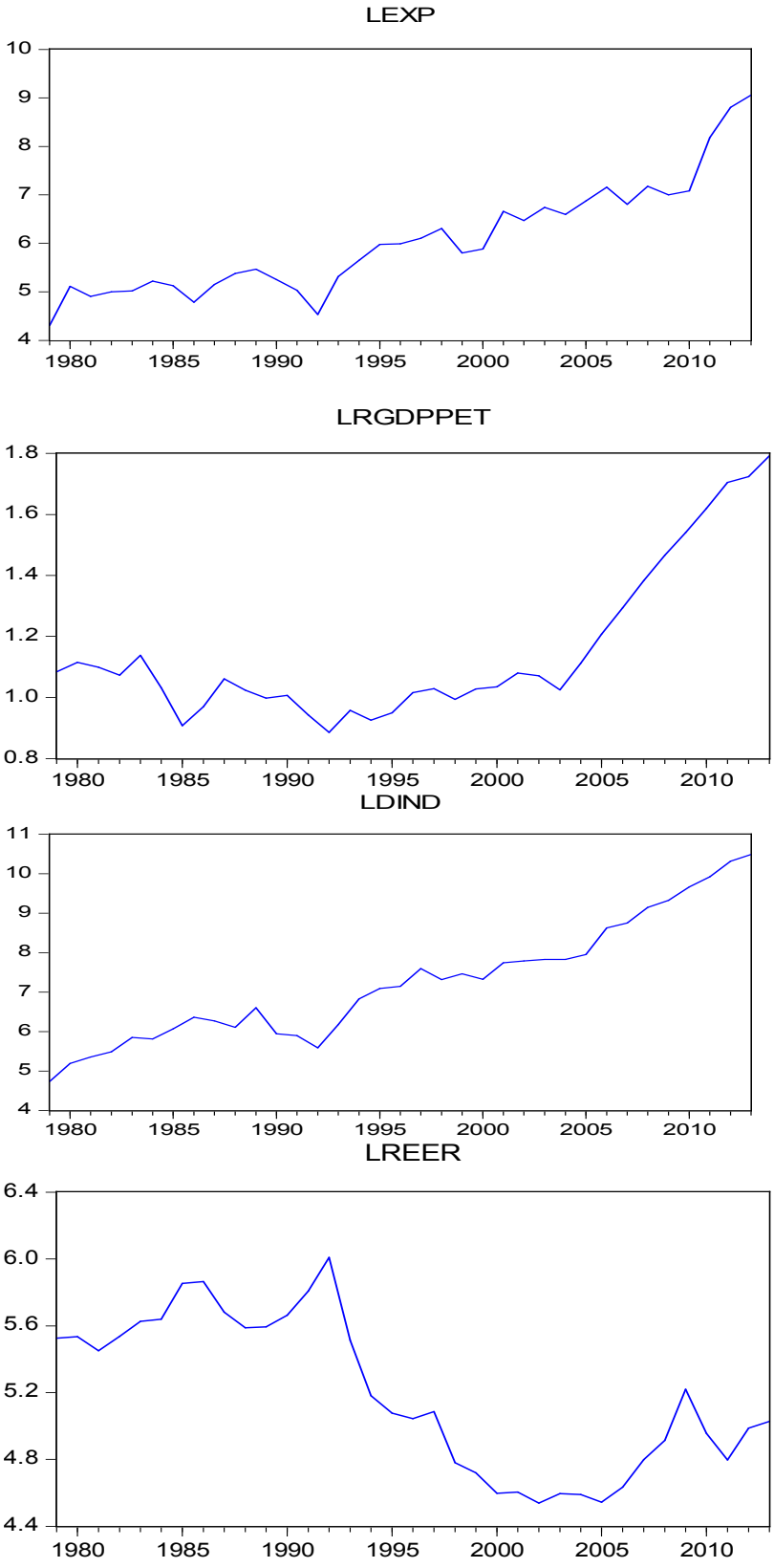
Source: Own computation based on the date from NBE and CSA

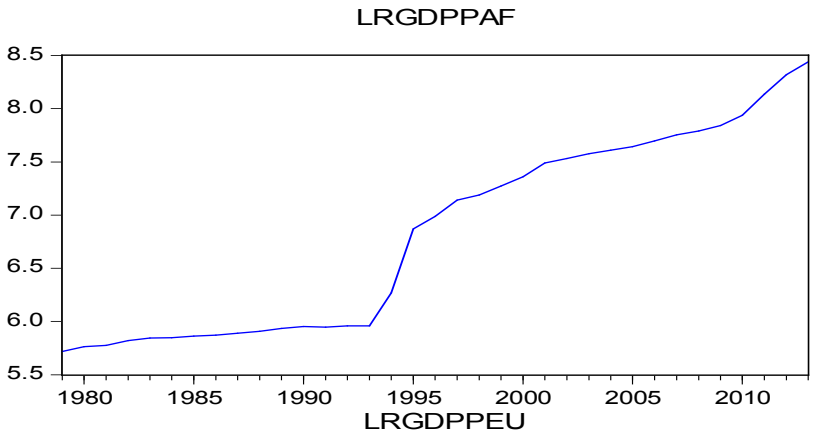
Appendix 5: Efficiency of targeted large and medium scale manufacturing Industry

SELECTED SUB SECTORS	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
Food and Beverage	**28.10**	**30.21**	**36.67**	**27.43**	**30.10**	**26.10**	**24.92**	**24.50**	**34.69**	**16.32**	**21.65**
Textile	**14.53**	**11.16**	**20.67**	**13.64**	**18.94**	**12.35**	**26.81**	**31.95**	**15.63**	**1.22**	**4.59**
leather and Footwear	**19.03**	**13.84**	**19.29**	**15.70**	**12.60**	**17.92**	**16.87**	**16.21**	**33.14**	**13.29**	**24.52**
Chemical	**21.64**	**19.19**	**30.39**	**19.17**	**20.70**	**20.48**	**26.61**	**24.39**	**29.60**	**21.29**	**28.76**
Non-Metallic	**20.99**	**30.01**	**40.44**	**34.38**	**43.36**	**44.84**	**36.50**	**50.72**	**37.92**	**34.85**	**40.68**
Total	**25.08**	**23.62**	**30.12**	**23.73**	**26.35**	**25.33**	**27.00**	**27.07**	**28.14**	**18.44**	**22.30**

Source: Own computation based on the date from CSA annual report

Appendix 6A: Variable used in Empirical Analysis at level and First Difference Data (1978-2013): Export model

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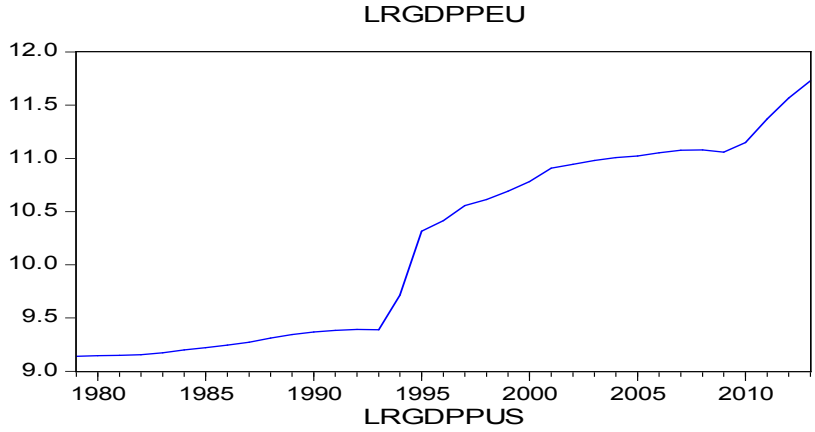
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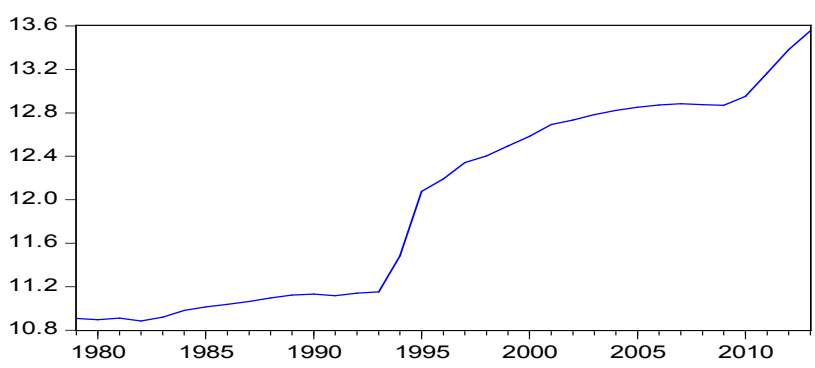
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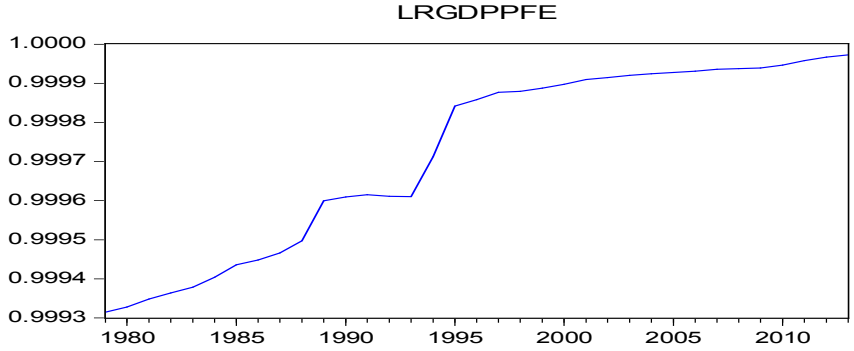
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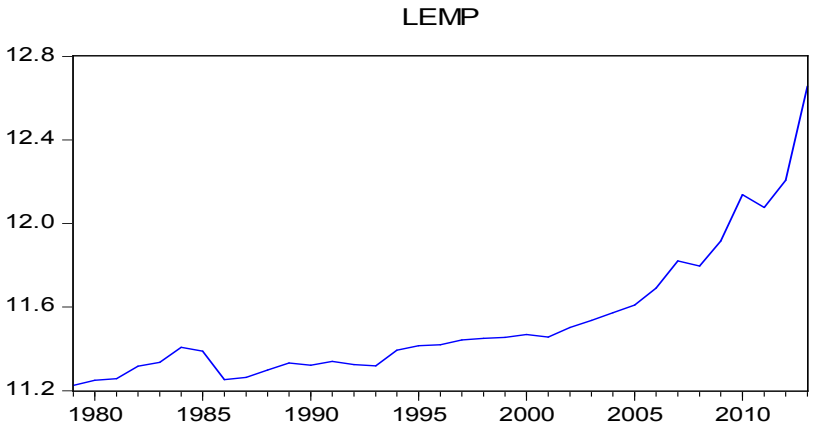
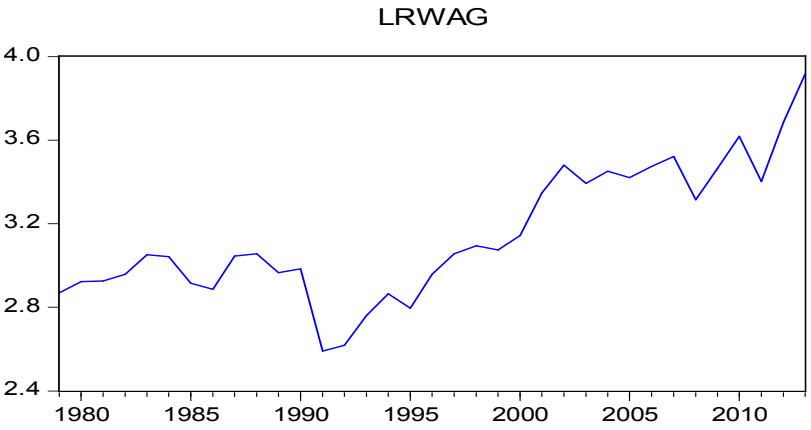
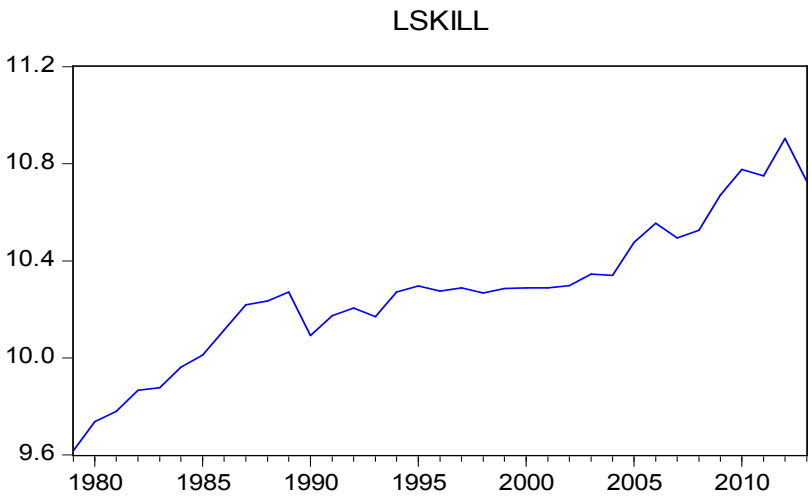
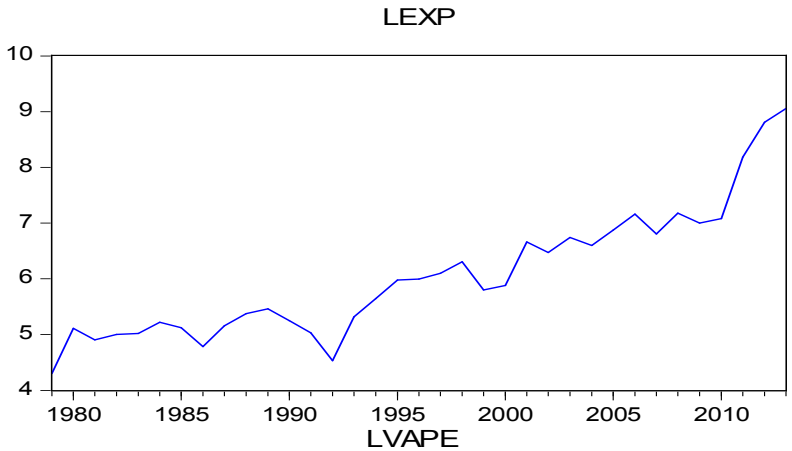
Appendix 6B: Variable used in Empirical Analysis at level and First Difference Data (1978-2013): Employment model





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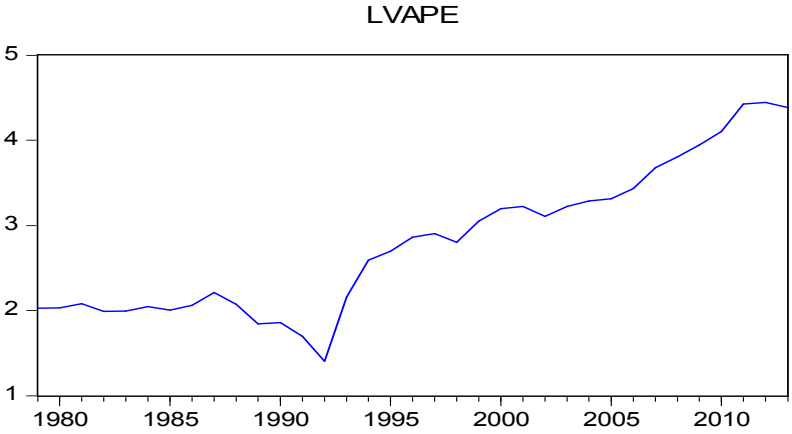
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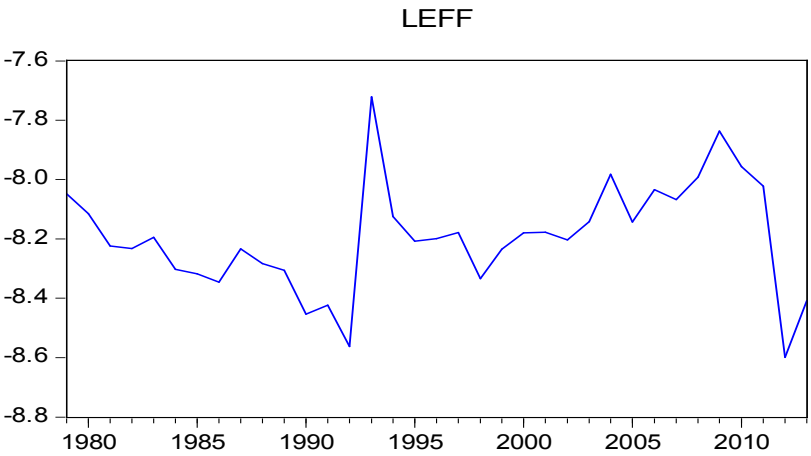
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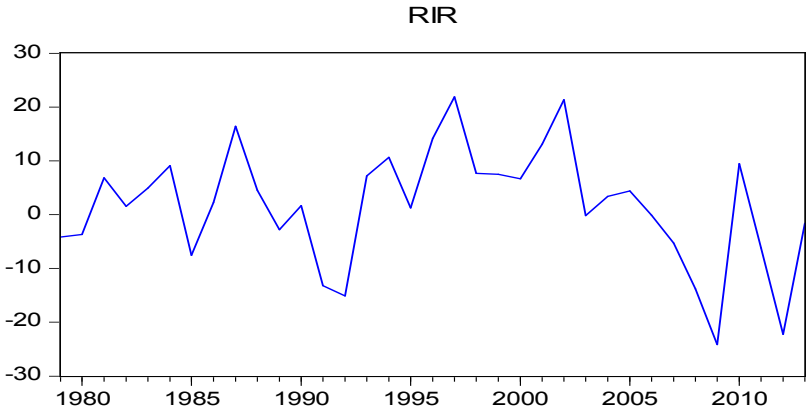
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1990
1995
2000
2005
2010

Appendix 7A: Unit Root Test Result Using Phillips-Perron Test for Export model

Variables	Test Statistics under different assumptions			Order of integration
	Intercept	Trend and intercept	No trend and no intercept	
LEXP	1.156900	-1.706845	3.240275	
D(LEXP)	-6.189531	-7.943386*	-5.663622	I(1)
LRGDPPET	1.955649	0.136272	1.945559	
D(LRGDPPET)	-4.139660	-6.032124*	-3.863377	I(1)
LREER	-1.233449	-1.589193	-0.595865	
D(LREER)	-4.552728*	-4.483081	-4.608745	I(1)
LDIND	0.405006	-1.439444	3.845862	
D(LDIND)	-6.261785	-6.468879*	-4.952578	I(1)
LRGDPPAF	0.468410	-1.915511	3.240912	
D(LRGDPPAF)	-3.339665**	-3.413160	-2.591620	I(1)
LRGDPPEU	0.317635	-2.066690	2.933675	
D(LRGDPPEU)	-3.328176**	-3.283130	-2.528933	I(1)
LRGDPPUS	0.334165	-2.083532	2.907966	
D(LRGDPPUS)	-3.128002**	-3.169628	-2.432735	I(1)
LRGDPPFE	-1.648936	-0.607784	3.121342	I(1)
D(LRGDPPFE)	3.666949*	-3.955598	-2.991401	

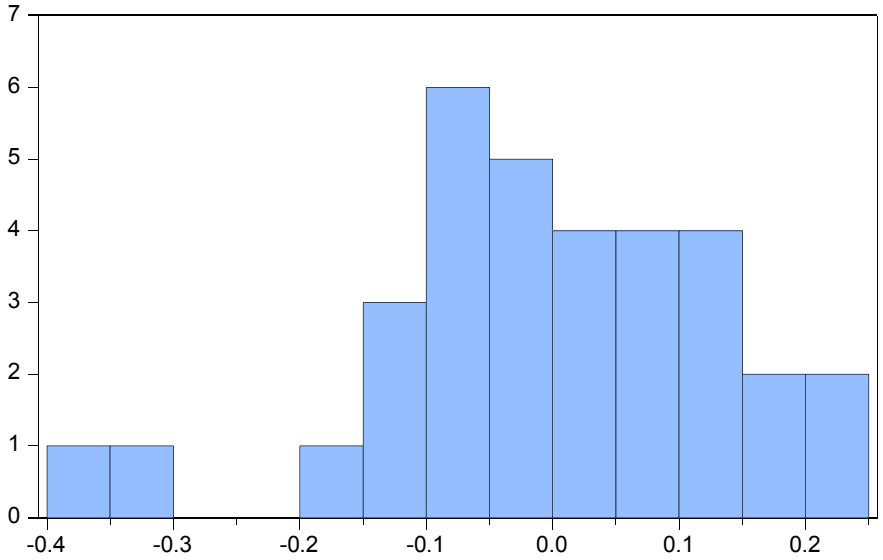
Note: D refers the variable is differenced once. Note: MacKinnon (1996) one-sided Critical values for rejection of a unit root are used here.* shows significant at 1%, ** significance at 5% and *** significance at 10%

Appendix 7B: Unit Root Test Result Using Phillips-Perron Test for Employment model

Variables	Test Statistics under different assumptions			Order of integration
	Intercept	Trend and intercept	No trend and no intercept	
LEMP	5.871188*	4.600071	2.237997	
D(LEMP)	-2.572683	-3.064882	-1.750321	I(0)
LRWAG	-0.167863	-1.572381	1.297207	
D(LRWAG)	-5.831484	-6.072449*	-5.629372	I(1)
LSKILL	-1.699532	-2.787054	2.422270	
D(LSKILL)	-6.470209*	-6.383498	-5.525496	I(1)
LEXP	1.156899	-1.706846	3.240275	
D(EXP)	-6.189531	-7.943384*	-5.663622	I(1)
RIR	-3.938560	-4.045928**	-3.925759	
D(RIR)	-8.562199	-8.494939	-8.741971	I(0)
LEFF	-3.915931**	-3.840115	1.103475	
D(LEFF)	-9.816771	-9.591104	-10.09305	I(0)
LVAPE	0.395531	-2.020736	2.121121	
D(LVAPE)	-4.626945*	-4.737332	-4.193642	I(1)

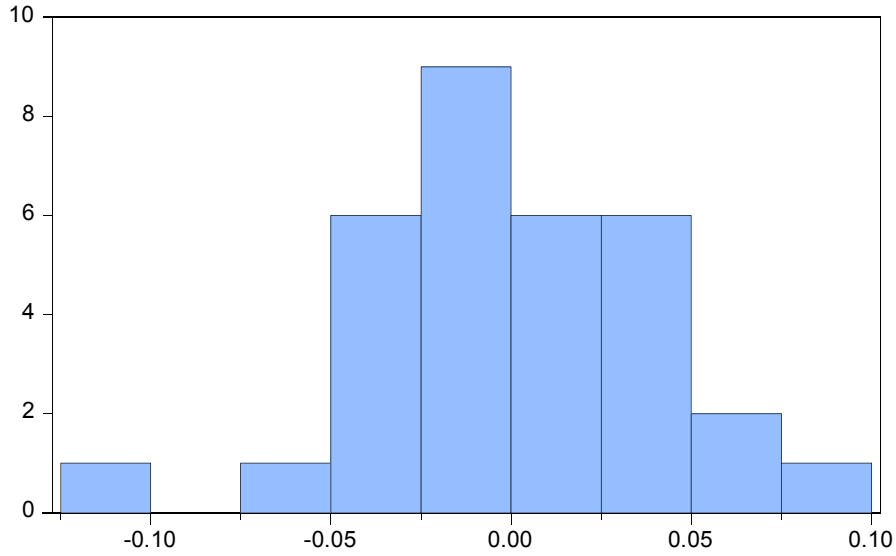
Note: D refers the variable is differenced once. Note: MacKinnon (1996) one-sided Critical values for rejection of a unit root are used here.* shows significant at 1% and ** significance at 5%

Appendix 8A: Residuals from the Export Model



Series: Residuals	
Sample 1981 2013	
Observations 33	
Mean	1.38e-14
Median	-0.022585
Maximum	0.241431
Minimum	-0.362335
Std. Dev.	0.136241
Skewness	-0.550596
Kurtosis	3.402139
Jarque-Bera	1.889719
Probability	0.388734

Appendix 8B: Residuals from the Employment Model



Series: Residuals	
Sample 4 35	
Observations 32	
Mean	-1.04e-17
Median	-0.001766
Maximum	0.080608
Minimum	-0.108598
Std. Dev.	0.038677
Skewness	-0.337351
Kurtosis	3.577296
Jarque-Bera	1.051323
Probability	0.591164

Appendix 9: Diagnostic Test Results for Export Model

Test	LM Version	F-version
A: Serial Correlation	CHSQ(1)=0 .63323[0.426]	F(1, 18)= 0.35216[0.560]
B: Functional form	CHSQ(1)=0 .27119[0.603]	F(1, 18)=0.14914[0.704]
C: Normality	CHSQ(2)= 1.8897[0.3887]	Not Applicable
4: Hetroscedasticity	CHSQ(1)= 0 .0027192[0.958]	F(1, 31)= 0.0025546[0.960]

A: Lagrange Multiplier Test of residual serial correlation.

B: Ramsy's RESET test using the square of fitted values

C: Based on a test of skewness and kurtosis of residuals.

D: Based on the regression of squared residuals on squared fitted values.

DECLARATION

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

The examiners' comments have been duly incorporated.

Declared by:

Name: Andualem Girma Ayalikbet

Signature: _____

Confirmed by advisor:

Name: Tadele Ferede (PhD)

Signature: _____

Place and Date of submission:
Addis Ababa, November/2015