Challenges of locally Assembled vehicle supply Chains in Ethiopia: Assemblers Perspective

A Thesis submitted to Addis Ababa University College of Business and Economics, School of Commerce in partial fulfillment of the requirement for the Award of Masters of Arts degree in Logistics and Supply Chain Management.

By: Nardos Habte

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Declaration

I the undersigned, declare that, this thesis is my original work and that all the sources of materials used for the thesis have been duly acknowledged.

Signed by: -

Name:- _____

Signature:- _____

Date:- _____

Statement of Certification

This is to certify that Nardos Habte has carried out her research work entitled "**Challenges of locally Assembled vehicle supply Chains in Ethiopia: Assemblers Perspective** "for the partial fulfillment of Masters of Arts in logistics and supply management at Addis Ababa University School of Commerce. To the best of my knowledge, this study is original and is suitable for submission of masters of Arts in logistics and supply chain Management.

Confirmation by Advisor:

Teklegiorgis Assefa (Asst.prof.)	_____	_____
Name	**Signature**	**Date**

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LIST OF ACRONYMS

SKD kits: Semi Knocked-Down kits

FBU: Fully Built-Up

GTP: growth transformation plan

GDP: Gross Domestic Product

EMs: Equipment Manufacturers

SC: Supply chain

LIS: logistics information systems

SCM: Supply chain management

CRM: Customer Relationship Management

SRM: Supplier Relationship Management

ACMs: automotive component manufacturers

NAACAM: National Association of Automotive Component and Allied Manufacturers

EIC: Ethiopian Investment Commission

SPSS: Statistical package for social science

ABSTRACT

This study was carried out on challenges of locally assembled vehicle supply chains in Ethiopia from assembler's perspective with regard to technological, cost, infrastructural, market or service, relationship, production or skills challenges. The main objective of the study was to describe the supply chain challenges faced from the perspective of the assemblers and identify measures taken to overcome the challenging factors. The study raised three research questions that are answered as a result of the study. The target population covers all local vehicle assembling firms in Ethiopia. For the study descriptive type of research design was used, and quantitative and qualitative data was collected to collect information on challenges of the firms and measures taken to overcome the challenges from the respondents. Descriptive statistics was employed for the analysis of the data by using SPSS v 17 software and different secondary documents analysis is done for confirming the findings The result indicates technological and infrastructural challenges followed by cost challenges are found to be critical for the vehicle assembling firms in Ethiopia. In addition to this complicated LC opening procedures, the difference between bonded warehouse and customs working strategy, second hand imported vehicles, government policies and tax issues, the chance given by the government to investors to import cars without any tax due which affect the sales of locally assembled cars are also quoted by respondents as challenges. Even though measures have been taken by the assemblers to reduce challenges by using a systematic way of handling their customers, training their employees, using inbound logistics systems and discussing with concerned government officials the shortcomings cannot be reduced. This indicates most of the challenges are beyond the control of the firms, and need coordination between all the stakeholders for reducing the impact of these challenges for the growth of the industry.

Key words: Supply chain challenges, Ethiopia, Vehicle assembling firms.

CHAPTER ONE

INTRODUCTION

1.1Background of the study

Universally, the automotive industry has been accepted as a major driver of growth of a nation's economy and is a significant contributor to the global economy. The automobile has been described as 'both a form and function' based product involving high level of engineering as well as being positioned as a fashion product (Thomas.K, 2013). The industry has rightly been called as "the industry of industries", since it uses outputs of nearly all manufacturing industries and supports upstream (mining, steel etc) and downstream industries (finance, insurance, after – market etc), (AT Kearney, 2013).

Ethiopia, being one of the African countries, requires continuous improvement in agriculture, manufacturing and automobile sectors. In accomplishing the development on these sectors, the role of infrastructure is vital. The developments of the infrastructure in turn highly depend on the availability of various types of vehicles (cars, pickups, trucks etc...) construction machineries and agricultural equipment's, (Narasimha, Rejikumar, &. Sridhar, 2013).

Given the current limited disposable income, Ethiopia's automotive market is dominated by second-hand imported vehicles – particularly commercial vehicles. Due to Ethiopia's tax system, which subjects vehicles to tax depending on their engine size rather than age or origin, it is often cheaper to import a second-hand vehicle with a smaller engine size than it is to assemble a vehicle locally, despite import taxes on these vehicles. Ethiopia is subject to foreign exchange controls and exporters are given preferential access to foreign exchange. Insufficient availability of foreign exchange causes inefficiencies and planning challenges for importers of SKD kits, Fully Built-Up (FBU) units and parts (for assembly or repair) and inhibits the growth of the assembly and retail market, (Deloitte Africa Automotive Insights, 2016).

The Ethiopian Investment Commission (2015) reports that 31 foreign vehicle investment projects (largely Chinese projects but also some involvement of European companies) and 73 domestic

vehicle assembly investment projects have been licensed since 1998. This means that a total of 104 companies have been licensed for vehicle assembly in the country over the past two decades. However, only a few of these are operational, with the vast majority licensed at the pre-implementation stage. While actual production numbers are not available, a number of assemblers indicated that plants were not operating at full capacity due to the current limited market size and inadequate access to foreign exchange to cover imports of Semi Knocked-Down (SKD)kits.

The automotive industry is perceived to be the most advanced manufacturing industry practice in Ethiopia. Unlikely, these challenges hinder the efficient and effective supply chain practices by vehicle assemblers in Ethiopia. In light to this, the automotive industry is challenged to maintain its position in the market, to produce at a competitive cost and to have the ability to respond quickly and reliably to market demands.

Thus, this study explores the challenges facing supply chains of locally assembled vehicles in Ethiopia.

1.2 Statement of the problem

The manufacturing sector has been selected as a high priority sector by government. As a result, Ethiopia's economic policy, the second Growth and Transformation Plan (GTP II), aims to support and grow the manufacturing contribution to GDP from 4% in 2014 to 8% by 2020. This is supported by attracting investment through industrial parks and extending incentives, including tax incentives, to foreign investors, (Ethiopian Investment Commission, 2015).

According to the Kotler Marketing Group (2009), EMs (Equipment Manufacturer) are required to enhance quality, improve styling, increase organizational efficiencies and drive innovative features into their products in an effort to attract customers and expand into new markets. The industry is at the cutting edge and adopting new technologies. Pires and Neto (2008:328) assert that in recent years, the automotive industry has experienced strong competition on a global scale in highly competitive markets. From a worldwide perspective, it has been challenged to face issues such as: strong pressures for price and delivery time reductions; quality and overall

customer service improvements and environmentally friendly products; a substantial reduction in product life cycles and the rapid introduction of new products, with strong pressure to reduce the time-to-market and product development costs; the pressure to supply new markets; and the strengthening of relationships and intensification of communication channels in supply chains in general (Pires & Cardoza, 2007). These, imply that automotive manufacturers need to be flexible and responsive to customer demand in order to succeed.

The major problems observed based on the preliminary interviews with the local vehicle assemblers are in the areas of Government regulation and policy, tax inconsistency, domination of imported second hand vehicles, lack of adequate infrastructure, technologies and financing facilities, Inadequate foreign currencies, absence of Market Demand**.**

There are a few numbers of studies that have examined Automotive Industry practices in Ethiopia. For instance, (Desta, 2007) conducted a study on the automotive industry and trend analysis in Ethiopia, (M.Narasimha, *et al*.2013)focused on Analyzing automotive industry and its trend in strengthening the industry in Ethiopia.

However it's clear none of these studies indicated the extent to which supply chain challenges are felt by the local vehicle Assemblers. Hence the manufacturing sector did not show satisfactory growth though a major money contributor to the Ethiopian economy with respect to Job creation, saving foreign currency, attaining balance of import-export. The industry has fragilities and faces new and emerging supply chain challenges.

Most vehicle imports attract high tax rates but the Ethiopian Government does not levy any export duty on vehicles, (Ethiopia Revenue and Customs Authority, 2015).Hence there is need to conduct a study to determine what factors hinder the performance of the industry in order to recommend/suggest measures to be taken for accelerating the growth of the sector and thereby increasing the sector's contribution to the national economy.

1.3 Research Questions

In this regard, the purpose of this research is defined by the following research question:

- What are the supply chain challenges faced by local assemblers of vehicles in Ethiopia?
- What measures have been taken by the assemblers in order to reduce encountered challenges?
- Which factor is more challenging from each major group of challenges (cost, Market, Infrastructural, Technological, production/skill, Relationship)?

1.4. Objectives of the study

1.4.1 General Objective

The general objective of the study is to assess challenges of locally assembled vehicle supply chains in Ethiopia.

1.4.2 Specific Objectives

The specific objectives of the study are the following:-

1. To identify the most critical challenges in the supply chain of local vehicle assemblers in Ethiopia.
2. To determine measures taken by the assemblers in order to reduce encountered challenges.
3. To determine which factor is more challenging from each major group of challenges (cost, Market, Infrastructural, Technological, production/skill, Relationship).

1.5 Significance of the study

The findings of this research contribute to the body of knowledge as an indicator for future studies and reveals challenges that hinder the performance of local vehicle assemblers. In addition this study will assist the government to identify the loopholes in the existing laws and regulations hence making better policies on automotive industry.

1.6 Scope of the Study

Supply chain encompasses vast areas of managerial practices. However, it is difficult and unmanageable to conduct the study in all areas that summarizes all participants in terms of time, finance, geographical location and research manageability. The scope of this study is assessment of the existing supply chain challenges from the perspectives of local light vehicle assemblers. As the nature of the study mainly depends on the quantity and quality of the collected data, shortage of finance was a limitation to extend the research point of reference towards perspectives of all the SC participants namely: the suppliers and customers.

1.7 Definition of Terms

Supply chain

It is a set of synchronized activities for integrating suppliers, manufacturers, transporters, and customers efficiently so that the right product or service is delivered at the right quantities, at the right time, to the right places, (S. Chopra and P. Meindl, 2007).

Supply chain management

According to Leenders and Fearon:

Supply chain management is the systems approach to managing the entire flow of information, materials and services from the raw materials suppliers through factories and warehouses to the end customer (2004).

Automotive industry

An automobile (also motor car or simply car) is a wheeled passenger vehicle that carries its own motor. Most definitions of the term specify that automobiles are designed to run primarily on roads, to have seating for one to eight people, to typically have four wheels, and to be constructed principally for the transport of people rather than goods, (Federal Customs Authority,2006).

Automakers, also known as carmakers, automobile manufacturers, motor manufacturers, or the automobile industry are companies that design and manufacture automobiles. The automobile industry is dominated by relatively few large corporations. The biggest of these by annual production are Toyota, General Motors and Ford Motor Company in that order. The most

profitable per-unit car-maker of recent years has been Porsche due to its premium price tag, (Gnogno P. 2007).

1.8 Organization of the study

This thesis is organized with five chapters. The first chapter gives introductory view to the reader about the thesis work, what initiated it, the problem statement, objectives, scopes, significance, limitations and how the whole thesis is organized or structured.

Following this introductory chapter, the second chapter reviews the literature available in the area of supply chain challenges and practices in automotive industry. In other words this chapter holds theoretical and empirical evidences related to the study.

In the third chapter the research report covers different aspects of the research methods used and situations that the researchers must consider during each phase of the study. Different ways of carrying out a study and ways of collecting information is discussed.

The fourth chapter covers the result/finding and interpretation of the research questionnaires. The findings are presented with the help of statistical tools such as frequency and tables.

The last chapter presents the conclusions drawn from the study, and give recommendations. It also includes suggestions for further researches in the area.

CHAPTER TWO
LITERATURE REVIEW

2.1 Review of Theoretical Literature

This section contains review of theories and the conceptual framework. The section on review of theories explores the following theories based on the main research questions.

2.1.1 Supply chain

As Reid and sander (2011), the network of entities that is involved in producing and delivering a finished product to the final customer is called a supply chain… The objective is to have everyone in the chain work together to reduce overall cost and improve quality and service delivery.

As Matiwos (2013) supply chain is the network of facilities (warehouses, factories, terminals, ports, stores, and homes), vehicles (trucks, trains, planes, and ocean vessels), and logistics information systems (LIS) connected by an enterprises supplier's suppliers and its customer's customers.

Bartlett, Julien, Baines, (2007) also explored that supplier satisfaction and contribution lead to customer satisfaction and SCM performance. Matiwos, (2013) argue that Supply chain performance is now a distinct competitive advantage for companies who excel in this area. From the review we can see that all authors agree that excellence in supply chain will give distinctive competitive advantage for an organization.

As cited by Refu, (2006) Supply Chain of a company consists of an upstream supplier and downstream distribution channel. Depending on how complex the supply network is there are three types of Supply Chain, (Halldersson, A., Larson P. D. 2000).

1. Direct Supply Chain which consists of a company, a supplier, and a customer.
2. Extended Supply Chain which includes suppliers of immediate supplier as well as a customer of the immediate customer
3. Ultimate supply chain, which includes all the organization involved in all the upstream and downstream flows.

Supply Chain Management as a management philosophy takes a system approach to viewing the Supply Chain as a single entity. This means that the partnership concept is extended in to a multi-firm effort to manage the flow of goods from suppliers to the ultimate customer. Each firm in a Supply Chain directly or indirectly affects the performance of other Supply Chain members, as well as the overall performance of the Supply Chain, (Sengupta, K., D.R. Heiser, L.S. Cook., 2006).

2.1.2 The Objective of a Supply Chain

The objective of every supply chain should be to maximize the overall value generated. The *value* a supply chain generates is the difference between what the final product is worth to the customer and the costs the supply chain incurs in filling the customer's request. Effective *supply chain management* involves the management of supply chain assets and product, information, and fund flows to maximize total supply chain profitability, (S. Chopra and P. Meindl, 2007).

2.1.3 Supply Chain Management (SCM)

The concept of supply chain management has its roots in the 1960s concept of logistics management – a planning tool that seeks to develop a system–wide, integrated view of the firm. Subsequently, supply chain management extends the concept of logistics management to external integration of the firm. It is conceived as "a series of linked suppliers and customers", (Shay, 2000).

Application of SCM has also become a common practice across industries, since they address long-term strategic alliance, supplier-buyer partnerships, cross-organizational logistics management, joint planning and control of inventory, and information sharing. It has been also

considered as a major component of competitive strategies as effective SCM leads to lowering of the total amount of resources required to provide the necessary level of customer service to a specific market, and improving customer service through increased product availability and reduced order cycle time, (Banomyong & Supatn, 2011).

Supply Chain Management (SCM) aims at the efficient use and operations of supply chain assets, products, information and cash flows, (chopra & Meindl, 2006). The ultimate goal of an SCM process is to create customer and shareholder value, and it is thus often called a value delivery system. This goal can be achieved by using technology and teamwork to build efficient and effective processes that create value for the end customer,(Fawcett, Ellram, & Ogden, 2007).

The objective of supply chain management is to maximize the overall value generated, minimize the cost, effective and timely distribution of products needed by ultimate customers, (Matiwos, 2013).

2.1.4 Supply Chain Practices in the Automotive Industry

Today's manufacturing network, like the rest of the supply chain, has become more complex and geographically disparate. At the same time, there has been a major shift in the way end-consumers behave and buy products. Consumers have more control over the buying experience, with more ways to purchase than ever before, and more options from competing retailers and manufacturers. This has all resulted in increasing demand volatility a major concern of manufacturing companies. On the supply side, the complexity of supplier networks, manufacturing plants and distribution centers has also increased. This complexity makes it very difficult for manufacturers to respond quickly to changes or disruptions. Although volatility and disruptions are hard enough to manage, most organizations are also dealing with internal misalignment. Sales, marketing, engineering, operations, and finance departments all pursue separate goals that are, at times, at odds with one another. When manufacturers can't get stakeholders to quickly agree and act on the right path forward, and when supply network complexity makes it difficult to make changes on-the-fly, it simply takes too long to respond to changing consumer demands, (Razat Gaurav, Prashant Bhatia & Madhav Durbha , 2015).

The automotive industry is one of the most global industries, with its products spread around the world and dominated by small companies enjoying worldwide recognition, (Barnes & Morris 2008). In Ethiopia the development level of automobile industry in the country is low in comparison to other developing countries. There are various factors which contribute for hindrance of the sectors development. The main points are Government regulation, tax inconsistency, production output, shortage of road access, lack of foreign currency and finance for the purchase of trucks. The contribution of the automobile industry for the economy and employment creation is big compared with the investment outlay to the industry. Therefore attention to be paid in strengthening the Automobile industry is must. Upgrading the capacity in maintenance and servicing of automotives is important. Major decision to improve and enhance the operation of the automotive industry lies in the hands of Transport authority, which is believed to be staffed with under qualified personnel. Strengthening automotive industry is one of the ways to increase the growth of the national economy. (M. Narasimha, *et al.*2013).

The main drivers of new commercial vehicle sales are construction, agri-business and retail while passenger vehicle sales are driven by government (including diplomatic corps) purchases. Due to low disposable income, the absence of vehicle finance facilities and the ban of vehicle leasing schemes, personal vehicles remain out of reach for the majority of the population. Limited availability of foreign exchange to purchase imports also restrains access to vehicles. Commercial vehicles, such as pick-ups, vans and trucks, have a lower tax rate than vehicles for personal use. Relative disincentives exist vis-à-vis personal vehicles compared to commercial vehicles. Diplomats and foreign investors are allowed to import vehicles duty-free. The supply-depressing character of foreign exchange shortages contributes to imbalances in the market and drives up the market price of vehicles, thus also having a negative impact on the affordability of vehicles in the Ethiopian market, (Deloitte Africa Automotive Insights, 2016).

2.1.5 Supply Chain Macro Processes in a Firm

According to Chopra and Meindl (2007), all supply chain processes can be classified into the following three macro processes

1. **Customer Relationship Management (CRM):** All processes that focus on the interface between the firm and its customers.

2. Internal supply chain management (SCM): All processes that is internal to the firm

3. Supplier Relationship Management (SRM): All processes that focus on the interface between the firm and its suppliers.

The three macro processes manage the flow of information, product, and funds required to generate, receive, and fulfill a customer request. The CRM macro process aims to generate customer demand and facilitate the placement and tracking of orders. It includes processes such as marketing, pricing, sales, order management, and call center management. The ISCM macro process aims to fulfill demand generated by the CRM process in a timely manner and at the lowest possible cost. ISCM processes include the planning of internal production and storage capacity, preparation of demand and supply plans, and fulfillment of actual orders. The SRM macro process aims to arrange for and manage supply sources for various goods and services. SRM processes include the evaluation and selection of suppliers, negotiation of supply terms, and communication regarding new products and orders with suppliers, (Chopra and Meindl 2007)

Table 1: Supply chain processes

Supplier	Firm	Customer
SRM	ISCM	CRM
Source	Strategic Planning	Price
Negotiate	Demand Planning	Sell
Buy	Fulfillment	Call Center
Design Collaboration	Field Service	Order Management
Supply Collaboration	Supply Planning	Market

Within a firm, all supply chain activities belong to one of the three macro processes: CRM, SRM, and ISCM. Integration among the three macro processes is crucial for a successful supply chain management.

2.1.6 Why focus on the macro processes?

As the performance of an enterprise becomes more closely linked to the performance of its supply chain, it is crucial that firms focus on these macro processes. After decades of focusing on internal processes, a firm must expand the scope beyond internal processes and look at the entire supply chain to achieve breakthrough performance. As discussed, the goal should be to increase the total profitability of the supply chain (also referred to as the supply chain surplus), (Chopra and. Meindl 2007).

Effective supply chain management requires simultaneous improvements in both customer service levels and the internal operating efficiencies of the companies in the supply chain. Customer service at its most basic level means consistently high order fill rates, high on-time delivery rates, and a very low rate of products returned by customers for whatever reason. Internal efficiency for organizations in a supply chain means that these organizations get an attractive rate of return on their investments in inventory and other assets and those they find ways to lower their operating and sales expenses, (Matiwos, 2013).

2.1.7 Challenges of Supply Chain

According to (Razat Gaurav, *et.al* 2015), there are four key supply chain challenges that a company must overcome.

(1) Demand uncertainty and volatility. Markets continue to be disrupted by product innovation, the rise of private-label products, and rapidly growing emerging economies. Added to these events such as the global economic downturn, earthquakes, hurricanes, and geopolitical instability contribute to demand volatility.

(2) Globalization**.** To capture demand in emerging economies, companies have scrambled to open channels and form joint ventures. At the same time, they have moved rapidly to develop supply capabilities from the same low cost countries. This has led to a complex mishmash of channels downstream and supply capabilities upstream. As a result, companies are struggling to achieve end-to-end visibility, optimize production and inventory assets, and continuously synchronize their downstream channels and upstream supply. The continued globalization of supply and demand has also increased the level of risk inherent in the supply chain.

(3) Escalating consumer expectations**.** Consumers have grown to expect a consistent and seamless shopping experience, regardless of whether they're connecting with a retailer via store, website, catalog, mobile phone, or social media (or even buying directly from the manufacturer). Companies that can't meet these expectations are losing customers as a result.

(4) New product introductions. In most industries, continuous product innovation is critical to success. This is particularly true in short life cycle industries such as consumer electronics, but is also important to longer life cycle industries such as automotive, industrial, and consumer packaged goods. If not handled well, product introductions can create problems.

Chopra *et.al* (2007) classified supply chain problems into three levels

(1) Competitive strategy such as location allocation decisions, demand planning, distribution channel planning, outsourcing, supplier selection, enabling information technology selection

(2) Tactical planning such as inventory control, order consolidation, production /distribution coordination, and

(3) Operation routines such as production shop floor scheduling, fleet scheduling, work force scheduling.

Since there is no standard questionnaire that will rate all the selected supply chain challenges, the questionnaire is prepared by referring different related studies, and to increase validity of the instrument the questionnaire is based on preliminary interviews with some of the respondents that have adequate knowledge on the subject. Using the expert views and suggestions, the final questionnaire was prepared and distributed to the respondent firms. In this regard the challenges are grouped into technological challenges, infrastructural challenges, cost challenges, market or service challenges, relationship challenges and skills challenges.

2.2 Summary

Review of literature has indicated that there are a lot of problems facing the motor vehicle industry. These issues, objective of supply chain, supply chain processes and supply chain challenges. All the above issues have been reviewed expansively. The findings clearly emphasize the importance of addressing supply chain problem at country and organizational level.

2.3 Empirical review

This section presents the assessment of researches conducted on challenges of automotive industry. The following research papers which were conducted in other developed and developing nations are selected because of their similarity to the current study.

A study which was conducted by Micheline Juliana (2013) on supply chain challenges in the South African automotive sector with the objective of exploring the supply chain challenges of South African ACMs (automotive component manufacturers} face and whether the location, size

and age of participating ACMs have a bearing on whether they face the same challenges. Accordingly, the study revealed that the most significant supply chain challenges in South Africa were in the customer relationship category. From the hypotheses testing, the conclusion is drawn that, in general, participating ACMs face common supply chain challenges, irrespective of their location, age and size. More to this, the study identified the role of ACMs in the competitiveness and the survival of the automotive industry is vital, as ACMs are the main contributors to employment in the automotive industry and they can make a great contribution to the cost competitiveness of the South African automotive industry. In addition automotive assembly plants in South Africa have to import too many parts as there is a lack of local suppliers in the market, and this presents an opportunity for trade with aspiring entrepreneurs.

The study tries to identify supply chain challenges in the South African automotive sector. Since its scope was to study South African automotive sector it should have included all listed participants in the automotive industry or indicate the reason behind. only component manufacturers who are members of NAACAM (National Association of Automotive Component and Allied Manufacturers) were included in the study and therefore the findings cannot be generalized to all ACMs in South Africa; and secondly, the focus was on the challenges experienced at one stage of the supply chain (at ACMs) and are judged from the ACMs' viewpoint.

Another study conducted by Ambe & Badenhorst (2013) on Challenges of locally manufactured vehicle supply chains in South Africa tries to identify the supply chain challenges faced by vehicle manufacturers of locally manufactured models in South Africa and also determine if there is a difference between supply chain challenges faced by manufacturers of different origins in South Africa. From the findings of the study there was not much perceived difference in supply chain challenges between the different parent companies of origin in South Africa, except for three challenges which are unreliability of rail transport, adequacy of information systems and labor problems. The study further indicates that locally manufactured vehicle supply chains are particularly challenged by: cost to update technology, inefficiencies at ports, fuel price and port charges, improving service levels, cancelling of orders, capacity, skills and labor disputes. Based on the findings the researcher recommended that there is a need to improve service levels and to explore new and emerging markets for exports. If consumer fulfillments are attained as

first priority, then the industry will have to work even harder to provide the demanding millennium customers with the level of service they expect.

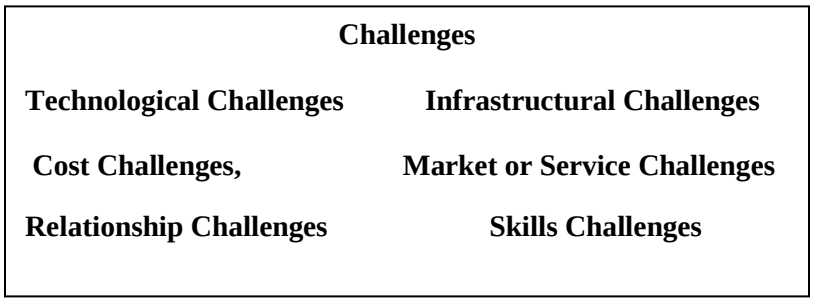
The study identified locally manufactured vehicle supply chains in South Africa but the study used purposive sampling method which is subjected to bias, and could not draw conclusion for the total population. And there was no justification behind the total target population the researcher simply selects six light vehicle manufacturers from the industry.

In addition to this another study conducted by Nixon oduor (2013) titled Operations strategy and performance among motor vehicle assemblers in Kenya study sought to survey the operations strategies of the motor vehicle assembly industry in Kenya and What challenges are faced by motor vehicle assembly industry in implementation of operations. Accordingly, the study revealed that the most significant challenges in the industry are the importation of the second hand vehicles from overseas. Other challenges include increased competition, unfriendly policies and regulations, long lead times, delivery constraints, strained distribution and marketing networks, poor infrastructure, heavy inventory costs, unreliable suppliers and high cost of credit. Based on the findings the study recommends that management of the company's to focus more on the strategies of cost, reliability and quality to achieve higher levels of performance.

In general, there have been a number of valuable studies of the supply chain in different sectors and countries. According to the literature, a lot of studies have attempted to explore supply chain challenges of the vehicle assemblers and manufacturers. However, to the best of the researcher's knowledge no study has been done yet locally on the challenges of local vehicle assemblers supply chains in Ethiopia and this study can be generalized to all light vehicle assemblers in Ethiopia.

2.4 Conceptual Framework

Figure 1: Conceptual framework



Source: The Researcher.

As indicated in the diagram of the conceptual frame work, the study is highly focused on the challenges in the supply chain using the six categories. This study is not limited in its scope and tried to identify the general supply chain challenges using different categories like technological, infrastructural, cost, market or Service, relationship, skills challenges and it presented the critical ones that need immediate action.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the methodology that is used to obtain answers to the research questions in chapter one. This section include: research design, description of the study area, research approach, population of the study, data collection tools and unit of analysis.

3.2 Research Approach

The purpose of this study is to analyze challenges faced by local light vehicle assemblers. After reviewing literature and identifying the problems and challenges it is necessary to reveal practical problems and challenges in reality. Therefore both qualitative and quantitative research methods are applicable. Bryman and Bell (2007) defines that quantitative research is a distinctive research strategy that emphasizes quantification in the collection and analysis of data. It can be described as entailing the collection of numerical data and as exhibiting a view of the relationship between theory and research, in which the purpose is the testing of said theories. The goal of the quantitative method is to add to the body of knowledge through building formal theory which explains the phenomenon (Bryman & Bell, 2007).

In qualitative research, a large amount of information and data is often gathered, in many cases a surplus of information is collected (Hardy & Bryman, 2004). Qualitative research work is being performed when data that is not expressed in numbers is gathered, interpreted and analyzed. In this thesis, the data gathered from open-ended responses were used to give more meaning to the respondents' views on questions where it was applicable. (Gray, Williamson, Karp & Dalphin 2007).

3.3 Research Design

The study used a descriptive type of research design, this design is selected because it helps to discover and describe the characteristics of the variables or issue conducted through questionnaires. Descriptive studies observe, describe and document aspects of a situation as it naturally occur, (Polit and Hungler,1999).Descriptive research design will assist to explain the

challenges encountered by firms assembling vehicles in Ethiopia. The descriptive survey design was deemed appropriate for the study because it is versatile and practical, in that, it identifies present conditions and points to recent needs. Moreover, it would make it much easier to survey, interpret, synthesize, and integrate data in a bid to examine the implications and interrelationships identified in the study. The choice of this design was further motivated by the fact that descriptive research or survey aims mainly at describing, observing and documenting aspects of a situation that naturally occurs (Polit and Hungler, 1995).

3.4 Unit of Analysis

The unit of analysis for this study is all local light vehicle assembling firms in Ethiopia. It is due to the fact that local vehicle assembling firms supply chain is challenged by many factors so that, the analysis is made at these firms' level.

3.5 Population of the Study

The target population consist all vehicle assemblers in Ethiopia that produce locally made light vehicles. These assemblers are the most important and powerful players in locally produced vehicle supply chains. According to the Ethiopian Investment Commission (EIC) a total of 104 companies have been licensed for vehicle assembly in the country over the past two decades. However, only a few of these are operational. According to In-market interviews and company websites there are **five vehicle assembly plants** which are Yangfan motors, Nigma motors Belayab motors, Mesfin industrial engineering and Betret motor engineering operating in Ethiopia who formed the population of this study. A census of all the assemblers in the automotive industry is conducted.

3.6 Sampling of the study

Because the total population is finite and small in number, the study does cover all the total population of the study and sampling technique is not applied.

However, the respondents that represent the company are selected using purposive sampling, and those are departments that are well aware of the supply chain and easily observed the related challenges. Therefore, Three respondents from each manufacturer departments, namely: Procurement and or Supply Chain Department, Manufacturing Department, Marketing and sales

Department. Regular cross checking and follow-ups had also made at the time of data collection to ensure accuracy, relevance, completeness, consistency and uniformity of the data.

3.7 Data Collection Tools

Generally source of data is classified as primary and secondary based on who collected it.

Data collected by the researchers themselves through various data-gathering methods are defined as primary data,(Ghauri & Gronhaug,2005).

The primary data in this study is collected through; Questioners. The draft questionnaire was modified from a readymade questionnaire that Ambe, I.M. & Badenhorst- Wess, J.A., (2013) used in their study on Investigation on Challenges of locally manufactured vehicle supply chain in South Africa. Moreover it was modified considering the preliminary interviews made with the respondents and literature review. Therefore, semi-structured questionnaire is used as the main tool for collecting primary data and was guided by the objectives of the study, data to be collected.

The secondary data rely on previous data collection and are thus not a first-hand source. Many researchers recommend that secondary data should be the starting point of all research, (Ghauri and Gronhaug, 2005).

In this study secondary data were collected from company website, books, research papers and articles.

3.8 Data Analysis

The study collected both qualitative and quantitative data, and therefore, data was analyzed according to its type.

For the analysis of the quantitative data descriptive statistics supported by SPSS software version 17.0 was applied, and for qualitative data document analysis was done. The open-ended responses are used to give more meaning to the respondents' views on questions where it is applicable.

Generally, data presentation and interpretation was made using tables in order to display the collected data in a concise and meaningful way. The data are finally interpreted based on statistical findings.

3.9 Validity & Reliability

Validity: In order to ensure the quality of this research design content of the research instrument were checked .The content validity was verified by the advisor of this research who looks in to the appropriateness of questions and the scales of measurement. Preliminary interview with some of the respondents was also conducted since it is another way of checking the appropriateness of questions. This was done to find out whether the developed instruments measures what it was meant to measure and also to check the clarity, length, structure and wording of the questions. This test also helped the researcher to get valuable comments to modify some questions. These activities enable the questionnaire to have reliability and validity.

Reliability: The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability. According to Zikmud et al (2010) cronbach's alpha is a measure for the internal consistency of items to the concept. Scales with coefficient alpha between 0.8 and 0.95 are considered to have very good reliability, scales with coefficient alpha between 0.7 and 0.8 are considered to have good reliability and coefficient alpha between 0.6 and 0.7 indicates fair reliability.

Table 2: Cronbach's alpha

Dimensions of supply chain challenges	**Cronbach's alpha result**
Technological challenges	.915
Infrastructural challenges	.884
Cost challenges	.727
Market or service challenges	.780
Relationship challenges	.896
Production and skills challenges	.815

3.10 Ethical Consideration

Welman, Kruger and Mitchell, (2005) as cited in Tamirat Gezahegn, (2013) explain that ethical considerations and ethical behavior are as important in research as they are in any other field of human activity. The information collected from firms is going to be kept confidentially in order to keep their ethical value. Institutional secured data like financial statements were not required for the analysis, and this in turn encouraged the firm representatives to freely respond for the items under study.

CHAPTER 4

Result, Discussion and Interpretation

4.1 Introduction

The data obtained from the primary source using semi-structured questionnaires and secondary data are presented. The 45 questionnaire were distributed to the local light vehicle manufacturing firms, each getting 9 questionnaires. From this 5 firms have completed and returned the questionnaire, while 2 firms did not complete the questionnaires, explicitly 40 out of 45 questionnaires are collected. This indicated that the response rate was 88.88 %. Therefore, the response rate found is very good for further analysis of the data. Generally, findings of the study is presented to answer the leading research questions, and the marketing, production and supply chain departments were the main sources of data.

4.2 Analysis of the Respondents' Profile

The demographic profile of the sample respondents is presented and analyzed below. The purpose of assessing respondents' profile is that, to determine whether the study considered heterogeneity of sample units. On the other hand assessing the work experience and education level of the respondents' is that, when the respondents are more experienced and educated they have better opportunity to understand the case and give better response than else.

4.2.1 Gender of the respondents

TABLE 4.1:Gender of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Female**	9	22.5	22.5	22.5
	Male	31	77.5	77.5	100.0
	Total	40	100.0	100.0	

Source: Own Survey, 2017

The figures in table 4.1 shows from the total of 40 respondents that, 9 respondents (22.5%) are female and 31 respondents (77.5%) are males. Therefore this indicates more than 50% of the respondents are male.

4.2.2 Summary of Age of the respondents

TABLE 4.2:Age of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**18-25**	5	12.5	12.5	12.5
	26-35	19	47.5	47.5	60.0
	36-45	10	25.0	25.0	85.0
	46-55	4	10.0	10.0	95.0
	56 and above	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

Source: Own Survey, 2017

Table 4.2 indicates that among 45 respondents, 24 respondents (60%) are above 18 to 35 years of age and 16 respondents (40%) are above 36 years of age. This result indicates most of the respondents are matured.

4.2.3 Summary of work experience of the respondents

TABLE 4.3: Work experience of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0-5**	24	60.0	60.0	60.0
	6-10	10	25.0	25.0	85.0
	11-15	2	5.0	5.0	90.0
	16-20	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own Survey, 2017

In terms of years in the firm, more than half of the total organization (60%) had experience in the sector less than 5 years, whereas (40%) of the respondent worked for 6 to 10 years , more than 11 to 15 years and 16 to 20 years respectively.

All of the respondents either have direct or indirect involvement in supply chain flows. Therefore, these indicate majority of respondents are experienced enough and sufficiently knowledgeable about the challenges in their firm.

4.2.4 Summary of Level of Education of the respondents

TABLE 4.4: Level of Education of the Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**below diploma**	2	5.0	5.0	5.0
	Degree	34	85.0	85.0	90.0
	Masters	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own Survey, 2017

Among the 45 respondents,(5%) below diploma, (85%) hold bachelor degree in the academic qualification and (10%) Masters degree. The result shows that most of respondents furthered their study at higher level. Which indicates the respondents can understand their firm's challenges in the supply chain.

4.3 Challenges experienced in locally-produced light vehicle supply chains

The respondents were asked to select what they believe is a supply chain challenge, and the percentage and average of each category of supply chain challenges are calculated and presented as follows.

4.3.1 Technological Challenges

Table 4.5: Summary of Responses of respondent's level of technological challenges

Technological Challenges	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
Inadequate information system	5	15	17.5	52.5	10
Electric power shortage	5	10	5	57.5	22.5
Inefficient planning and forecasting tool.	2.5	15	7.5	42.5	32.5
Costly to replace outdated assembly or manufacturing tools.	5	7.5	20	42.5	25
Average	**4.375**	**11.87**	**12.5**	**48.75**	**22.5**

Source: Own Survey, 2017

The above table 4.5 indicate the majority of the respondents agree with the statement about 'Electric power shortage' (80%), 'Inefficient planning and forecasting tool' (75%) and 'Costly to replace outdated assembly or manufacturing tools' (67.5%), 'Inadequate information system'(62.5%) . A total of (15%), (17.5%), (12.5%) and (20%) of the respondents respectively felt that these issues were not a potential challenge. The results reveal that the critical challenges in this category is related to Electric power shortage, inefficient planning and forecasting tool and Cost of replacing outdated assembly or manufacturing tool.

On average the result shows most of the respondents (71.25%) agreed technological challenges are incurred in their firm. While only (16.24%) disagreed. This indicates most challenging factors are related to technological challenge.

4.3.2 Infrastructural challenges

Table 4.6 Summary of Responses of respondent's level of infrastructural challenges

Infrastructural Challenges	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
Lack of sustainable infrastructure	7.5	30	12.5	32.5	17.5
Unreliable road transport	5	10	7.5	42.5	35
Road capacity problems	7.5	10	12.5	35	35
Increased road freight volumes	7.5	2.5	52.5	22.5	15
Delays at ports.	0.0	12.5	10	42.5	35
Average	**5.5**	**13**	**19**	**35**	**27.5**

Source: Own Survey, 2017

The findings with regard to infrastructural challenges from the above Table 4.6 indicated distributed responses, with (12.5%) of the respondents indicating that they were not sure if 'sustainable infrastructure' is a challenge; (37.5%) disagreed, whilst (50%) agreed that it is a challenge. 'Delays at ports.' was a major potential challenge according to (77.5%) of the respondents. However, a quarter (10%) of the respondents noted that they were unsure if it was a challenge and 12.5% disagreed. In terms of 'road capacity problems' encountered, (70%) of the respondents agreed that it is a challenge and (17.5%) of the respondents asserted that it was not a challenge, whilst the other respondents (12.5%) were unsure. In terms of 'Increased road freight volume' encountered, (37.5%) agreed that it is a challenge, (52.5%) were neutral, (10%) disagreed. Nonetheless, there were some cases where respondents were not sure if it was a challenge or not, such as 'Increased freight volume' (52.5%). This could be due to the fact that the respondents do not have an opinion.

On average (62.5%) of the respondents agreed with most of the infrastructural challenges and (18.5%) disagreed. This shows that infrastructural challenge is challenging for the manufacturing firms next to technological challenges.

4.3.3 Cost challenges

Table 4.7 Summary of Responses of respondent's level of cost challenges

Cost Challenges	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
High fuel costs affect our operating costs	5	25	37.5	12.5	20
Operating costs are high	15	35	12.5	25	12.5
Costs at ports are high	0.0	7.5	17.5	45	30
The prices of materials or components are high	2.5	2.5	10	35	50
Average	**5.6**	**17.5**	**19.37**	**29.37**	**28.12**

Source: Own Survey, 2017

The above table 4.7 indicated that 'High price of materials or components' is a major challenge since (85%) of the respondents agreed, However (10%) the respondents are unsure if it is a challenge, and only (5%) of the respondents disagree. In terms of 'Operating cost' (50%) of the respondents disagree if it's a challenge and only (37.5%) agreed. This result also shows that 'Costs at port' is also high as (75%) of the respondents agreed and only (5%) of the respondents disagree.

The average analysis made indicates (71.25%) agreed to cost challenges, (23.1%) disagree. This indicates most of the challenging factors next to infrastructural challenges are in cost challenges.

4.3.4 Market and Service challenges

Table 4.8 Summary of Responses of respondent's level of Market and Service challenges

Market and Service Challenges	SD (%)	D (%)	N (%)	A (%)	SA (%)
It is difficult to find a new market	17.5	25	12.5	27.5	17.5
Fluctuating demand	7.5	27.5	10	27.5	27.5
our customers cancel their order	25	37.5	17.5	15	5
We are challenged to improve our service level	15	35	15	27.5	7.5
Average	**16.25**	**31.25**	**13.75**	**24.37**	**14.37**

Source: Own Survey, 2017

Market and service challenges include issues that relate to finding new markets, cancellation of customer orders and improving service levels. The results in Table 4.8 indicate that 'Fluctuating demand' is selected by most of the respondents in this category (55%).while (35%) of the respondents disagree. In addition to this 'Our customers cancel orders' and 'challenge of improving service level' were not critical challenge as indicated by (62.5%) and (50%) of respondents respectively. 'Difficulty of finding new market' is the second challenging factor selected by (45%) respondents as a potential challenge. The results reveal that most of the challenges in market and service are related to fluctuating demand and difficulty of finding new markets.

From the computed average it is clear that most of the challenges mentioned on market and service challenge is not a critical challenge for the manufacturers. Since, most of the respondents (47.5%) disagree and only (38.72%) agree with the market and service challenges.

4.3.5 Relationship challenges

Table 4.9 Summary of Responses of respondent's level of Relationship challenges

Relationship Challenges	SD (%)	D (%)	N (%)	A (%)	SA (%)
It is difficult to collaborate with our strategic suppliers	5	20	12.5	40	22.5
It is difficult to collaborate with our strategic customers	7.5	20	20	40	12.5
We operate with a low level of collaboration	17.5	35	22.5	20	5
Average	**10**	**25**	**18.4**	**33.3**	**13.3**

Source: Own Survey, 2017

The above table 4.9 shows the majority of the respondents agree with the statement 'It is Difficult to collaborate with strategic suppliers' (62.5%). However 'we operate with low level of collaboration' is a challenge for only (25%) of the respondents. This shows that it is not a critical challenge. In terms of 'It is difficult to collaborate with our strategic customers' (52.5%) respondents agreed and (27.5%) disagree. So from this category manufacturers are faced with major challenges of difficulty in collaborating with strategic suppliers and difficulty to collaborate with their strategic customers.

On average (46.6%) of the respondents agree on the stated relationship challenges and (35%) of the respondents disagree. This implies challenges mentioned in relationship challenge are challenging to the manufacturers next to production and skill challenges.

4.3.6 Production and skills challenges

Table 4.10 Summary of Responses of respondent's level of Production and skills Challenges

Production and skills Challenges	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
It's difficult to introduce new products	20	32.5	7.5	32.5	7.5
Lack of capacity in repair and maintenance	12.5	17.5	15	37.5	17.5
Lack of adequate bank finance	2.5	12.5	17.5	30	37.5
Challenged by lack of skills	20	35	7.5	30	7.5
Challenged by labor problems	27.5	27.5	17.5	17.5	10
Challenged by Limited availability of foreign exchange	0.0	5	2.5	25	67.5
Average	**13.75**	**21.66**	**11.25**	**28.75**	**24.58**

Source: Own Survey, 2017

In terms of production or skills challenges, the results show that 'lack of skill', 'labor problems' (55%), and 'difficulty of introducing new products' (52.5%) were not a potential challenge indicated by most of the respondents. The responses for 'Lack of capacity in repair and maintenance' were dispersed, with (55%) of the respondents asserting that it is a challenge, (15%) of the respondents neither agreeing nor disagreeing and (30%) of the respondents disagreeing. The challenge of 'limited availability of foreign exchange' and 'lack of adequate bank finance' recorded a high agreement rating (92.5%) and (67.5%) respectively. whilst only (30%) and (5%) felt that it was not a challenge.

According to the results, foreign exchange shortage and inadequate bank finance are critical challenges that impact the performance of local automotive manufacturers in terms of production and skills challenges. In addition to this on average (53.33%) of the respondents agree, (35.41%) disagree with production and skill challenges. This indicates this category is challenging after cost challenges.

The Respondents were also requested to state other critical challenges that were not listed and measures taken in their firm to overcome the stated challenges. The result is summarized as follows:-In addition to the listed supply chain challenges complicated LC opening procedures, the difference between bonded warehouse and customs working strategy, government policies and tax issues, second hand imported vehicles, the chance given by the government to investors to import cars without any tax due which affect the sales of locally assembled cars are also quoted by respondents as challenges. To reduce these challenges some measures taken as stated by the respondents are using of a systematic way of handling customers, training their employees, using inbound logistics systems and discussing with concerned government officials in order to reduce storage cost, labor, transportation and maintenance cost.

CHAPTER 5

Summary of major Findings, Conclusion and Recommendations

5.1 Summary of findings

- In conclusion, the findings show locally assembled vehicle supply chains are particularly challenged by: Technological challenges of supply chain Electric power shortage and inefficient planning Cost of replacing outdated assembly or manufacturing tool and forecasting tool. In addition to this The results also show that efficient planning and forecasting tool is not highly utilized by the majority of the local manufacturers in the Ethiopian automotive industry.

- The findings from Infrastructural Challenges reveal that 'Unreliable road transport' and 'Delay at port' are serious challenges that impact the performance of local manufacturers in Ethiopia. The results confirm the findings of the (M. Debela, 2013); there are infrastructural challenges in Ethiopia and Ethiopian government, as the infrastructure provider, better invest the limited resources prudently on road, railway, dry ports and terminal infrastructures in line with intermodal transport requirements.

- According to the results cost challenges which include, high price of materials and components and costs at port highly affect the performance of the industry and its competitive position. This confirms reports of World Bank published in 2010 states that Logistics performance index: Overall (1=low to 5=high) in Ethiopia were 2.41 in 2009. Logistics Performance Index overall score reflects perceptions of a country's logistics based on efficiency of customs clearance process, quality of trade and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee within the scheduled time.(M. Debela, 2013). The statement asserted there is low logistics performance index, which leads to high costs at port which results high price of materials and components to manufacture new vehicles.

- From Market and Service Challenges fluctuating demand and difficulty of finding new markets are critical challenges. This confirms report by Addis Fortune, (2015) mentioning that Ethiopian vehicle assemblers are facing critical challenges like dominance of imported second hand cars which makes it hard to get high demand. Which is due to durability of locally assembled cars is shorter. A 10-year old car imported from Japan would be in better condition than a new locally assembled car and their spare parts are not easily accessible except by the assemblers themselves. Such problems affect the resale value of the cars. The majority of these are second-hand vehicles. Each year, 2 000 new Toyotas and between 5 000 and 7 000 used Toyotas are imported. In total, Toyota controls approximately 65% of the total market (new and second-hand) due to its reputation as being reliable and inexpensive to maintain, (Deloitte Africa Automotive Insights, 2016).

- This result from relationship challenges shows collaboration with suppliers and customers is a major challenge in the assembling firms and confirms the findings of (Razat Gaurav, Prashant Bhatia & Madhav Durbha , 2015) that on the supply side, the complexity of supplier networks, manufacturing plants and distribution centers has also increased. This complexity makes it very difficult for manufacturers to collaborate and respond quickly to changes or disruptions. Although volatility and disruptions are hard enough to manage, most organizations are also dealing with internal misalignment. Sales, marketing, engineering, operations, and finance departments all pursue separate goals that are, at times, at odds with one another. When manufacturers can't get stakeholders to quickly agree and act on the right path forward, and when supply network complexity makes it difficult to make changes on-the-fly, it simply takes too long to respond to changing consumer demands.

- The findings from production and skill challenges builds on the findings of (Deloitte Africa Automotive Insights, 2016) asserted that the local vehicle assemblers experience capacity limitations due to the reason that Ethiopia is subject to foreign exchange controls and exporters are given preferential access to foreign exchange. Insufficient availability of foreign exchange causes inefficiencies and planning Challenges for importers of SKD

kits, Fully Built-Up (FBU) units and parts (for assembly or repair) and inhibits the growth of the assembly and retail market. To overcome the limited supply of foreign exchange available to automotive producer's policy interventions and cooperation between government and private sector players would be required.

- In general the results show most of the challenges of supply chain for the firms are found under the category of technological and infrastructural challenges followed by cost, Production and skill, relationship, market and service challenges.

- The results show complicated LC opening procedures, the difference between bonded warehouse and customs working strategy, second hand imported vehicles, government policies and tax issues, the chance given by the government to investors to import cars without any tax due which affect the sales of locally assembled cars are also quoted by respondents as challenges.

- To reduce these challenges some measures taken as stated by the respondents are using of a systematic way of handling customers, training employees, using inbound logistics systems and discussing with concerned government officials.

5.2 Conclusions

- The study concludes that motor vehicle assemblers in Ethiopia face stiff challenges within the industry which has increased pressure on the manufacturers to find means to remain competitive**.**

- The findings indicate that most of the supply chain challenges are highly concentrated around custom procedures and are more of legislative issues. This also signifies that most of the challenges are beyond the control of the firms, and need coordination between all the stakeholders for reducing the impact of these challenges.

- To overcome the limited supply of foreign exchange available to automotive producer's policy interventions and cooperation between government and private sector players would be required. Nevertheless the car assembly companies claim that the support from the government is not satisfactory. Exchange rate variability and shortage is one of the drawbacks that holds the assemblers back and the profit margin of the locally assembled cars was lower compared to that of imported car. Addis Fortune report, (2015).

- The management and policy makers should understand and emphasis the need to overcome the challenges for the success of the vehicle manufacturing sector which saves substantial amount of foreign currency compared to import of used vehicles.

- In the globalization world only producing quality vehicles is not a guarantee to be competitive. So the assemblers should consider building mutual relationship with suppliers and customers, making the custom processes efficient, using information technology and having reliable transportation systems are among the other factors that contribute for creation of stable environment.

5.3 Recommendations

- The motor vehicles companies found to be experiencing unfriendly policies and regulations in their business environment which in turn affects their performance. The study recommends that the government should review the policies and the regulations in place with a view of making them friendly to the local motor vehicle assemblers.

- The study found that motor vehicle assemblers experience challenges from the second hand imported vehicles. It is recommended that the government introduces high levies on the imported second hand vehicles to protect the local companies from unfair competition and also offer incentives to make locally assembled vehicles affordable.

- The assemblers need to increase the durability of locally assembled cars and make their spare parts easily accessible and have their samples physically and technically inspected before fully going into manufacturing and sales.

- The government should create a mechanism to secure accessories and components supply from domestic manufacturing , and work closely with the assemblers so as to solve their problems and enable transformation of technology which in turn reduces higher dependency on outside suppliers and reduce foreign currency explicitly import substitution.

- The government should apply tax measures based on year of make rather than engine capacity to make older vehicles more expensive and encourage new vehicles and Ban used vehicles imports on the basis of health, age and emissions grounds.

5.4. Suggestions for further study

For future research studying the supply chain challenges by expanding the scope i.e. by including the stakeholders of these firms like Ministry of Transport, suppliers and customs office, etc. is recommended.

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APPENDIX 1

ADDIS ABABA UNIVERSITY

College of Business & Economics, School of Commerce.

QUESTIONNAIRE

Dear Participants;

This questionnaire is developed for an academic effort planned for the collection of data to conduct a thesis paper on the title "**Challenges of locally assembled vehicle supply Chains in Ethiopia: assemblers perspective"** in order to fulfill the University's (Addis Ababa University) requirement set for awarding of a Masters Degree in Logistics and Supply Chain Management. The information obtained from this questionnaire will be kept confidential and will not be used for any other purposes. Hence, I am kindly asking respondents to give your candid information.

Thank you for your cooperation!

PART ONE: GENERAL INFORMATION

a. Gender

Male ☐ **Female** ☐

b. age

18-25 ☐ **26-35** ☐ **36-45** ☐ **46-55** ☐ **56 and above** ☐

c. Company name_____

d. Company address_____

e. Your current position_____

f. Highest Qualification_____

g. Your work experience in this company in year _____

SECTION TWO: CHALLENGES EXPERIENCED IN LOCALLY-PRODUCED LIGHT VEHICLE SUPPLY CHAINS.

4. Identify the extent to which the following supply chain challenges faced by local vehicle assemblers.

Using the following Rating Scales under the columns, circle only one number from the given numbers after reading the variable on the left hand.

The questions in **Part 1**represent: **Challenges experienced in locally-produced light vehicle supply chains. 1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-agree and 5-Strongly agree**

Part 1: Challenges experienced in locally-produced light vehicle supply chains.					
	SD	**D**	**N**	**A**	**SA**
Technological challenges					
Inadequate information systems.	1	2	3	4	5
Electric power shortage	1	2	3	4	5
Inefficient planning and forecasting tool.	1	2	3	4	5
Costly to replace outdated assembly or manufacturing tools.	1	2	3	4	5
Infrastructural challenges					
Lack of sustainable infrastructure	1	2	3	4	5
Unreliable road transport	1	2	3	4	5
Road capacity problems	1	2	3	4	5
Increased road freight volumes	1	2	3	4	5
Delays at ports.	1	2	3	4	5
Cost challenges					
High fuel costs affect our operating costs	1	2	3	4	5
Operating costs are high	1	2	3	4	5
Costs at ports are high	1	2	3	4	5
The prices of materials or components are high	1	2	3	4	5
Market or service challenges					
It is difficult to find a new market	1	2	3	4	5
Fluctuating demand	1	2	3	4	5
our customers cancel their order	1	2	3	4	5
We are challenged to improve our service level	1	2	3	4	5
Relationship challenges					
It is difficult to collaborate with our strategic suppliers	1	2	3	4	5
It is difficult to collaborate with our strategic customers	1	2	3	4	5
We operate with a low level of collaboration	1	2	3	4	5
Production or skills challenges					
It’s difficult to introduce new products	1	2	3	4	5
Lack of capacity in repair and maintenance	1	2	3	4	5
Lack of adequate bank finance	1	2	3	4	5
Challenged by lack of skills	1	2	3	4	5
Challenged by labor problems	1	2	3	4	5
Challenged by Limited availability of foreign exchange	1	2	3	4	5

Are there any additional major challenges to be mentioned?

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What measures have been taken in your company in order to reduce most encountered challenges?

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THANK YOU!