# ADDIS ABABA UNIVERSITY

# SCHOOL OF COMMERCE


# Factors Affecting volume of Fuel Distribution Practices of Market Follower companies in Ethiopia

**By**

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**Thesis submitted to School of commerce of Addis Ababa University in partial fulfillment of the requirement for award of Master of Arts in Marketing Management**

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**Statement of Declaration**

I, Kassahun Mulat Haileselase, hereby declare that this thesis entitled "Factors Affecting volume of Fuel Distribution Practices of Market Follower companies in Ethiopia" submitted by me for the award of the degree of Master of Marketing Management, Addis Ababa University at Addis Ababa, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

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This is to certify that the thesis entitled, "Factors Affecting volume of Fuel Distribution Practices of Market Follower companies in Ethiopia" as carried out by Kassahun Mulat Haileselase under the supervision of Mesfin Workneh (PhD), submitted in partial fulfillment of the requirements for the degree of Master of Arts in marketing management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Advisor Signature

## SIGNED DECLARATION

This thesis is my original work and all sources of materials used for the thesis have been duly acknowledged.

Addis Ababa University School of Commerce

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Kassahun Mulat

JUNE, 2018

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| CODO | Company owned & dealer operated |
| DODO | Dealer owned & dealer operated |
| EIA | United States Energy Information Administration |
| EPSE | Ethiopian Petroleum Supply Enterprise |
| ETB | Ethiopian Birr |
| HTL | Horizon Terminal Limited |
| KMC | Kilo Meter Cube |
| KPC | Kuwait Petroleum Corporation |
| LPG | Liquefied Petroleum Gas |
| MA | Master of Art |
| MC | Meter Cube |
| MoM | Ministry of Mine |
| MoT | Ministry of Trade |
| YBP | YetebaberutBeherawi Petroleum |

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**ABSTRACT**

*This study was aimed at analyzing factors affecting fuel distribution practices of market follower companies in Ethiopia with specific objectives of examine fuel value chain actors functions, challenges and their relationship along the whole value chain. The data were obtained from both primary and secondary sources. The primary data for this study were collected from 19 market follower oil companies selected purposively. 10 Truck transporters and 15 fuel dealers and 20 consumers selected by using random sampling procedures. MoT fixed profit margin for Oil companies, Truck Transporters and dealers are different according to their value addition activities and these profit margin was assigned before 3 years, due to current the country economic growth and devaluation of Ethiopian currency fuel value chain actors profit margin become very low than previous. It is clear that the oil companies, truck transporters and fuel dealers are not benefiting from the fuel distribution. The whole fuel distribution value chain is governed by EPSE. The result of the multiple regression model indicated that volume of fuel distributed is positively and significantly affected by, utilization of credit, dealers owned gas station, access to market information. Therefore, policies aiming at increasing market follower oil companies improving and increasing credit provider institutions and arranging special kind credit facility, facilitating and improving access land for construction of dealer owned gas station, improving, integrating and easily accessing market information to update fuel value chain actors. Distance from fuel source is negatively and significantly affected thus improving the current road quality and constructing fuel pipeline to reduced transport cost in future are recommended to accelerate the chain's development.*

*Keywords: Factor Affecting, Fuel, Distribution, Market follower oil companies and Multiple Regression*

# CHAPTER 1: INTRODUCTION

## 1.1. Background of the study

Ethiopia is largely unexplored and its oil and gas industry is undeveloped, but foreign upstream firms have flocked to the country in recent years. Meanwhile, a massive roll-out of renewable energy investments is turning the country into a regional power broker (AEF, 2015)

The Oil and Gas sector in Ethiopian is at a very early stage of development, shows good potential for development on the long-run. Exploration for oil and natural gas is recently taking place in a number of areas in Ethiopia, including in parts of the Ogaden Basin in Southern Ethiopia, Southeastern Ethiopia, Afar in Northeastern Ethiopia, Southern Rift Basin, the Gambela basin, the Mekele Basin, Metema Basin, the Abay Basin in Northwestern and Main Ethiopian Rift Basin regions. The Oil and Natural gas sector is governed by the Ministry of Mines (WB, 2017).

Ethiopia is a developing nation which depends entirely on the import of fuel from the oil producing countries. This import of fuel constitutes about 60% of the total imports with every single year. As in the rest of the world, the rise of oil prices is increasingly becoming a big challenge for the economy of the country. The share of fuel in import currency has been increase steadily in recent years, and it is expected to grow even sharper following higher demand due to economic growth. This takes up the lion share of the country's foreign exchange earnings. Ethiopia's oil and gas industry is nascent, but it shows signs of promise (Deloitte, 2016). A significant portion of the country is presumed to have petroleum potential and labeled into different basins (Everette S., Yavuz 2010). Few local and a number of international companies have been engaged in petroleum exploration in various parts of the country.

In the country, glamour of hope is observed on part of oil companies and government for increasing participation from exploration to development and production. However, the level of exploration activities has been very low compared to other areas of the world with similar prospective potential as indicated by geological evidence. Ethiopia has placed less importance on

the oil and gas industry as a means for economic growth. But major discoveries in Kenya, Tanzania and Mozambique have made the sector a greater priority. Therefore, Development of the oil and gas sector in Ethiopia has the potential to transform the country's economy. An adequate and reliable supply of petroleum plays a vital role in the sustainable development of the country (EEA, 2014/15). To this end, a lot of efforts have been expected from the Government of Ethiopia. Driven by accelerating socio economic growth and development, Ethiopia is experiencing increased imported energy consumption and unmet demand for the last many years (Ministry of Water and Energy, 2012). The bulk of Ethiopia's oil supply is imported by EPSE.

Fuel is a combustible substance containing carbon as the major constituent which gives large amount of heat on burning, which can be used for domestic and industrial purposes. The main sources of fuels are petroleum products and fuels are coal etc. There are six major categories fuel: Liquid (Crude oil and petroleum products), Solid (Coal and coal products), Gas (Natural gas), Other Fossil Fuels, Peat and Biomass. Liquid fuel like MGR, ADO, Kerosen, HFO and LFO are the most common type of liquid fuel (WB, 2017).

EPSE is the sole importer and supplier of fuel through a competitive bid on the international market. Transport to the inland demand centers is handled largely by petroleum marketing companies, Transport Corporations and by private truckers at a standard cost regulated by ministry of trade. In 2017, the numbers of oil companies were 13. Currently, distribution and marketing of fuel and other petroleum products are performed by 23 domestic and international oil companies; Yeshi PLC, Gomeju Oil Ethiopia, Tebarek Oil PLC, National oil Ethiopia PLC, Libya Oil Ethiopia LTD, Total Ethiopia Share Company, Taf oil PLC, Yetebaberuit Beherawi Petroleum, Nile Petroleum Company LTD, Olway Petroleum Distributer PLC, WADI Elsundus Co LTD, Genet petroleum PL, Mulage Oil P.L.C, Halefay Petroleum Trading, Habesha Petroleum, Calub Ethiopia Oil Plc, JR oil, Zagol, Ert-ale, Kobil, Dalole, Bilen and Kernel companies ( EPSE, 2018).

More than 650 gas stations (dealers) found in different administrative regions and districts of the country. The number of gas stations does not meet the rapid growth of current cities. Besides, most of these stations have been offering services for the past 30 years and above with their

initial capacity. Due to this limitation, they fail to satisfy current fuel need of the society and in average 50% of the fuel distributed every month for fuel stations is supplied by domestic fuel distributors and when we compare the company's annual volume of fuel distribution about 78.92 % was distributed by only 4 oil companies (Libiaya Oil, Total Ethiopia, NOC and Yetebaberuit Beherawi) the rest 21.08 % was distributed by 19 oil companies (EPSE, 2017).

Fuel supply is a high national and governmental concern, government is searching for alternative solution to fill gap on fuel transportation service has been carried out with limited number of liquid transporting tankers. In the second development and transformation plan it is planned to use train and pipeline as alternative ways to supply fuel. Besides the government is thriving to alleviate the existing distribution and transportation problems from sources ( EPSE, 2017).

Fuel has a very high contribution for country's economic and social development. However, currently fuel scarcity either due to manmade problem or certain supply limitation causes huge damage. The country fuel supply and demand has not been balanced and also there exists frequent distribution problems cause for scarcity and exposes the public community for unnecessary ups and downs and cost. Hence, it becomes imperative to undertake research on factors affecting volume of fuel distribution practices of market follower companies in Ethiopia.

### 1.2. Statement of the Problem

Ethiopia does not have a refinery of its own, it directly import refined petroleum products. The main petroleum products imported to the country are diesel, gasoline and kerosene which are used in the transport sector. In the 2012/13 budget year out of the total petroleum products the country imported three fuels (diesel, gasoline and kerosene) accounted for 1911385.7 metric ton (90%) of the volume and 15,011,117,200.0 Birr (89.2%) of the cost (Abdulmalik, A. and Omokoghio, M. 2014). Ethiopia purchases petroleum products from two sources either in the form of bilateral agreements with foreign governments or international auctions for private oil companies. Currently, Ethiopia buys fuel from the Kuwait Petroleum Corporation and Sudan through these bilateral agreements. The distribution monopoly occupied for a long time by international oil companies has been broken down.

With the much publicized economic growth in the past decade and huge federal funded infrastructure projects, the need for increased fuel supply is crucial and consumption has been rising every year (Abdulmalik, A. and Omokoghio, M. 2014). Recently it has been common to see a long queue of vehicles around petrol stations in Addis Ababa searching for fuel. People, drivers and private vehicle owners run here and there filling up their tanks if they get lucky. The lineups near the stations have exacerbated the high traffic jams that are already annoying people throughout the city. Gasoline shortage, the issues are transportation and distribution problems of fuel than a supply deficiency (EEA, 2013/14). The primary challenge is the shortage of trucks to transport it from the port of Djibouti or Khartoum, that then haul and distribute the commodity all over the country.

The supply of fuel in the country experiences disruptions and inconsistently are becoming a common phenomenon yearly. Despite this, in the last eight years the amount of fuel imported in Ethiopia was rapidly increasing. Compared to the previous years the rate of increase was much higher in the last six years. For example in the fiscal year 2012/13 the amount of petroleum the country imported was showed 16% increase from the previous year while in the same period expenditure on petroleum was increased by 71% (Abdulmalik, A. and Omokoghio, M. 2014)

Fuel distribution scarcity is resulted not as a result of lack of it but due to inadequate number of distribution channels (stations), low storage capacity of distribution stations, and various factors. The customer's requirement of getting standard or quality fuel at the right time place and price are not satisfactory. This is manifested by long queues at Gas stations. The resultant economic and environmental losses of these disruptions are enormous. Furthermore, there is no doubt that Ethiopia's low level of socio-economic development is also attributed, among other factors, to the low development in the energy infrastructure and services (EEA, 2014/15). The costly effects of disruptions are followed by increased lead-times, shortages, reductions in customer service levels and increase in varied costs (Riddalls C.,2002). The continuous absence of fuel in the market would therefore be a recipe for both domestic and commercial users of the product to revert to the use of electricity, charcoal and firewood hence the need to ensure that disruptions in the supply of fuels are reduced to an acceptable minimum level.

Fuel in its different forms - gasoline for cars, diesel fuel for trucks, jet fuel (kerosene) for airplanes but common name of petroleum products are other lubricants is a critical commodity for Ethiopia. It is vital because the disruption of its supply and inappropriate distribution will result in chaos and disorder, negatively impacting the economic and political state of a nation. Hence, addressing the major factors that hindering smooth distribution in the existing business would result in being a mandatory chore for Ethiopian oil companies, so as to address each pitfall outlying through the market.

In recent years, it is witnessed a sporadic shortage of supply of fuel in the country. Even though the level of intensity has reduced to certain extent, the problem persists. For example, there was shortage of Gasoil from November 24-29, 2016 and from December 14-17, 2016. Even, from May 1-12, 2017 (Fortune, 2017). In some of the incidents, it is observed Ethiopian Petroleum Supply Enterprise (EPSE), Oil Companies, and Retailers giving different reasons sometimes contradicting to each other (Melaku, 2016).

This is therefore, study focus on analyzing factors affecting volume of fuel distribution practices of market follower companies and examine other fuel value chain actors, their function and relationship in Ethiopia. An extensive survey of literature has done however, mirrored that there is no a single study conducted in Ethiopia that analyzing factors affecting volume of fuel distribution practices of market follower companies and assessing fuel value chain in Ethiopia. This study, therefore, attempts to address the prevailing information and knowledge gap and enhance understanding about major factors affecting volume of fuel distribution practices of market follower companies and fuel value chain actors, their functions, relationship among chain actors in Ethiopia.

## 1.3. Research Questions

The study was attempted to answer the following questions:-

- What factors determine volume of fuel distribution practices of market follower companies in Ethiopia? How these affect the supply and demand of fuel in the country?
- What are value chain functions and challenges that affect gas stations along fuel value chain practice in Ethiopia?
- What are value chain functions and challenges that affect truck transporter along fuel value chain practice in Ethiopia?
- What are the existing relationships along fuel value chain practices in Ethiopia?

## 1.4. Objectives

### Main Objective

The main objective of the research was to analyze major determinants of volume of fuel distribution practices of market follower companies in Ethiopia.

### Specific Objectives

- To examine the country's fuel value chain actors' functions- identify inefficiencies in the chain and potential leverage chain for improving the of fuel value chain.
- To examine the major challenges that affect the function of gas stations along the fuel value chain- to advise feasible mechanism for the enhance the chain performance.
- To examine the major challenges that affect the function of truck transporters along the fuel value chain- to recommend practical solution for the improved chain achievement
- To Examine relationship along fuel value chain actors- how the value chain actors coordinate and collaborate their effort – identify if there is lack of coordination or collaboration and see how to achieve seamless relationship towards serving the end customer.

## 1.5. Scope of the Study

This study was undertaken in market follower oil companies in Ethiopia. The study focused on analyzing major determinants volume of fuel distribution practices of market follower companies and mapping fuel value chain actors, functions and their relationships in Ethiopia. As identified in statement of this research since the market share ( annual volume of distributed ) of 4 oil companies are higher than the majority of oil companies which named as market follower, where market follower oil companies are encouraged to distribute it and increase their market share, market leader oil companies are not included. This study was also emphases on common type of individual and commercial fuel namely benzene (MGR), Jet A-1 (Jet Fuel), motor diesel (ADO) and kerosene. However, to identify factors affect the volume of fuel distribution study was not included other type of fuel distribution like heavy fuel oil (HFO) and light fuel oil ( LFO) and 4 market leader oil companies are not incorporate in sample respondents.

In other words, fuel present sensitive political issues to governments. Seeking information therefore in the operation of a fuel depot that is owned by the government, as in the case of this study, encountered some difficulties and limitations. Investigating the issue of factor that affect fuel distribution in the case of market follower's oil companies requires massive financial commitment and a longer time. Finally, the problem of exaggerations and distortion of information by respondents might impede the extraction of facts for the purposes of inferences and generalizations. Despite expectations of these limitations, it was carried out diligently to make it representative and useful to add or improve upon the knowledge base in the area.

## 1.6. Significance of the Study

The study identify the major determinant of fuel distribution practices of market follower oil companies and analyze fuel value chain functions and relationship in Ethiopia. The study may generate valuable information on factor affecting volume of fuel distribution practices in the country that might assist ministry of trade to formulate short and long term policy to intervene the existing system. The result of the study might help to recommend possible solution for the responsible government to make significant decisions to intervene in the development of fuel distribution, value chain, marketing and designing of appropriate policies and strategies. The

findings of the study might also be useful to government and non-governmental organizations suppliers, distributors, dealers, transporter and consumers to make their respective decisions. Furthermore, it may also serve as a reference material for further research on similar topics and other related subjects, where little or no research has been done.

### 1.7. Organization of the Thesis

The thesis is organized in five chapters. The first chapter presents the introduction part of the thesis consisting of the background, statement of the problem, objectives, significance, scope and limitations and organization of the thesis. Chapter two presents review of related literature. Chapter three deals with the research methodology. Chapter four presents the main findings and discussions of these results. Summary, conclusions, and recommendations (policy implications) are set out in the last chapter.

# CHAPTER 2: REVIEW OF RELATED LITERATURE

## 2.1. Theoretical Review

### 2.1.1. Global Fuel Value Chain model (theories)

The oil and gas industry encompasses a range of different activities and processes which jointly contribute to the transformation of underlying fuel resources into useable end-products valued by industrial and private customers. These different activities are inherently linked with each other (conceptually, contractually and/or physically), and these linkages might occur within or across individual firms, and within or across national boundaries (WB, 2010).

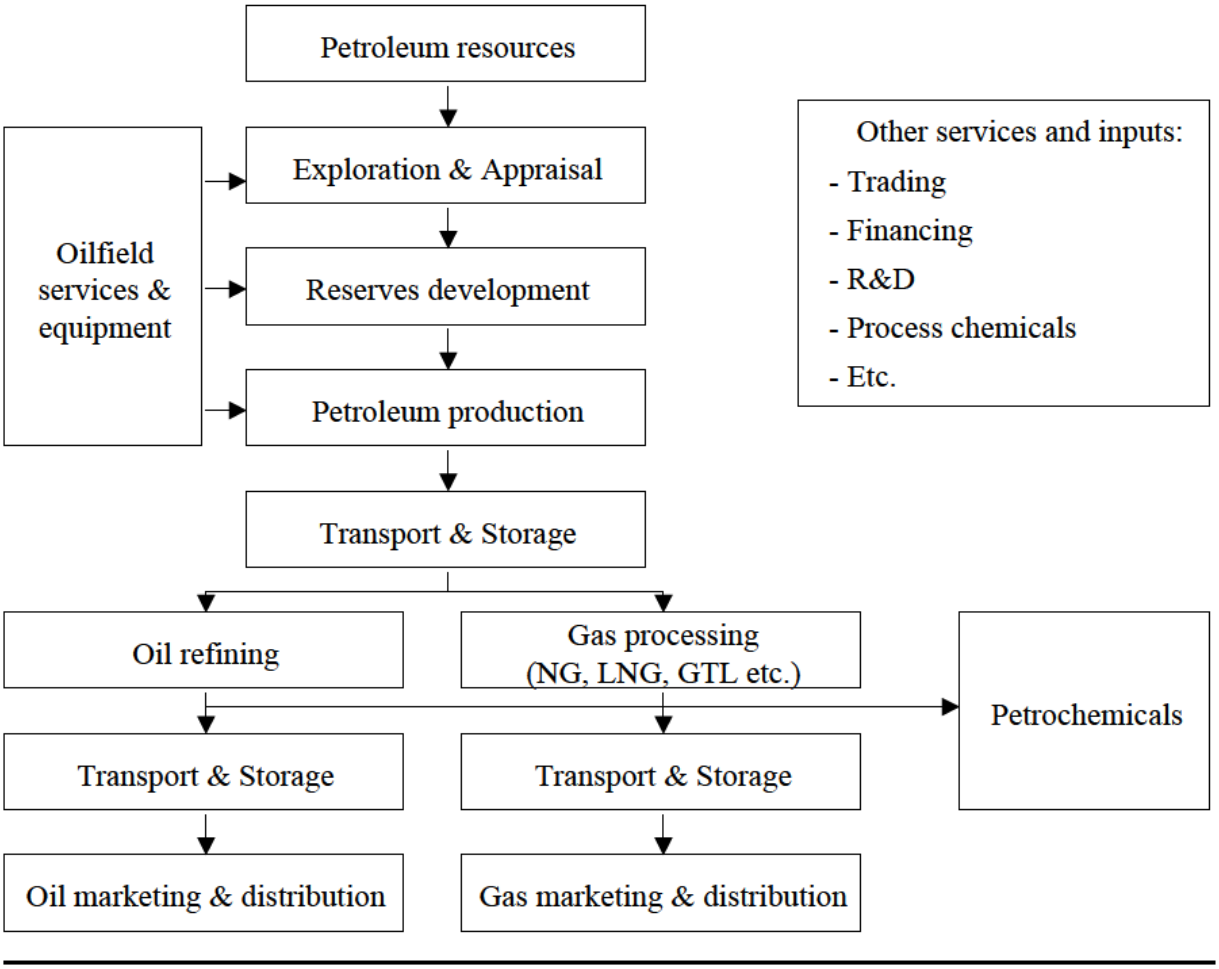
Commodities such as oil, gas, and petrochemicals are transported using different mode of transportation such as pipe-lines, vessels or tankers, road and railroads. These commodities are produced in limited places of the world, yet they are demanded all over the globe since they are an essential source of energy and raw material for many other industries (Raed, Tiravat, Basheer, 2006). The boom in global demand of oil along with the ease of international trade and the inflexibility involved in the petroleum industry's supply chain has made its management more complex and more challenging (Coia, 1999; cited in Barua, 2010).

The idea of a value chain was first suggested by Michael (1985) to depict how customer value accumulates along a chain of activities that lead to an end product or service. However, during the last decades, the underlying concept of value chain was subject to different influences and objectives. The origin of value chain analysis is discussed from two distinct traditions: the French 'filièren concept' and Wallerstein's concept of a commodity chain (Raikes *et al*., 2000). From both, a couple of derivatives have emerged. Well known is Porter's concept of the value chain, Gereffi's global commodity chain, and Humphrey's world economic triangle, whereas the last two were joined to the concept of the global value chain. Therefore, there are many definitions given for value chain in different literature.

The value chain analysis, as popularized by Porter (1985), investigates the sequence of consecutive activities which are required to bring a product or service from conception and

procurement, through the different phases of production and distribution, to the final customer.1 Such analysis can be done for individual firms, for clusters of firms whose value chains are interlinked – usually involving suppliers, distributors/sellers and customers, and referred to as value systems by Porter – or for selected industries (within or across national borders). In line with our focus on social value creation, we will consider the industry value chain for the petroleum sector. Its principal stages are the development, production, processing, transportation and marketing of hydrocarbon, as set out in Figure 1.

**Figure 1. World Petroleum ( fuel) value chain**




Source (WB,2010)

Porter distinguishes between the different stages of supply, the physical transformation from inputs to outputs, and the critical supply services of the firm such as strategic planning or technology development. Porter argues that the greatest value is frequently added by these latter services, and also by the specific combination in which the individual pieces of the chain are combined: Although value activities are the building blocks of competitive advantage, the value chain is not a collection of independent activities. Value activities are related by linkages within the value chain‖ (Porter 1985, p.48).

value chain starts with the identification of suitable areas to conduct exploration for oil and/or gas.2 After initial exploration, petroleum fields are appraised, developed and produced. These activities are generally called Exploration and Production (E&P), or referred to – analogous to other industries – as ―upstream‖ oil and gas. Oilfield services include a number of auxiliary services in the E&P process, such as seismic surveys, well drilling, equipment supply or engineering projects. They form an important part of the overall oil and gas industry (and over the past years and decades have substantially gained in expertise and importance), but will not be the focus of our overview. Infrastructure such as transport (pipelines, access to roads, rail and ports etc.) and storage are critical at various stages in the value chain, including the links between production and processing facilities, and between processing and final customer. These parts of the value chain are usually referred to as ―midstream‖. Oil refining and gas processing are required to turn the extracted hydrocarbons into usable products. The processed products are then distributed onwards to wholesale, retail or direct industrial clients (Refining and Marketing (R&M) is also referred to as ―downstream‖ oil). Certain oil and gas products represent the principal feedstock for the petrochemicals industry, which explains the close historical and geographical links between the two.

Individual companies can cover one or more activities along the value chain, implying a degree of vertical integration (―integrated‖ firms are engaged in multiple successive activities, typically E&P as well as R&M), and/or can seek to expand within a given activity, implying horizontal consolidation (business scale). On the country level, horizontal scale in the upstream is limited by natural resource endowments, and further downstream by the size of the domestic market and/or the ability to export goods and services. Vertical portfolio choices at the country level can

be made using regulatory and licensing tools, e.g. approval (or not) to build certain processing facilities or infrastructure such as pipelines.

**Value creation**

How, then, is value created along the chain? The formal criterion is for the value of aggregate outputs to exceed the value of aggregate inputs on a sustainable basis.3 At the most general level, the potential sources of (contributors to) petroleum sector value creation are:

***(i) Exogenous context and conditions***. Many variables are exogenous to the actors' decision-making, but can materially affect value creation. These factors include, amongst others:

- ✓ The quality and quantity of the resource endowment (incl. geological properties), which determines the availability, technical complexity and implied cost structure of upstream production;
- ✓ The geographic position of the country in question (and of the resources within the country), which determines the access to domestic and export markets as well as the availability of natural infrastructure (sea ports, rivers etc) the structure of the domestic economy, including dependence on and interactions with the petroleum sector.

**(ii)** ***The companies participating in the sector.*** These include national oil companies (NOCs) and/or privately-owned oil companies (POCs). 4 Companies which are operators of petroleum installations have an obvious role to play in creating value, but even non-operating investors often provide valuable capital and/or expertise. Key sources of value creation include:

- ✓ (cost) efficiency of operations (incl. exploration, production, refining, marketing) and overhead spending, as well as investment efficiency;
- ✓ technical excellence, which may support higher reserve replacement and field recovery rates, fewer fuel losses, higher-value product yield (refining) etc.;
- ✓ potential benefits from horizontal concentration (economies of scale) and vertical integration (transaction costs, economies of scope); and
- ✓ Corporate strategic choices, such as asset selection, targeting of domestic vs. export markets, etc.

(iii) **The sector's organization and institutional properties.** The companies' ability and willingness to perform well are embedded within, and affected by, matters of sector organization

and governance, which to a large extent are the result of specific policy decisions, including the following:

- ✓ the mechanism/regime for capital allocation decisions between different stages of the value chain, and within individual stages – possible choices include free and competitive markets, restricted and regulated entry, or a combination of both;5
- ✓ licensing policy (in a broad sense), in order to steer sector activity towards a minimum/maximum level of exploration, production,6 refining, number of retail stations etc;
- ✓ the tax system, including subsidies, in order to encourage desired behavior, and to capture a share of the value for the state;
- ✓ the identity, responsibilities and competencies of regulatory authorities;
- ✓ legal and regulatory provisions more generally, including market and trade regulation; and
- ✓ National petroleum and industrial policy, including commercial vs. non-commercial objectives, the development of local supply industries etc.

**Technical structure and actors**

The technical production process can generally be separated into five stages: input supply, primary production, processing, marketing and consumption. On every stage, one to several different actors can be found. Trading activities do not only take place between the stages of processing and consumption but also between production and processing or input supply and production. Nevertheless, it is not mentioned as an own stage of the chain there. It is assumed that between these stages trading activities are mostly undertaken by the participants of the respective stages as a pure transfer of goods within the production process without specific marketing activities (Schipmann, 2006).

**Importance of value chain analysis**

Value chain analysis is conducted for a variety of purposes. The primary purpose of value chain analysis is to understand the reasons for inefficiencies in the chain and identify potential leverage points for improving the performance of the chain, using both qualitative and quantitative data. (Anandajayasekeram and Berhanu, 2009).

Value chain analysis is a useful analytical tool that helps understand overall trends of industrial reorganization and identify change agents and leverage points for policy and technical interventions. It is increasingly used by donors and development assistance agencies to better target their support and investments in various areas such as trade capacity, enterprise competitiveness, income distribution and equity among value chain participants. In addition, the analysis consists of identifying chain actors at each stage and discerning their functions and relationships; determining the chain governance, or leadership, to facilitate chain formation and strengthening; and identifying value adding activities in the chain and assigning costs and added value to each of those activities (UNIDO, 2009).

It is an innovation that enhances or improves an existing product, or introduces new products or new product uses. This allows the farmer to create new markets, or differentiate a product from others and thus gain an advantage over competitors. In so doing, the farmer can ask a higher premium (price) or gain increased market share or access. Adding value does not necessarily involve altering a product; it can be the adoption of new production or handling methods that increase a farmer's capacity and reliability in meeting market demand. Value-added can be almost anything that enhances the dimensions of a business. The key is that the value-adding activity must increase or stabilize profit margins, and the output must appeal to the consumer (AAFC, 2004).

Traditionally, little attention has been paid to the value chains by which agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities. While high-income countries add nearly US$185 of value by processing one tone of agricultural products, developing countries add approximately US$40. Furthermore, while 98 percent of agricultural production in high-income countries undergoes

industrial processing, barely 38 percent is processed in developing countries. These indicate that well developed agro-value chains can utilize the full potential of the agricultural sector (UNIDO, 2009).

In the process of preparing an agro-industrial master plan for Ethiopia, a prioritization process was conducted for several commodities to identify those offering the highest prospects for growth (UNIDO and FAO, 2009). Group 1: Commodities that are highly important to the economy due to the large population involved in their production and to their contribution to national food security. This group includes: (i) cereals (wheat, maize, teff and barley); (ii) oilseeds (sesame, Niger seed, linseed and rapeseed); (iii) coffee; and (iv) sugar. Group 2: Commodities that are of importance to the economy, This group includes: (i) oil; (ii) meat; (iii) tea; and (iv) fruit and vegetables. Group 3: Commodities that entail a competitive advantage for Ethiopia. This group includes: (i) honey; (ii) pulses; (iii) spices; and (iv) grapes/wine.

**Methodology for value chain analysis**

Value chain analysis is very effective in tracing product flows, showing the value adding stages, identifying key actors and the relationships with other actors in the chain. It is actor oriented. Generally, Taylor (2005) has outlined the following summary of value chain analysis methodology. The methodology focuses on three key issues:

**The dynamics of information in the value chain,** from final consumption through to primary production and input suppliers and back again how inclusive, transparent and responsive are the information flows in the chain? To what extent are stakeholders' decisions (what to produce, when to produce, how to produce) influenced by what consumers value?

**The creation and flow of value**, in the eyes of the final consumer, at each stage in the value chain, how many of the production and processing activities truly add value? How much investment is being made in these critical activities? How many are necessary but do not add value (these should be completed with minimal resource allocation)? How many are unnecessary

(wasteful activities must be eliminated and resources re-allocated to drive value creation and efficiency)?

**The nature of relationships**: how much trust exists between different stakeholders? What is the nature of communication within and between organizations? What evidence is there of organizational commitment? How are risks shared and the assumption of risks rewarded in the chain?

### 2.1.2. Market Leadership

**A market leader** is the brand whose product or service offering has the largest share in a specific market category". Since, market leaders often enjoy a larger marketing and advertising budget than their competitors; they typically lead competing firms in market reach and coverage, promotional depth and new product introductions. As such, they can afford to invest in new technologies, systems and processes that fortify them against onslaughts by competitors (Kotler, 2003). Market leaders act as a reference point for their competitors who may decide to ignore, emulate or confront them. In the 1970s the Profit Impact of Market Strategy (PIMS) study, a joint initiative of the Strategic Planning Institute and the Harvard Business School, was launched. Over several years, hundreds of firms and their businesses were closely monitored to pinpoint the most significant variables affecting a firm's profitability. The study identified market share as the most important factor. As a result, gaining market share and striving to be the top player became the business focus of many firms (Kleber and associates, 2012).

Gilligan and Wilson (2009), states that in the majority of industries there is one firm that is generally recognized to be the leader. It typically has the largest market share and, by virtue of its pricing, advertising intensity, distribution coverage, technological advance and rate of new product introductions, it determines the nature, pace and bases of competition. It is this dominance that typically provides the benchmark for other companies in the industry. However, it needs to be emphasized that market leadership, although often associated with size, is in reality organization's ability to determine the nature and bases of competition within the market.

**Market Follower (Challenger)**

Gilligan and Wilson (2009) found that Firms with a slightly smaller market share can adopt one of two stances. They may choose to adopt an aggressive stance and attack other firms, including the market leader, in an attempt to gain share and perhaps dominance (market challengers), or they may adopt a less aggressive stance in order to maintain the status quo (market followers).

**Strategies for Market Leaders**

Attaining market leadership needs excelling in several dimensions in terms of followed marketing strategies in particular. Market leaders are price leaders, gives a due attention to promotional activities through analyzing nature of the market and differentiators in service delivery and products. More over attainment of market leadership needs responsiveness to the wide macro environment in general and marketing in particular in light of carefully designing appropriate marketing strategy compatible with the existing business environment.

According to Gilligan and Wilson (2012), although a position of market leadership has undoubted attractions, both in terms of the scope that often exists to influence others and a possibly higher return on investment, leaders have all too often in the past proved to be vulnerable in the face of an attack from a challenger or when faced with the need for a major technological change. If, therefore, a market leader is to remain as the dominant company, it needs to defend its position constantly. In doing this, there are three major areas to which the marketing strategist needs to pay attention; how best to expand the total market? How to protect the organization's current share of the market? How to increase market share? In the 1960s and 1970s, for example, Honda increased its sales by targeting groups that traditionally had not bought motorcycles. These groups, which included commuters and women, were seen to offer enormous untapped potential. The company unlocked this by developing a range of small, economic and lightweight machines, which they then backed with a series of advertising campaigns giving emphasis to their convenience and style (Gilligan and Wilson, 2009).

Taking into account the above arguments made by the authors market leaders are always expected to see far in having in-depth icon for their business so as to implement an appropriate strategy for a consistent and sustainable competitive advantage they may obliged to have over

their competitors. Hence elements like strong customer relations, strong distributor relations, targeting non-user groups are majorly deemed to be the vital ones. Being among strategies by market leaders, On the other hand, market expansion involves encouraging existing users of the product to increase their usage rates, a strategy pursued with considerable success by Procter & Gamble with its Head and Shoulders brand of shampoo, which was promoted on the basis that two applications were more effective than one. At the same time as trying to expand the total market, the market leader should not lose sight of the need to defend its market share. It has long been recognized that leaders represent a convenient target since, because of their size; they are often vulnerable to attack. Whether the attack is successful is often determined largely by the leader's ability to recognize its vulnerability and position itself in such a way that the challenger's chances of success are minimized (Gilligan and Wilson, 2009).

**Strategies for Market followers**

Market Followers are expected to see far in-depth to their followed strategies compared to market leaders. Owning strong competitor analysis and market intelligence are the major pillars by which market followers should stand in a front line of a given industry. Above all, Market followers will be mandated to design a strategy for offending market share from the leaders in addition to securing their existing share through developing a defensive strategy. According to (Gilligan and Wilson, 2012) Companies that are not market leaders are faced with a straightforward strategic choice: either they attack other firms – including perhaps the market leader – in an attempt to build market share and achieve leadership themselves (market challengers), or they pursue a far less aggressive strategy and, in doing so, accept the status quo (market followers). In deciding between the two, several factors need to be taken into account, the most significant of which are the costs of attacking other firms, the likelihood of success, the eventual probable returns, and the willingness of management to engage in what in most cases will prove to be a costly fight.

On the other hand according to Forti (2012) Followers are companies, brands or products that were not fortunate enough to be first in the market. They have a very small market share compared to leaders and challengers. They are happy only to follow the leaders and their main advantage is that they take the market opportunities that have been created by the leader. They

are sometimes referred to as “imitators” and successful followers do not go to market to “steal” the customers of leaders. Instead they present similar products side-by- side with those of the leading brand. Being a follower does not necessarily mean that these companies are operating without strategies. Followers must understand customers‟ needs perfectly in order to hold onto them on one hand, and they should know how to expand their market share on the other hand. They thus try to bring distinctive advantages to the customers in terms of location, services and distribution channels. Since they are under the constant threats of challengers and the watchful eyes of leaders, they must keep production cost low, without compromising their quality and must follow a path that does not attract competitive retaliation from leaders or challengers.

Srinivas, *et al* (2014) tried to pinpoint how ING a branchless internet bank could own a market leadership position in retail financial service in the United States. And accordingly argued that, focusing in product innovation or service differentiation is much vital than offering cheaper. In doing this, such organizations have to stick against offering a non-price value such as greater functionality or better customer service.

In addition the authors argued on what a company should while finding itself on follower position. Accordingly the joint study revealed that, market following companies should either going cheaper being a cost leader in a given industry as or differentiate their services in terms of delivery, customer service and responsiveness towards customer complaints if any. Coordination of efforts from top to lower level workers in a follower company should be enhanced in light of winning the outlying competition an industry.

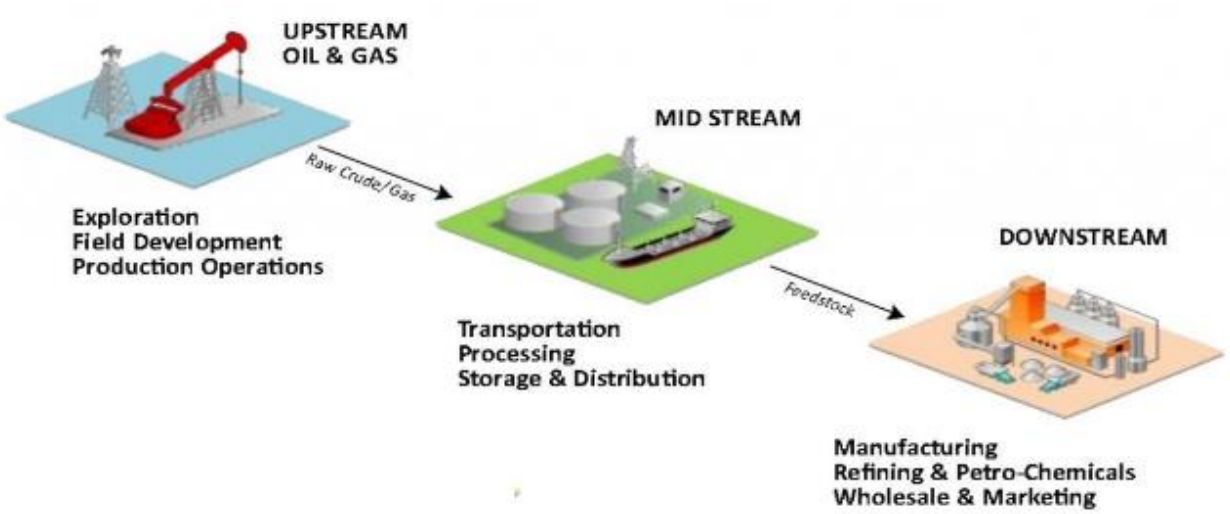
### 2.1.3. Value chain in the oil marketing companies

The value chain includes not only the processor and the suppliers but also the transporters, warehouses, /dealers/ retailers, and even the customers themselves (Chopra and Meindl, 2008). Energy makes the wheels of global supply chains go round (Bud La Londe, 2006). The oil marketing companies are involved in a global value-chain that includes domestic and international transportation, ordering and inventory, visibility and control, materials handling, import/export facilitation and information technology. Thus, the oil marketing companies offer classic model for implementing supply-chain management techniques. The top world oil

producers are Saudi Arabia, Russia, the United States, Iran, Mexico, China, Canada, United Arab Emirates, Venezuela, Norway, Kuwait, Nigeria, Brazil, Kazakhstan and Iraq. The Organization of the Petroleum Exporting Countries (OPEC) controls major crude oil by setting production quotas. The values are added by processing and chemically changing the crude oil, which is called refining. It is important to note that greater economic rewards can be gained only with well-integrated global oil value chain management.

The generic value chain of fuel includes upstream sectors (companies involved in exploration and extraction of crude oil), midstream sectors (companies involved in storage and processing, storage & distribution), downstream sectors (companies involved in refining, marketing, distributing and transporting of petroleum product) and the consumers.

**Figure 2. Fuel and gas industry**




*Source: http://avata.com/oil-gas*

Fuel value chain is about the multiple organizations that are in the network – the producers and the distributors – and there is a tremendous need to get everyone to pull together in the same direction (Handfield, 2016).

More than 80% of the world's proven oil reserves are concentrated in just 10 countries. Venezuela holds the world's biggest proven oil reserve followed by Saudi Arabia, while Canada

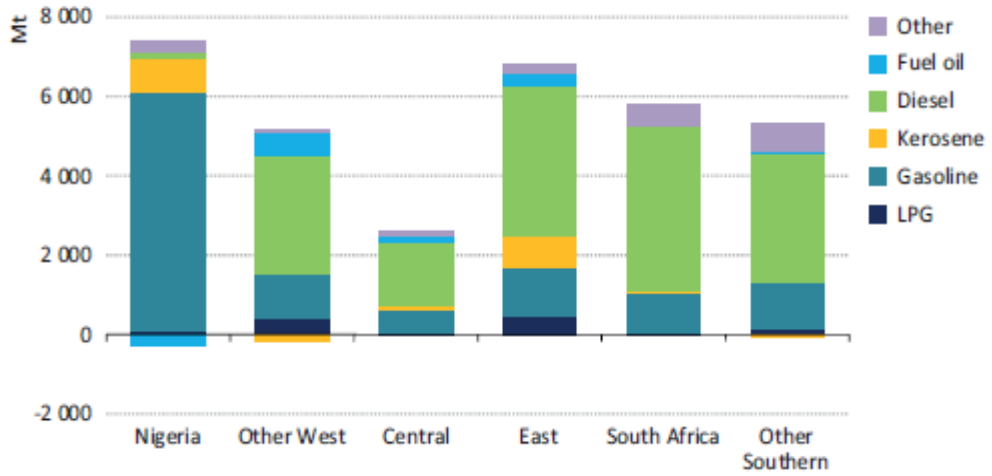
and Iran hold the third and the fourth largest oil reserves. Nigeria holds the tenth largest proven oil reserves in the world (Hydrocarbons-Technology, 2013). The five biggest oil consuming countries are United States of America, Chain, Japan, India and Russia(Hydrocarbons-Technology, 2013).

For 2016, the United States Energy Information Administration (EIA) Oil Market Report forecasts worldwide average demand of nearly 96 million barrels of oil and liquid fuels per day. It also states, in the next five years, Asia will remain the major source of oil demand growth. China will be central to demand growth, partly because of the underlying rise of oil demand but also due to its build-up of strategic reserves which will reach at least 500 mb by 2020. EIA projects that the world's energy consumption will increases from 2011 by 53% by the 2035 (Gruenspecht, 2011).

### 2.1.4. African oil demand by Sub-region

The figure below shows the growth of Oil demand in Africa by Sub-Region. Except in Nigeria, in all other regions the diesel demand has shown significant growth.

**Figure 3. Africa oil demand by sub-region**




Notes: Mt = million tonnes; kerosene includes jet fuel. Sources: CITAC; IEA analysis.

### 2.1.5. Ethiopian fuel value chain management

Over the past 50 years, the fuel value chain management of Ethiopia is regulated by government. Ethiopia consumes daily one million liters of benzene, 6.5 million liters of diesel and two million liters of jet fuel. The annual kerosene consumption is 260,000metric tons. The country's annual fuel consumption has been growing at a rate of ten percent per year. In 2017 the fuel consumption is expected to surge to 3.4 million metric tons.

In Ethiopia, so far, there is no discovery of oil in commercial quantities. Exploration for oil and natural gas is currently taking place in a number of areas of the country, including the parts of the Ogaden Basin, in Southern Rift Basin, the Gambela basin, the Mekele basin, Metema Basin, the Abay Basin in North Western and main Ethiopia Rift Basin regions. The sector is currently at a very early stage of development. However, it shows a good potential for development in the long-run (The World Bank, January 2016). At present, Ethiopia spends 2.5 billion USD annually on imported petroleum products tons (The Reporter 22 Oct, 2016), which is of the country's 20% of the country's imports of goods is purely spent on fuel (Euromoney, 2015).

In recent years, it is witnessed a sporadic shortage of supply of fuel in the country. In some of the incidents, it is observed EPSE, Oil Companies, and Retail Stations giving different reasons sometimes contradicting to each other. The problem still persists even though the level of intensity has reduced. For example, there was shortage of Gasoline from November24-29, 2016 and from December 14-17, 2016 at Djibouti. Although the general public, especially in Addis Ababa did not feel the impact of the shortage, Oil Companies were not able to supply some of their commercial and upcountry retail customers as per their contract or service level agreement.

**Downstream Petroleum Sector in Ethiopia**

Since Ethiopia does not produce oil, to meet the country's oil requirement, the country imports and distributes to customers. Accordingly, the study focuses on downstream petroleum sectors, in particular on purchasing and distribution of petroleum product.

Ethiopia buys 100 percent of the country's jet fuel consumption, 800,000 metric tons and 60 percent of diesel, 1.2 million metric tons from state-owned Kuwait Petroleum Corporation (KPC)

that supplies the products directly from Kuwait using its own fuel tanker vessels. Sudan supplies 85 percent of Ethiopia's benzene consumption. The remaining 40 percent of the diesel and 15 percent of the benzene consumption are bought from international oil trading firms through an international open tender process.

A value chain consists of all stages involved, either directly or indirectly, in fulfilling a customer request. Supply chain has always been about companies working together to achieve a certain objective. The relationships among these companies have always involved some degree of collaboration and coordination to solve bottlenecks in the value chain network and overcome bumps in demand and supply (Gonewa & Henry, 2003). Through supply chain integration, the total supply chain network in the industry will work more efficiently by sharing valuable information, resources, knowledge and expertise with each other (Tamzidul, 2012).

In Ethiopia, the demand for oil is growing exponentially. Ethiopian government has intentions and plans to expand the depots. The plan is not only to expand but to elevate the capacity of the existing depots. In Awash, it is started to build a 60,000 cubic meter capacity tank and it is under construction now. Another plan is to build one 30km south of Addis Ababa at Dukem, along the newly built railway, just before Debre Zeit (Hailemariam, 2016).

In Ethiopia, the demand for oil is growing exponentially. Fekadu (2013) mentioned that at present, liquid bulk cargo tanker trucks are transporting fuel from Duraleh petroleum terminal of Djibouti port and from Sudanese refinery at El Geli located 42kms north of Khartoum to the hinterland. The government has intentions and plans to increase the number of depots, but also to elevate the capacity of the existing depots. Accordingly, in Awash, it is started to build a 60,000 cubic meter capacity tank.

There is also a possibility of using rail wagons using electricity-powered railway system that has just been completed from Djibouti to Sebeta. The aim for the National Railway Network of Ethiopia is to build eight new railway lines for freight and passengers covering a total distance of 5,000 kilometers working across the country by 2020 (www.ethiopianembassy.be/en/2017). But the railway that connects to Duraleh petroleum terminal of Djibouti port and then from the Awash main line to the Awash NPRDA depots have not been started yet. The areas to be

supplied from this depot depend mainly on the number of trains to be dedicated for the purpose, the storage and loading capacity of the terminal. This will reduce the demand for oil because the transportation system for dry cargo and even for fuel requires thousands of trucks moving from Ethiopia to Djibouti. There is also a plan to build a depot some 30km south of Addis Ababa at Dukem, along the newly built railway, just before DebreZeit (Tadesse – CEO of EPSE, 2016).

Fekadu (2013) stated that two Chinese state-owned companies have been involved in building of the rail way and transportation cost can be reduced further and environmental impact of fuel transport can be minimized by using train tankers and/or pipelines. Besides, there rail transportation, there is a plan to stretch a pipeline up to Awash, the main stock reserve depot. Tadesse, CEO of EPSE (2016) mentioned it is found viable a 550km-long pipeline that will stretch form Djibouti port to Awash national reserve depot, which is 250km to the east of Addis Ababa with a capacity of 100,000 cubic meters, so that the whole country can be supplied directly from Awash.

At present, road transportation is used for the transportation of oil from Djibouti and Sudan into the country. However, there is plan to use rail transportation and pipeline in the near future. Stakeholders involved in the overall supply and distribution of fuel in Ethiopia.

#### 2.1.5.1. Oil supply and distribution in Ethiopia

**Ethiopian Oil supply marketing system**

The regulation issued to administer the petroleum downstream sub-section, the first one is regulation issued by council of ministers number 265/2012 to establish Ethiopian petroleum supply enterprise and oil and oil products supply work inspection proclamation number 838/2010 all two regulation to be mentioned. Accordingly the Ethiopian petroleum supply enterprise which is supplying downstream petroleum to the national was established in proclamation as government development enterprise and accountable to the ministry of finance and economic development. EPSE is sole importer of oil products needed in the country and purchase of oil executed through state to state agreement and international bid.

EPSE executes the purchase of oil in two basic systems : 1st it makes direct purchase from government owned oil refinery oil producing countries and the remaining amount of oil is purchased through open international bid. In 2017, the oil demand of the country has reached more than 3.5 million metric tons and its costs more than 2 billion USD ( EPSE, 2017).

In 2017, the direct purchase of the white diesel demand covers 50 % which is the petroleum amount covers 1,200,00 Metric tons and the petroleum supply in full per year amounts 800,000 metric tons is supplied from Kuwait oil corporation, in general, out of the benzene demand 40% which is 144,000mt supply is purchased from the Sudan petroleum corporation. with regard to the purchased of private oil supplies the total oil supply to the country, 60% of benzene which is 190,000mt and 44% of the white diesel demand which covers 1,000,000mt is supplied through opened bid and entered in to agreement with supplier companies (Chinese government oil company named Petro-china international Singapore PTE.LTD.

### *2.1.5.2.* Development of Fuel distributor oil companies

The duty of distributing and dispatching fuel in the country ( before or after the establishment of petroleum enterprise ) was run by distribution companies. 4 major external companies were participating since the beginning. They were Shell Ethiopia limited, Total Ethiopia, Mobile oil East Africa and Agip Ethiopia. After years of distributing services, Agip Ethiopia withdrew from African market by the year 2001. Since Shell took over Agip place. Shell also stayed up to 2008 and replaced by oil Libya. Similarly when Mobil left from African market in 2006, Total took over the business. Thus, limited foreign fuel companies managed the distribution of fuel for several years.

In order to alleviate such limitation and monopoly of the business by few external companies, the government made a policy improvement in the sector. The improve was minimizing the national requirements to open oil companies and other policy reform. The improvement policy paved way for active participation of domestic companies; the first domestic company ( National Oil Company) joined the market in 2005. The number become increase rapidly, number was 12, 13 and 23 oil companies in 2016, 2017 and 2018 respectively. Among the total oil companies more than 60% of companies are domestic owned business. However, these oil companies still have

limited fuel distribution performance due to several factors that affect the fuel distribution such as limited number of gas stations (Dealers), low profit margin, problem relating with truck transport etc (EPSE,2018).

## 2.2. Review of Empirical Evidences

An oil and gas resource is one of the key revenue generators to the Gross Domestic Product (GDP) of most oil producing countries. The usefulness of this resource is undeniable. Most countries have benefited immensely from oil and gas resources whiles this same resources have resulted to what is termed as the 'oil curse'. While, for oil importing countries, expending their budget for in importing of oil from oil producing countries.

There are no specific studies on factor affecting fuel distribution practices of market follower oil companies in Ethiopia and African countries. However, there are a number of studies on challenges of fuel supply chain and related one; those studies indicated that fuel sub-sector faces some challenges. Among others: highly disorganized and fragmented industry with weak value chain linkages, long and inefficient supply chains, inadequate information flows and lack of appropriate production are explained as the major problems. The study recommended institutional innovation to reduce the above challenges.

Shah, Li, and Ierapetritou (2011 as cited in Shatina, Zulkifli&Norlena; 2014) state that, a typical petroleum industry supply chain is composed of an exploration phase at the wellhead, crude procurement and storage logistics, transportation to the oil refineries, refinery operations, and distribution and transportation of the final products.

According to (J. Amue1 & Ozuru, 2013), the integration on information, knowledge, processes and through which different functions within and outside of the sector can work together to enhance the level of efficiency as well as reduce the cost of operation to increase organizational effectiveness. Integration in this context refers to the extent to which various supply chain activities and processes work together in as seamless manner as possible (Sweeney, 2011). He continues, and mentions that there is significant evidence confirming effective implementation of

integrated SCM has the potential to generate significant improvements in the performance of firms.

According to Bertrand, W. G. (2014) used Petroleum Value Chain analysis. Study mentioned about the need for collaborative relationship, information sharing, reducing transport cost, and to work as a single entity with a common objective to serve the end customer. Although, the importance of value chain relations is widely acknowledged, seamless coordination is rarely achieved in practice coupled with several challenges.

As stated previously, there is no specific study on factor affecting fuel distribution practices of market follower companies in Ethiopia. But there are a number of empirical studies on factors affecting the marketable supply of agricultural commodities. For instance, Kinde (2007) identified factors affecting the marketable surplus of sesame by using OLS regressions. He found that sesame marketable supply was affected by; time of sale, use of improved production inputs, membership in local organization, extension contact and distance to market. Abay (2007) applied OLS regressions to analyze the determinants of vegetable market supply. Accordingly, the study found out that marketable supply of vegetables were significantly affected by family size, distance from main road, number of oxen owned, extension service and lagged price. In a similar way, OLS model is used by Getachew (2009) to identify factors affecting honey supply in Burie district. Honey supply is found to be significantly affected by experience, non-farm activities, training and improved inputs.

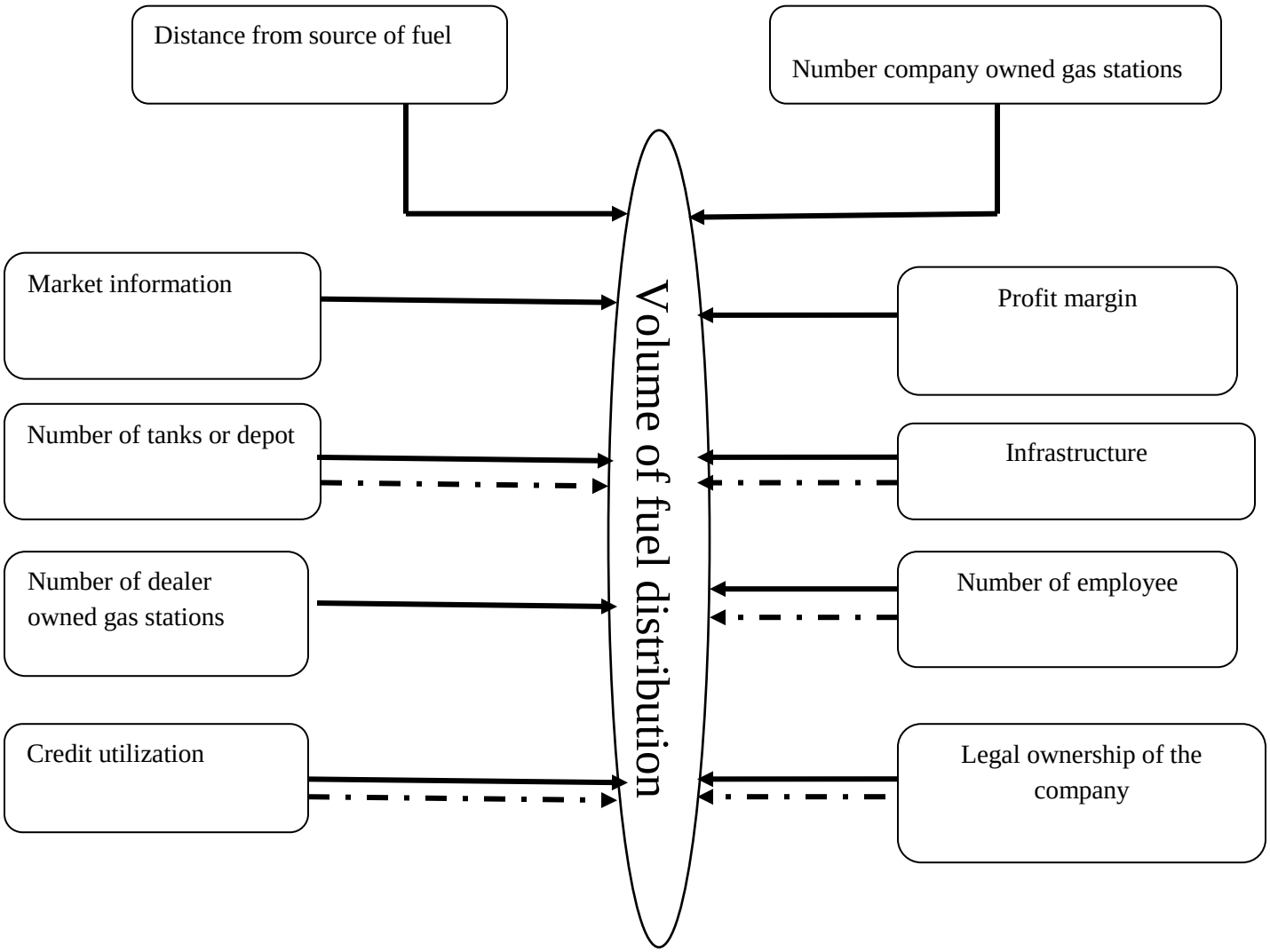
In sum, empirical evidences indicate that value chain analysis and marketed supply approach has become an important framework to analyze economic agents in industry sector. Therefore, the study identifying factors affecting the volume of fuel marketed of market follower companies and assessing fuel value chain actor's functions and their relationship along fuel value chain in Ethiopia.

## 2.3. Conceptual frame work of the research

Challenges in value chain management, as listed by Fawcett et al 2007, are poor coordination of effort, incompatible information systems, long distance from supply, communication problems, customer service issues, excessive waste and environmental degradation, relatively high inventory for the level of customer service achieved and lower than optimal profits. On the other hand Chandra and Grabis (2007) have identified value chain issues and related problems as distribution network configuration, inventory control, quality contract, distribution strategies, value chain integration problem and strategic partnering, outsourcing and procurement strategies, information technology and decision support systems (DSS) and customer value.

For this particular research, the researchers were identifying the major factors that affect volume of fuel distribution practices of market follower companies in Ethiopia. These are relating with the supply, market information communication, credit access and utilization, fuel storage facility, number of gas station, transportation issues, price and profit related problems, quality and number of fuel dispensing pump machine, and relationship issues along fuel value chain in Ethiopia. As described above, these problems cross other multiple specific problems and cross multiple value chain processes. For example, market information communication along fuel value chain related to distribution, demand management, transportation, supply control, and procurement so on.

**Figure 4. Research Conceptual Framework**




Key;

Positive relationship

Negative relationship

Source; Author, 2018

# 3. RESEARCH METHODOLOGY

This chapter sets out various stages and phases are followed in completing the study. It involved a blueprint for the collection, measurement and analysis of data. In this stage, most decisions about how research was executed and how respondents were approached, as well as when, where and how the research was completed. Therefore in this section the research identified the procedures and techniques were used in the collection, processing and analysis of data.

## 3.1. Description of study area

The study was conducted on market follower oil companies in Ethiopia.

**Figure 5. Map of Ethiopia**


According to Ethiopian Central Statistical Authority (2005), Ethiopia is located in the Horn of Africa. It is bordered by Eritrea to the north, Djibouti and Somalia to the east, Sudan and South Sudan to the west, and Kenya to the south. Ethiopia has a high central plateau that varies from 1,290 to 3,000 m (4,232 to 9,843 ft) above sea level, with the highest mountain reaching 4,533 m (14,872 ft).

Ethiopia covers 1,122,000 square kilometres with the population of 96 million. 90% of the populations live in rural areas and depend for survival mainly on agricultural products such as teff, wheat, maize, barley and sorghum. Ethiopia is the tenth largest and the second most populous state in Africa after Nigeria.

Ethiopia has small reserves of gold, platinum, copper, potash, and natural gas. It has extensive hydropower potential. Of the total land area, about 20 percent is under cultivation, although the amount of potentially arable land is larger. Only about 10 to 15 percent of the land area is presently covered by forest as a result of rapid deforestation during the last 30 years. Of the remainder, a large portion is used as pasturage. Some land is too rugged, dry, or infertile for agriculture or any other use.

**Oil companies in Ethiopia**

In 2017, the numbers of oil companies were 13. Currently, fuel distribution and other petroleum products are performed by 23 domestic and international oil companies; Yeshi PLC, Gomeju Oil Ethiopia, Tebarek Oil PLC, National oil Ethiopia PLC, Libya Oil Ethiopia LTD, Total Ethiopia Share Company, Taf oil PLC, Yetebaberuit Beherawi Petroleum, Nile Petroleum Company LTD, Olway Petroleum Distributer PLC, WADI Elsundus Co LTD, Genet petroleum PL, MULAG OIL P.L.C, Halefay Petroleum Trading, Habesha Petroleum, Calub Ethiopia Oil Plc, JR oil, Zagol, Ert-ale and Kernel companies ( MoT, 2018). Among the total of 23 oil companies in the country 19 are market follower oil companies and only 4 oil companies are market leader based on annual volume of fuel distribution.

### 3.2. Research Design

Research design is an outline of research study which indicates that what the researcher was done from writing the hypothesis and its operational implications to the final analysis of data. A research design is the arrangement of conditions for data collection and analysis of data in a manner that aim to combine relevance to research purpose with economy in research procedure (Kothari, 2004). Research design constitutes decision regarding what, why, where, when and how concerning an inquiry or a research study (Sekaran, 2011).

This study was employed descriptive survey design. Descriptive survey was used to describe the present situation, what people currently believe, what people are doing at the moment and so forth (Baumgartner, Strong and Hensley 2002). This design is selected for this study because it provided numeric descriptions of the population and describes events as they are, as they were or as they will be (Kombo &Trump, 2006).

In the first part, the researcher identified and examined fuel value chain actors and their functions, their relationship and maps the value chain of fuel distribution oil companies in Ethiopia. Study applied quantitative and qualitative research design (a mixed research). The study basically depends on descriptive analysis with cross sectional data. Essentially, these types of research described what exists and help to uncover new facts and meaning. The purpose of descriptive research is to observe, describe and document aspects of a situation as it naturally occurs. In this study, questionnaire and discussion with fuel distributor oil companies as main instruments were employed to obtain data in descriptive studies.

In the second part, to analysis the factors that affect fuel distribution practices of market follower companies in Ethiopia. Study applied econometric model to analysis the factor that affect fuel distribution practices of market follower companies in Ethiopia. Cross sectional data used to assess the factors that affect the fuel distribution practices of market follower companies in Ethiopia and also to examine fuel value chain actors functions, their relationship and their challenges along the value chain. Essentially, this type of research identified the major factors that affect fuel distribution practices and to recommend possible solution only for significant factors. In this study, like wise descriptive analysis questionnaire as main instruments will be employed to obtain data in factors that affect volume of fuel distribution practices of market follower companies in the country. As study mainly focused on a gap analyses in the fuel distribution practices of market follower companies and also to examine fuel value chain actors functions, their relationship and their challenges along fuel value chain in Ethiopia.

In the third part, depth interviews based on structure checklist was used to address individuals oil companies, dealers, transporters, organization, institution and others who have stake on fuel distribution efficiency in Ethiopia.

### 3.3. Hypothesis, variable selection and definition

In the course of identified factors affecting fuel distribution practices of market follower companies, the main task was exploring which factors significantly influence and how (the direction of the relationship) these factors are related with the dependent variable.

**Dependent variable**

**The volume of fuel distribution (Annual sale volume):** It is continuous dependent variable and measure in litter. It represents the actual quantity of fuel distributed by market follower oil company.

**Independent (explanatory) variables**

| No | Independent Variables | Description of Variables | Hypothesis |
|---|---|---|---|
| 1 | Access to revised market information | continuous variable | + |
| 2 | Fuel storage capacity of tanker | continuous variable | + |
| 3 | Fixed profit margin | continuous variable | +/- |
| 4 | Number company owned of gas station | continuous variable | +/- |
| 5 | Distance from the source | continuous variable | - |
| 6 | Leadership structure of the company | continuous variable | +/- |
| 7 | Number of employee | continuous variable | +/- |
| 8 | Credit Utilization | continuous variable | +/- |
| 9 | Number dealer owned of gas station | continuous variable | + |
| 10 | Access to land to construct gas station | continuous variable | +/- |

### 3.4. Target Population

Burns and Grove (2003) and Mugenda (2003) describe population as all the elements that meet the criteria for inclusion in a study. Population is therefore the entire group of individuals, events or objects having a common observable characteristic.

The unit of analysis was the market follower oil companies in Ethiopia. This was taken as the population of the study to analysis factor affecting fuel distribution practices of market follower companies in Ethiopia. Dealers, transporters, and other supportive actors were considered as a target population of the study.

### 3.5. Sampling Technique and Sample Size

A sample is a subset of population to be studied (Marczyk *et al*., 2005; Hyndman, 2008). It is a true representative of the entire population to be studied (Leary, 2001). Similarly sampling is the selection of a subset of individuals from within a population to yield some knowledge about the whole population, especially for the purposes of making predictions based on statistical inference (Scott and Wild, 1986; Black and William, 2004). Its main advantages are cost, speed, accuracy and quality of the data (Ader, *et al*., 2008). A good sample should be truly representative of the population, result in a small sampling error, viable, economical, and systematic, whose results can be applied to a universe with a reasonable level of confidence (Kothari, 2004).

Therefore, in this study all market follower companies (19) in Ethiopia were selected using purposive sampling technique. 15 Dealers ( gas station owners), 10 truck owner transporters in were selected randomly, and other supportive actors were considered as a target population of the study.

### 3.6. Method of data collection

Both primary and secondary data were employed for this study. A structured survey questionnaire was designed and pre-tested to collect the primary data. The questionnaire tried to encompass both closed and open-ended types of questions. Survey questionnaires were needed; for fuel distributor companies. Primary data was obtained from fuel distributors companies in

Ethiopia. The company owner and managers were the main primary data sources. Both quantitative and qualitative data were collected simultaneously during the fieldwork. And also structure check list employed to collect a primary data from dealers, transporters and other supporter fuel value chain actors in the oil industry.

Secondary data was collected by consulting and reviewing different official documents of government organizations like Ethiopian Petroleum supply Enterprise, Ministry of mine , Ministry of trade, published literature, strategic plans, production and consumption data, import forecasts, media reports and government documents. According to Yin (2008), no single source of data has a complete advantage over the others and that the various sources of data collection are highly complementary. This not only increases the validity of the study, but increases the enriching and completes the knowledge and increases scope, depth, and consistency of methodological proceedings (Ghauri and Grønhaug, 2005).

### 3.7. Data analysis

This study employed both descriptive and econometric analysis. The target population of the study composed of all market follower companies and fuel value chain actors in the sector.

#### 3.6.1. Descriptive statistics

To address the first specific objective, descriptive statistical techniques including mean, frequency and percent in terms of tables, graphs and charts.

#### 3.6.2. Multiple Regression Model

The determinant factors affecting fuel distribution practices of market follower companies in the current study, the influences of different determinant factors on fuel distribution practices of market follower companies were quantified using Ordinary Least Squares (OLS). This was done by estimating the slope coefficients. The amount ( volume of sale) fuel distributed of the each company used as the dependent variable. Fuel distribution determinants have been done following the regression technique in linear form. Because a linear regression model different from the logistic regression model is that the outcome variable in linear regression is continuous. Multiple regression analysis is more amenable to ceteris paribus analysis because it allows us to

*explicitly* control for many other factors which simultaneously affect the dependent variable. This is important both for testing economic theories and for evaluating policy effects when we must rely on non experimental data (Gujarati, 2004).

Furthermore, multiple regression models can accommodate many explanatory variables that may be correlated; we can hope to infer causality in cases where simple regression analysis would be misleading. Naturally, if we add more factors to our model that are useful for explaining *y*, then more of the variation in *y* can be explained. Thus, multiple regression analysis can be used to build better models for predicting the dependent variable. An additional advantage of multiple regression analysis is that it can incorporate fairly general functional form relationships. In the simple regression model, only one function of a single explanatory variable can appear in the equation. Finally multiple regression models allow for much more flexibility (J.M. Wooldridge, 2002).

Following (Gujarati, 2004) multiple regression model was applied to identify the determinants of petroleum product distribution of the company.

$$Yi = \beta 0 + \beta 1X1 + \beta 2X1 + \beta 3X3,... + \beta nXn + Ui \qquad (1)$$

Where: Yi = is amounts (sale volume) of fuel distribution per year.

$X_1, X_2, \ldots, X_n$ = the explanatory Variables

$B_0$ = the intercept

$B_1, B_2, \ldots, B_n$ = the coefficient of the parameters (slops)

$U_i$ = the error terms

The existence of multi-co linearity problems was checked before entering the selected variables in to the model in terms of variance inflation factor (VIF) for continuous and contingency coefficients for dummy and discrete variables, respectively. The reason for this is that the existence of multi-co linearity affects seriously the parameter estimates. If multicolinearity turns out to be significant, the simultaneous presence of two variables was attenuate or reinforces the

individual effects of these variables. However, omitting significant interaction terms incorrectly is leads to a specification bias. In a nut shell, the coefficients of the interaction of the variable indicate whether or not one of the two associated variables should be eliminated from model analysis (Kothari, 1990). Each selected continuous explanatory variable ($X_j$) is regressed all the other continuous explanatory variables, the coefficient of determination ($R_j^2$) being constructed in each case. If an approximate linear relationship exists among the explanatory variables then this should show up as a large value for $R_j^2$ in at least one of the test regressions. A popular measure of multi-co linearity associated with the VIF ($X_j$) is defined as:

$$VIF(Xj) = \left(1 - R_j^2\right) - 1$$

Where, $R_j^2$ is the coefficient of multiple determinations when the variable $X_j$ is regressed on the other explanatory variable. A rise in the value of $R_j^2$ that is an increase in the degree of multi-co linearity does indeed lead to an increase in the variances and the standard errors of the OLS estimators. As a rule of the thumb, when the variables having VIF values less than the cut off value (10) is believed to have no multi-co linearity problems and those with VIF of above 10 is assumed to have a multi-co linearity problem (Gujarati, 1995).

Similarly, there may also be interaction between two qualitative variables, which can lead to the problem of high degree of association between two variables. To detect this problem, contingency coefficients was computed from the survey data. The contingency coefficients are compute as follows:

$$C = \sqrt{\frac{X^2}{N + X^2}}$$

Where, C= coefficient of contingency, $X^2$= chi-square random variable and N= total sample size. The problem of heteroskedasticity was checked before entering the selected variables in to the model in terms of two common ways to test for heteroskedasticity: the Breusch-Pagan test and a special case of the White test. Both of these statistics involve regressing the *squared* OLS residuals on either the independent variables (BP) or the fitted and squared fitted values (White).

Heteroskedasticity does not cause bias or inconsistency in the OLS estimators, but the usual standard errors and test statistics are no longer valid. We showed how to compute heteroskedasticity-robust standard errors and *t* statistics, something that is routinely done by many regression packages (J.M. Wooldridge, 2002). In this study endogeneity problem was also checked. Regressions in the presence of correlations between the error term εi and any of the repressors may result a biased estimate. The same holds true if there is reverse causality between the repressors and the dependent variable.

# CHAPTER 4- RESULT AND DISCUSSION

This chapter presents the results obtained from descriptive, value chain and econometric analyses. In the descriptive statistics, mean, percentage and standard deviations were employed. In supply chain analysis description of major actors, function, and relationships among them are presented. Econometric model were also employed to identify factors affecting volume of fuel distributed (marketed) by market follower oil companies in Ethiopia.

## 4.1. Descriptive Analysis Results

### 4.1.1. Demographic characteristics of respondents oil company

The study found out that all the market follower oil companies in Ethiopia engage in downstream activities i.e. distributing of finished products, filling stations etc.

The sample population of market follower oil company respondents handled during the survey was 19. From Table 1, regarding legal forms of business ownership, out of the total interviewed market follower oil companies 57.9 % were private limited company (PLC), 21.1 % were sole proprietorships company, and 21.1 % were share company.

The survey showed that all of respondents had awareness in relation to Ethiopian oil industry before enter in to the industry. However, relating kind of awareness 68.7 %, 26.3% and 5.3% respondents were aware about Ethiopian fuel price and distribution system, price information only and distribution system only respectively. Respondent companies engaged in the business such reasons as high market demand, high market demand and resource availability, high profit margin, resource availability, high market demand and profit margin. The major reason for the greatest proportion of the respondents for entry into the business rest on high market demand ( 31.6 %). Others underlined high market demand and resource availability (26.3%), high profit margin (15.8 %), resource availability (10.5 % ) and high market demand and resource availability (10.5 %) were major driving force in entering the business in deseeding order.

Business experience is taken to be the number of years that an individual was continuously engaged in fuels distribution. It is believed that business experience has a matter on fast and delay oil company decisions or base its decision on the risk taking attitude of the early entry oil companies. The average years of business experience for the sample was about 4.85 years, minimum and maximum business experience of 0 and 18 years, respectively. This shows that most of market follower oil companies were engaged in the industry a few years ago.

**Table 1. Demographic characteristics of respondents oil company**

| Variables | Number ( N=19) | Present |
|---|---|---|
| Legal forms of business ownership | | |
| Private limited Company (Plc) | 4 | 21.1 |
| Sole proprietorships | 11 | 57.9 |
| Share company | 4 | 21.1 |
| Awareness about sector before entry | | |
| Yes | 19 | 100 |
| No | 0 | 0 |
| Reasons for engagement in oil company business | | |
| High demand | 6 | 31.6 |
| Resource suitability | 2 | 10.5 |
| High profit | 3 | 15.8 |
| High demand and profit | 2 | 10.5 |
| High demand and resource suitability | 5 | 26.3 |
| Resource suitability and high demand | 1 | 5.3 |

Source: Survey result, 2018

## 4.1.2. Socio -economic characteristics of respondents

Fuel has a very high contribution for the country's economic and social development. Beside the others importance of Fuel to country economy, creating employment opportunity is a major one. The total number of people working in oil companies is referred to as a created employment opportunity. Creating large number of employment are able to provide labor that might be

required to undertake various oil company and fuels distribution activities. According to the survey results, the average employment opportunity created 39 persons where the minimum and maximum employment opportunity was 7 and 150, respectively (Table 2).

Credit is very important to resource market follower oil companies who cannot finance purchase fuels to distribute petroleum dealers from their own saving . In the study oil companies credit sources that help oil companies to avoid their cash problem with respect to purchasing fuels and other petroleum products. Regarding credit access, the result of this study showed that 100% of respondents reported having access to credit in monthly base from EPSE. Availability of credit access is one of major opportunity in oil industry.

**Table 2. Socio-economic characteristics of respondents**

| Variables | Number ( N=19) | Present |
|---|---|---|
| Employment opportunity | Number ( N= 19) | Standardization |
| | | 49.96 |
| Minimum | 7 | |
| Maximum | 150 | |
| Mean | 39 | |
| Total employment opportunity created | 741 | |
| Fulfilling all country requirements as oil companies | | |
| Yes | 18 | 94.7 |
| No | 1 | 5.3 |
| Type of fuel distribution | | |
| Benzene | 19 | 100 |
| Diesel | 19 | 100 |
| Kerosene | 19 | 100 |
| Jet A1 | - | - |
| LFO | 3 | 15.78 |
| HFO | 2 | 15.89 |
| Access of credit | | |
| Credit | 19 | 100 |
| Cash | 0 | 0 |
| Cost of transportation has effect on fuel distribution | | |
| Yes | 16 | 84.2 |
| No | 3 | 15.8 |

Source: Survey result, 2018

### 4.1.3. Fuel distribution gas stations

Numbers of gas stations are final fuel distribution chain in fuel value chain analysis. Increasing number of gas stations in the country has significant fuel distribution efficiency. According to the survey results, currently 918 gas stations fund in different administrative regions and city of the country, out of these only 291 (31.7 %) gas station were run by market follower companies. Concerning ownership of gas station, 85 and 206 gas stations were owned by company and dealer respectively.

### 4.1.3. Fuel Value Chain Analysis

Value chain analysis assesses the value of each activity which increases the products and services to a firm. The ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage. The competitiveness of value chain is greatly influenced by the partnership and collaboration for innovation that can be realized by chain actors. Moreover, the development and operation of enabling and supporting business development services (e.g. market information, transport, credit) play critical role on how well the value chain responds to consumer demands (Anandajayasekeram and Berhanu, 2009).

Therefore, to enhance opportunities for oil value chain actors, we need to understand the main value chain actors of the entire value chain. At this point, actors involved, the role they have been playing and the prevailing linkage of actors in the oil/ fuel/ value chain is assessed. It is presented in two subsections.

#### *4.1.3.1. Fuel Value Chain*

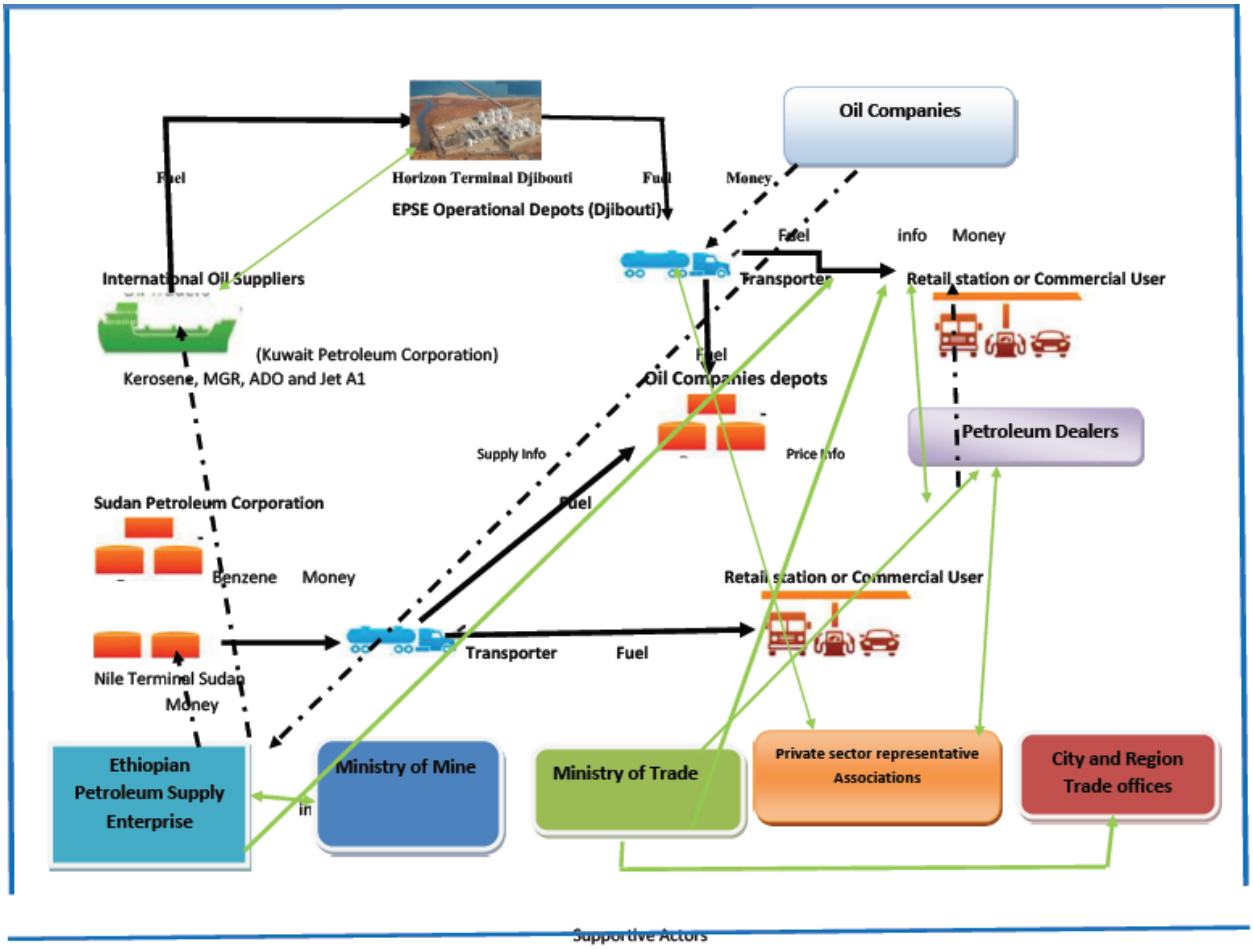
According to McCormick and Schmitz (2002), value chain mapping enables to visualize the flow of the product/service from beginning to ultimate consumer through various actors. It also helps to identify the different actors involved in the fuel value chain, and to understand their roles and linkages.

Hence, fuel value chain map is a graphical representation or snapshot of the various functions in the value chain, key participants/actors/ performing those functions and their dynamic inter-

relationships. Likewise, it is the geographic concentration or dispersion of production, processing, marketing and consumption. Finally, it gives an overview of the location of the distinct stages of a value chain. Accordingly, the current fuel value chain map of the country is indicated in Figure 5.

In addition, the value chain map of fuel integrates the analysis of the value chain actors and that of the associated enabling environments. The map also comprises of the following critical entry points: (a) product and process flow, (b) information and money flow, and (c) the enabling environment. Furthermore, the map integrates both the primary and supportive value chain actors. These actors are elaborated in the subsequent sections.

**Figure 6. Fuel value chain Map**




Source: Survey result, 2018

#### *4.1.3.2. Actors, their role and relationship in fuel value chain*

According to the VCA framework, the actors in the value chain refer to those individuals or entities who engage in a transaction for moving a product from inception to end use. They must exchange money (or an equivalent service) as well as a product, which generally increases in value with each transaction (Campbell, 2008). Since Ethiopia does not produce oil, to meet the country's oil requirement, the country imports fuels from abroad. A typical oil value chain begins with the crude oil producer, next, the oil moves to the refiner, the transporter, the retailer/dealer/ and finally to the gas pump where a customer receives the product.

Based on the survey result the primary fuels value chain actors are those functions which have directly involved in the purchase and supply, marketing, and distribution of the fuel. These actors are international oil suppliers (International petroleum Supplier Company or corporation), national petroleum/fuel/ purchaser and supplier, oil/petroleum companies, Transporters, petroleum dealer and ultimate consumers.

Whereas the supportive actors are not directly involved in purchase and movement of the product, these actors have significant impact on the quality, efficiency of supply and distribution. Support activities serve as the value chain's enabling environment. These actors are finance providers, research centers, federal government offices, regions administrators, NGOs and the like. Actors and their role are described as follows:

##### *4.1.3.2.1. Direct fuel/oil/ value chain actors*

**International Oil /suppliers/ Traders:** They supply oil through an international open tender process. Fuel value chain function starts from international oil supplier. Since Ethiopia is a land locked county and does not produce oil, it is necessary to use as intermediate storage terminal of the countries through which the oil is imported. The countries Gasoline consumption is purchased from Sudan and loaded from Nile Petroleum Terminal whilst the rest of the product is imported via Djibouti port and stored at before it enters into the country. Horizon Terminal is operated by to Horizon Terminal Limited (HTL) and owned by ENOC. The terminal is located at

Doraleh village, which is 10 kilometers from Djibouti Port, strategically located on the Red Sea. It provides service to both Djibouti and Ethiopia.

Currently, there are two international oil companies (Sudan Petroleum Corporation (SPC) and Kuwait Petroleum Corporation (KPC) are supply oil/ fuels/ to Ethiopian petroleum supply Enterprise.

**Ethiopian petroleum supply enterprise:** EPSE is a government agency which is licensed by MoMPNGas a bulk supplier. EPSE imports fuels, stores and sells petroleum products to Oil Companies. It was established in 2012 by the Council of Ministers Regulation No. 265/2012. It is an amalgamation of the Ethiopian Petroleum Enterprise (EPE) and the National Petroleum Reserve Depot Administration (NPRDA).

The EPE, established in 1995, was the sole entity established to meet the country's demand for petroleum, with the exception of liquefied petroleum gas (LPG), bitumen products, and lubricants. The NPRDA established in 1997, was an autonomous institution responsible for overseeing Ethiopia's petroleum reserves to maintain the regular petroleum supply in case of interruption or shortage (Fortune, 2015).

Besides being the sole importer of fuel into the country, EPSE has a plan to build 160 retail stations across the country and involve in retailing fuel to public, to resolve the occasional shortage of petroleum (Oil Review Africa, 2015).

**Oil Companies (Bulk distributors):** These companies have been licensed by the MoT as oil companies or bulk distributors. They purchase oil from EPSE at Djibouti and Sudan and distribute the fuels either through their dealers or direct to commercial customers. Currently, according to the collected data there are 24 Oil Companies are registered but 23 oil companies are running the business; namely Oil Libya, Total, National Oil Ethiopia (NOC), YPB, Kobil, TAF, Nile Petroleum, Waybit, Wadi Alsundus (WAS), Dallol, Olway, Gomeju, Yeshi, Getnet, Belen, Zagole, Ertale, Muluge, Tebarek, Halefaye, Calub, Habesha, JR, Kernel petroleum company.

Oil Companies are the main actors who perform most of the value chain functions right from, fulfilling minimum national requirements as bulk fuel distributors ( have two gas stations, 500,000 MT capacity one depot, etc ), preparation of their oil tankers/depots/, constriction of their gas stations, selection and engaged agreement with oil transporters and petroleum dealers, purchase of MGR (Benzene), ADO (Motor Diesel), Kerosene, Heavy Fuel Oil (HFO), Light Fuel Oil (LFO) and bulk distribution to the petroleum dealer or direct sale to commercial customers. According to rule of Ethiopian Ministry of Trade, Oil Companies cannot distribute fuels directly to ultimate individual customers, they supply to legally registered petroleum dealers. Currently, on the base of their annual volume of sale, such oil companies as Oil Libya, Total, National Oil Ethiopia (NOC) and YBP are market leaders, and the rest are followers.

Regarding type of product they distribute, the result of this study showed that 100% of respondents are distributing three types of fuels (Benzene, Motor Diesel and Kerosene). None of them are distributing Jet-Fuel. Specifically, among 19 sample respondents 3 of them (TAF, Gomeju and Habesha) are distributing LFO whereas; HFO sold by only two companies (Yeshi PLC and Kobil).

According to focus group discussion with sample oil companies, participant respondents said that EPSE are provide credit facility to oil companies during purchase of fuels monthly base.

**Transporters (truck owners)**: transporters are major value chain actors in oil industry. According to Ethiopian transporters association, there are around 2,500 transporters are engaged in oil industry. Since Ethiopia is a land locked county and does not produce oil, it is necessary to use as intermediate storage terminal of the countries through which the oil is imported. The countries Gasoline consumption is purchased from Sudan Petroleum Corporation and loaded from Nile Petroleum Terminal whilst the rest of the product is imported via Djibouti port and stored at Horizon Terminal before it enters the country. This is therefore; oil companies have transportation agreement with truck owners. On base of this agreement and on behalf of oil companies, transporters receive and carry imported fuels from EPSE storage terminal /tankers/ depots/ transport to a place where the oil company gas stations are fund. Fuels depots of EPSE are located at Djibouti and Sudan terminal.

Currently, the truck owners explained that the main road from port Tajura to Ethiopian boarder is damaged due to these trucks spends much more hours than normal hours. The maintenance cost of the truck ever increased due to these problems. During the rainy season, this causes flooding and makes a road impassable. 10 owners of the truck surveyed for this study. According to survey result 85 % of transport owners stated that the first and most challenge of the transporters is low fixed profit margin. The road damage is the second challenges of transporters.

**Petroleum dealers (Retailers):** petroleum dealers are established by trade law. they purchase fuels from oil companies and resale to general public user through fuel /gas / station and sell to bulk commercial customers. Dealers have distribution agreement with oil companies in order to represent the oil companies. These sighed distribution agreement serves as a base for business relationship between Oil companies and dealers. There are more than 600 petroleum dealers were established in the country with the aim of increasing direct distribution of fuels and other petroleum products to ultimate consumers. On base of gas station ownership right there are two type of Dealer Company owned and dealer operated or dealer owned and dealer operated. Among these, more than 100 petroleum dealers are a member of Ethiopian petroleum dealers association. For this study, 15 dealers were survey from the association member and non-member dealers and had discussion with board director of Ethiopian petroleum deals association.

According to the survey result, dealers the existence of petroleum dealers in fuel value chain has two functions. Initially, dealers perform as direct actors who purchase fuels from oil companies by adding transport and other costs and then distribute it to both direct individual consumers and other buyers. Secondly, dealers are acting as indirect actors of fuel value chain that has a building gas stations in throughout the country, employing both professional workers, labors etc in this fuel value chain dealers are largely contribute to oil industry (sector) development.

Like other fuel value chain actors (Oil companies and transporters) dealers distribute flues on fixed profit margin which is determined (fixed) by Ministry of trade this is therefore dealers have no room to increase the selling price of fuels in order to raise their profit margin.

According survey result 95 % of sample respondents answered exiting fixed profit margin has direct negative effect on their fuels distribution and indirect effect on the country oil industry development. Whereas 5 % sample respondents answered that if the government adjust other indirect cost such as rent cost of gas station from company owned gas station, cost of transport from the source fuels, land lease price to be the owner of land for the construction of new gas station etc , the current fixed profit margin may not have effect on their distribution.

During the group discussion with board director of Ethiopian petroleum dealers association, board directors mentioned that the below listed problems are major challenges (in order of importance) that ender the fuel distribution efficiency of dealers.

- ✓ **Low profit margin**: 0.07 Ethiopian cents per fuel litter is the exciting government fixed profit margin of petroleum dealer. In another way, dealers pointed out that if they distributed 45,000 litter of fuels to customers there have got 3,500 birr profit (0.04 %) including the cost incurred.

- ✓ **Temperature and density measurement problem:** Dealers have explained that these problem was creating during receiving of fuels from the trucks, which is according to the distribution agreement between oil companies and dealers the receiving temperature measure of the environment has to be at 20 $^{0}$C but these sub-article of agreement has not been practiced due to these dealers are exposed to unnecessary costs.

- ✓ **Transport trucks calibration problem** : dealers have pointed out that the current fuels transport trucks calibration system is obsolete (using water instead of fuel, wood than scientific tube, long time interval of calibration, etc). Thus, dealers could not get the actual amount of fuels corresponding to the cost incurred.

- ✓ **Fuels dispenser pump machines calibration problem and standard :** Dealers have been underlined that irregularities in the measurement of fuels pumped by the dispenser machine is due to long time interval of calibration by responsible government body and lack of national dispenser pump machine standards to use this as base for machine import.

- ✓ **Lack of credit facility :** oil industry is one of key economic sector of the country and also dealers are major actor of oil industry value chain but dealers have mentioned that there is no priority on credit access when they faced cash shortage during purchase of flues from oil companies.

- ✓ **Less integrated government services and facilities :** dealers pointed out that so as to run fuel distribution smoothly they have been contacting less integrated government offices ( MoT, MoE, Electricity, Investment office, land administration etc) because of these problem dealers are force to spend more time and cost.

- ✓ **Lack of consistence capacity building training and consultation :** Dealers believed that continues short term capacity building training and consultation on type and quality analysis fuels, how to check fuel tanks and dispenser pump machines are run according to the calibration, safety and environment etc have contribute on smoothing fuels distributions and oil industry development as whole. However, dealers pointed out that there is no such kind of training on consistence base.

**Ultimate Customers (user) and commercial customers:** based on the survey result, the majority of individual users prefer to buy fuels whenever they need from particular gas stations because of their convenience. Rarely do individual user gas stations around to find a cheaper price and less long queues at gas stations source for their fuels. Frequently, among three type of fuels Benzene is most demanded and the choice of the users. Commercial customers are an institution/organizations who are buy fuels in bulk and stores its own storage facility. They are not instant user like individual user. According to discussion with individual users and commercial customers they pointed out that the major problem they faced are waiting a long queues at gas stations, absence of their preference type of fuels, very expensive fuel unit price of , sometime an availability of fuels in most gas stations due to this they are forced to travel long distance to search fuels around city, inconvenience of gas station, some time absence of power in gas stations etc are major challenges they faced in fuel value chain.

#### 4.1.3.1.2. The enabling environment / supporting actors/ indirect actors

The enabling environment consists of the critical factors and trends that are shaping the value chain environment and operating conditions, but that may be amenable to change. The purpose of charting this enabling environment is not simply to map the status quo, but to understand the trends that are affecting the entire value chain and to examine the powers and interests that are driving change.

**Ministry of Mines, Petroleum and Natural Gas (**MoMPNG): Until recently, the oversight of the oil and natural gas sector was split between ministries. The Ministry of Mines was responsible for upstream issues, including the allocation of exploration and production areas. The Ministry of Water Resources, Irrigation and Energy was responsible for downstream activities related to the use of domestic and imported fuels.

The consolidation of upstream and downstream activities under the MoMPNG provides the opportunity to adopt and implement a comprehensive strategy for the sector under a sector master plan (The World Bank, January 2016).

**Ministry of Trade (MoT):** The MoT was re-established in August 1995 under the proclamation No. 4/1995. The Ministry was again reorganized with a proclamation No. 619/2003. The main objectives of the ministry are to ensure a modern fair trading practices. The ministry has three main responsibilities:

a) Provides a trade license for Oil Companies and dealers (fuel station operators).
b) Regulates and establish the price of fuel in the country by preparing a price build up that shows the price structure from purchasing price at Djibouti and Sudan up to the pumping price at the station. The price build-up is used by all stakeholders involved in the marketing and distribution process (including transport rate to be paid to Bulk Road Vehicles).
c) Calibrates Bulk Road Vehicles and dispensing pumps/meters installed at depots and stations.

The Ministry retains regulation of the entry of fuels marketing firms in the downstream sector. It requires the Oil Company to construct a depot that can store a minimum of 500,000 liters and have a minimum of 6 filling stations before issuing a license to operate as oil distributor in Ethiopia. Although, the requirement is not implemented strictly.

**Private Sector Associations :** They are representative of the private sectors in organized manner and establishes under the proclamation No. 341/1995 with the objectives of increasing private sectors' voice in organized way in the whole value chain, to advocacy and lobby the sector policies issues, to dialogue with government on sectors challenges, facilitating in sector technology transfer, facilitating and providing training and consultation to members, creating national and international plat form to expose members etc.

For this study two associations were included in group discussion namely Ethiopian Petroleum dealers Association and Ethiopian transporters (Truck) owners Association. According to group discussion a board members pointed out that associations had study on sector challenges and submitted to responsible government offices and waiting the government response. Furthermore, They have been raised the sectors challenges during different time government and public meetings.

### 4.2. Econometrics Model Analysis Results

The econometric model analysis was intended to examine factors affecting volume of fuels distributed. There are a number of determinants that influence oil companies' volume of fuel distributed. Ahead of moving to the multiple linear regression analysis, problems associated with OLS were tested. The most essential analytical tests in OLS are multicollininearity, heteroscedasticity and specification was conducted.

Furthermore, the problem of heteroscedasticity is always common and expected when analyzing cross-sectional data (Gujarati 2004). However, this study tested the existence of heteroscedasticity by employing Breusch- Pagan test using STATA command hettest. Hence, tests showed that there was no heteroscedasticity problem. Correspondingly, detection of specification error for omitted variables test result also showed that there were no omitted variables and specification error.

In this study, among 10 variables hypothesized in the model, 4 variables were found significant determinants of volume of fuel distributed. These variables were access to market information, dealers owned gas station, credit utilization and distance from fuels source. Regarding relationship of the variables with the volume of fuel distributed, access to market information, dealers owned gas station, credit utilization had positive relationship where as distance from fuels source had negative relationship. The overall model result is stated in table 3.

**Table 3. Determinants of the volume of fuel distribution**

| | | |
|---|---|---|
| | | F( 10, 8) = 11.08 |
| | | Prob > F = 0.0012 |
| | | $R^2$ = 0.9327 |
| | | Adjusted $R^2$ = 0.8485 |
| | | Root MSE = 4756 |
| **Volume of petroleum sold** | **Coefficient** | **Std. Err.** |
| Distance from sources | -12205.83** | 4694.716 |
| Company owned gas station | -5572.745 | 3353.576 |
| Access to market information | 3151.069** | 1145.339 |
| Number of tanks or depot | 2071.056 | 3758.799 |
| Dealer owned gas stations | 1241.222*** | 235.0651 |
| Credit utilization | 878.8066** | 375.6131 |
| Profit margin | -47.68274 | 468.3884 |
| Infrastructure | -17.78917 | 17.55929 |
| Number of employee | 31.54868 | 52.74782 |
| Legal ownership of the company | -1242.144 | 2417.495 |
| _cons | 30831.74 | 22495.81 |

*,** and *** at 10%, 5% and 1% Significance level respectively

Source: Survey result, 2018

A linear regression model was fitted to estimate the effects of the hypothesized explanatory variables on the average annual volume of fuel sale. The stata's output of linear regression contains Prob > F, R square and adjusted $R^2$ results. F statistics (11, 7) is the mean square model divided by the mean square residual, yielding F = 8.82. The number in the parentheses is the model and residual degrees of freedom are from the ANOVA table. The Prob > F is the p value

associated with the above F statistics. It is used in testing the null hypothesis that all of the model coefficients are 0. R square is the proportion of variance in the dependent variable which can be explained by the independent variable. R squared of 0.9327 implies 93.27% of the variation is explained by the regression and the rest is due to error. Adjusted R squared corrects for the number of independent variables and is preferred to R squared. Adjusted R squared value greater than 0.5 is considered good in economics. This is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable is associated with dependent variables. Adjusted R square is an adjustment of the R squared that penalizes the addition of extraneous predictors to the model. Adjusted R square is computed using the formula (1 – Rsq) (N -1) / (N – k – 1) where k is the number of predictors.

After all tests, the 10 explanatory variables were entered into linear regression analysis. Looking at the results confirms that most of the explanatory variables in the model have the signs that conform to our prior expectations. Among variables fitted into the model, distance from sources, access to market information, dealer owned gas station and credit utilization were found to be significant in determining fuel distribution at different level of probability (table).

In this model, there are ten predictors, so there are ten degrees of freedom. Of all variables entered in the model, four variables were found to be the significant determinants of the annual volume of petroleum sale with up to 10% level of probability. These variables includes distance from sources (at $P < 5$ %), access to market information (at $P < 5$ %), dealer owned gas station (at $P < 1$ %) and credit utilization (at $P < 5$ %) were found to be significant whereas, the rest six variables were found to have no significant influence on annual volume of petroleum sale. In light of the above summarized model results, possible explanations for each significant independent variable are given hereunder.

**Distance from fuel source:** As can be hypothesized, the continuous variable distance from the source is found to affect annual volume of fuel distributed in the domestic market negatively and significantly (at $P < 5$ %). Holding all other variables constant, for every a unit increase in kilometer of the distance, 12, 205 metric tons of sales volume decline would be predicted. EPSE rent five depots in Djibouti to use as operational depots until supply (sale) to oil companies. This is therefore oil companies fuel procurement is done at Djibouti operational depots and Sudan.

The possible justification for this is the sources' being far from the distribution gas stations along with unfavorable road makes timely supply very challenging for the oil companies. Furthermore, it forces them to incur extra costs through truck maintenance and truck drivers per diem.

**Market information:** It is a continuous variable referring to frequency of information obtained from Ministry of Trade and EPSE about price and supply (quota) of fuel respectively. The coefficient of frequency in accessing market information was found to be positive and statistically significant at (at P < 1 %). Oil companies market decision are based on a price fixed information by MoT, poorly integrated price and supply information may convey inaccurate decision, leading to temporary fuel distribution scarcity and creating unnecessary vehicle line at the gas station. Easy and timely access for market information allows companies to make easy decision and facilitate the entire marketing system.

**Number of dealer owned gas station:** Gas stations owned by dealers as a continuous variable was hypothesized to have positive influence on the company's volume of fuels sold annually. In agreement with the hypothesis, its coefficient came out to be positive and statistically significant (at P < 1 %). The coefficient of dealer owned gas station is 1241.22. So for every unit increase in the number of gas stations owned by dealers, we expect a 1241 metric tons increment in the annual volume of sale, keeping all other factors constant. The possible explanation was when dealers own gas stations, they might have greatest sense of responsiveness, have the right to increase fuel dispensing pump machine and other services, and able to change their design and reconstruct than company owned stations.

**Credit utilization:** As a continuous explanatory variable, credit utilization refers to the amount of credit taken by oil companies from Ethiopian petroleum Supply Enterprise (EPSE). Consistent with the earlier proposition, the model result revealed the important role of amount of credit in expanding the volume sale positively (at p < 1%). The coefficient indicates that if amount of credit taken in terms of ETB increases by a unit, volume of sale would be enlarged by 878 metric tons. The industry is capital intensive. EPSE is the only source of credit in kind to give fuel to the oil companies in a monthly basis. The next credit is allowed only when repayment is fulfilled. And the oil companies in turn provide fuel in credit for some loyal commercial customers. Therefore, it will sometimes be difficult for the oil companies to collect the credit for

re imbursement. So, there would be a problem in the foregoing transactions. Generally, shortage of credit access affects the domestic supply directly, as in the case of scarcity of collected cash and indirectly, pushing oil companies to shift their capital investment for fuels purchase. The poor credit facility ultimately hinders expansion of oil companies.

# CHAPTER 5- SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1. Summary and Conclusions

### Summary

This study sought to examine the major determinants of fuel distribution in Ethiopia taking the Case of Market Follower companies with specific objectives of identifying fuel value chain actors and their roles, examining the function of actors in the chain and analyzing the determinants of volume of fuel distributed in Ethiopia.

The data were generated from both primary and secondary sources. The primary data was generated from individual oil companies interview using pre-tested semi-structured questionnaire and structured-checklist was used interview other fuel value chain actors. The primary data for this study were purposively collected from all market follower oil companies in Ethiopia. Regarding, other fuel value chain actors 15 dealers (gas stations) and 10 truck transporters were randomly selected. Furthermore, 20 fuel consumers were selected using systematic random sampling.

The analysis was made using descriptive statistics and econometric model using STATA software. Multiple linear regression model was applied to analyze factors affecting the volume of fuel distributed in the study oil companies. For the analysis, 10 explanatory variables were entered in the model. Out of these, 4 variables (utilization of credit, number of dealers owned gas station, access to market information and distance from fuel source) were found to be significant up to 1% level of probability.

### Conclusions

The findings of this study found evidence that the main fuel value chain actors were International fuel suppliers, EPSE, Oil companies, Truck Transporters, fuel dealers, Individual and commercial user/consumers. There are also governmental and non-governmental organization

supportive actors who support fuel value chain indirectly. This includes MoE, MoT, Private sector association, EPSE, Regional trade office, government truck calibration services delivery offices and other service providers.

Out of the 600 gas stations (company owned or dealer owned) run throughout the country, the study result revealed that 67.53 % and 32.47 % were found to be dealer owned and company owned gas stations respectively. Besides, Ethiopian petroleum dealers association is one of the private representative associations in fuel value chain in Ethiopia.

In this study, 95 % of sample respondents confirmed that the exiting fixed profit margin has direct negative effect on fuel distribution. Generally, the fixed profit margin was found to be a major bottleneck for petroleum dealers. Furthermore, low profit margin, temperature and density measurement problem, transport truck calibration problem, fuel dispenser pump machines calibration problem, absence of dispenser pump machines national standard, shortage of credit facility, less integrated circulated government institutes services providers and facilities, and lack of continues capacity building training has been identified as major challenges that render expansion of gas stations (dealers).

Similarly, truck owner transporters were one of the major actors in fuel value chain in Ethiopian. According to Ethiopian transporters association, there were around 2,500 transporters engaged in fuel industry. On the basis of the agreements between truck owner transporters and Oil Company, transporters receive and carry imported fuel from EPSE storage terminal /tankers/ depots/ transport to a place where the oil company gas stations were found. Fuels depots of EPSE were located at the terminals of Djibouti and Sudan.

On the other hand, 85 % of transport owners realized that the major challenge of transporters was the low fixed profit margin. Since the main road from port Tajura to the boarder of Ethiopia is damaged, trucks spend too much hours. Accordingly, the maintenance cost of trucks dramatically rose. And it was found to be the second challenges of transporters and truck owners.

The study further realized that lack of unified and strong governmental coordination office, poor information sharing and coordination among the value chain actors, low profit margin for fuel

value chain actors ( Oil companies , dealers, and transporters, poor and delayed truck calibration system, poor contract agreement enforcement (informal agreement b/n oil companies and dealers), shortage of credit facility, lack of national standard for fuel dispensing pump machine, road problem, lack of responsible body on implementation of truck $T^0$ and density measurement unit (20 $C^{0)}$, shortage of training and advise for petroleum dealer were found to be the major challenges along the fuel value chain.

The econometric model analysis also revealed that utilization of credit, numbers of dealers owned gas station, access to market information were found to influence the volume of fuel distributed in Ethiopia positively and significantly. Contrary to this, distance from fuel source had shown negative and significant relationship with volume of fuel distributed.

Hence, these variables require special attention if volume of fuel distributed is to be increased thereby increase their fuel distribution market share and improve the benefit ( profit ) of market follower oil companies in Ethiopia.

### 5.2. Recommendations

Based on the descriptive and econometric analysis results, the following short term and long term recommendations were forwarded. Given the significant potential of the sector to the development of the economy apart from being source of income (profit) generation for oil companies and meeting ever increasing demand of fuel, results of this study have important implications for fuel value chain development in Ethiopia.

As immediate solutions, improving the coordination and collaboration effort among actors, MoT and EPSE should have a regular meeting to discuss openly and transparently on the entire market and supply information, chain problem and development program, and then make decisions jointly. In the long run, government should establish a strong and committed office which will be responsible and accountable in creation of coordination and collaboration among fuel value chain actors.

MoT should revise profit margin of oil companies, petroleum dealers and transporters that was fixed 3 years ago. Besides, the government should create special credit facility for oil companies and petroleum dealers. MoT, on the other hand, should take an immediate action in making the most often used informal agreement b/n companies and dealers to formal contract.

MoT should take responsibility to enforce Ethiopian Standard Agency in developing fuel dispensing pump machine national standard. MoT should modernize truck calibration methods the responsible body should implement and enforce oil companies to distribute oil with the previous 20 $^{0}$C temperature and density.

The results of econometric analysis indicated that volume of fuel distributed is positively and significantly affected by utilization of credit. Thus, viable credit market could be strengthened to encourage the market follower oil companies to procure more fuel, to facilitate their market access, to expand their number of gas station particularly in regions cities and to improve their fuel distribution capacity. Thus, there is a need for policy and institutional arrangements to develop new credit access than the existing bank system.

Number of dealer owned gas station also positively and significantly affects volume of fuel distribution. Gas station is the final value chain of fuel distribution and supporting in increasing number of gas satiations directly improve uninterrupted fuel distribution to the individual users and commercial customers thereby increasing the sale volume of fuel distribution. Therefore, the government should facilitate and speed up the land a question process, give special priority on foreign currency for importing raw materials which are need for the construction of new gas stations, make available and arrange special land lease price for the building of new gas station throughout the country and emerging cities too.

The volume of fuel distribution is negatively and significantly affected by distance from fuel source (supply). The closer distance of the sources to distribution gas stations reduces cost of transportation and minimizes time needed to transport. Consequently, the more volume of fuel would be distributed. Therefore, in the long run, construction plan of pipeline should be implemented by responsible government bodies. And as an immediate solution for this problem, the MoT should revise the current fixed transport cost. Moreover, the government should give

urgent solution to the damaged road from Djibouti terminal (EPSE operational depots) to the boarder of Ethiopian.

Market information also positively and significantly affects the volume of fuel distribution. Market and supply related information had a great impact on the volume of fuel distributed. Therefore, price, supply and other market information providers should take in to account the effect of market information on the volume of fuel distribution. Moreover, market information should be provided in a well organized way and attention should be given for easy accesses thereby increase the volume of fuel distribution.

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## APPENDICES

### Appendices A. Questionnaire – Market follower Oil Companies

### Instructions:

Dear respondents, to provide proper information to the questionnaire you are kindly requested to provided short and brief answer for the open ended questions and, circle your response for the multiple choice questions

**GENERAL INFORMATION**

Date of Interview---------- Code No----------

Name of the enumerator (Interviewer) ----------

Name and responsibility of Respondent ---------- and ----------

Date of data checked ----------

**1. DEMOGRAPHICS CHARACTERISTICS OF THE COMPANY**

1. Name of the company ----------
2. Company location ; City ---------- Sub-city ----------
3. How long have you been in petroleum products distribution? ----------Years
4. Legal ownership of the company 1. Sole 2. Partnership 3. Share company
   4. Others specify ----------
5. Educational level of the owner ----------Years
6. Sex of the owner; 1. Male 2. Female
7. Current total number of employee ----------

**2: SOCIO-ECONOMIC CHARACTERISTICS ON SUPPLY AND DISTRIBUTION SIDE OF OIL COMPANY**

1. Why your company engage in petroleum products distribution business ?
   1. High demand 2. resource suitability
   3. High profit margin 4. Other reasons, specify ----------

2. Did your company have awareness about petroleum products and distribution system of the country before entering the business?

1. Yes 2. No

3. If yes, what kind of knowledge (awareness) did you have as a company?

1. Type and quality of petroleum products 3. Price information

2. Distribution system 4. Other reasons, specify ----------

4. What are the requirements your company did fulfill as petroleum products distributor ( oil company) ? ----------

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5. Do you think your company is fulfilling all country requirements as petroleum products distributor (oil company)? 1. Yes 2. No

6.If no, what are un-fulfilling requirements?----------

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7. The source ( supply) of petroleum products?

1. Ethiopian petroleum supply enterprise 2. Other oil companies

3. Other sources,----------

8. What service did you get from Ethiopian petroleum supply enterprise( supplier)? ----------

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9. Distance from source ---------- km

10. What type of petroleum products did your company purchase ?

1. Gasoline 2. kerosene 3. diesel 4. liquefied petroleum gas

11. How did you get? 1. Cash 2.Credit 3. Others (specify) ----------

12. Who determine buying price? ----------

13. What kind ( mode) of transport do you use? ----------

14. Who determine cost of transport ?

1. Owner of the transport 2. Company 3. Others (specify) ----------

15. Cost per liter/minimal unit of measurement ----------

17. Is there any problem relating to transportation facilities? 1. Yes 2. No

18. If yes, what are the problems?----------

19. Your company annual petroleum products distribution capacity

A. Gasoline---------- B. kerosene ----------

C. Diesel ---------- D. liquefied petroleum gas ----------

E. Other ----------

20. Did you get enough amount and type's of petroleum products as your company need/demand/? 1. Yes 2. No

21. If no, what are these possible reasons?

1. High price 2. No credit facilities 3. Limited supply

4. Quality problem 5. Others (specify) ----------

22. Is there any problem relating to petroleum products supply? 1. Yes 2. No

23. If yes, what are these problems?----------

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24. Current actual annual distribution

A. Gasoline----------

B. kerosene ----------

C. diesel ----------

D. liquefied petroleum gas ----------

E. Other ----------

25. Are you distributing immediately after purchasing ? 1. Yes 2. No

26. If no, how long have you kept it before distributing it? ----------

27. Why you kept it? ----------

28. Do you have storage facilities in your company? 1. Yes 2. No

29. If no, where do you store? Specify ----------

30. Do your company have enough petroleum products storage facility ? 1. Yes 2. No

31. If no, what are reason behind?----------

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32. Number of petroleum products storage facility (tank) throughout the country ----------

33. The storage capacity of each tank (depot) ----------

34. Is there any problem relating to storage facilities? 1. Yes 2. No

35. If yes, what are these problems?----------

36. To whom you distribute petroleum products ? (multiple answer is possible)

1. Individual consumer 2. Petroleum dialers

3. Other oil company 4. Other (specify) ----------

37. What is the reason you selected to distribute to the one selected in #33?

1. Pays high price than others 2. Low transportation cost

3. Frequent purchase 4. Government rule 5. If others, please specify: ----------

38. How many depots do you have ( including Jet-A1) ?----------

39. How many depots do you have for ground fuels (AGO,MGR,KEROSINE and ETHANL)----

---------- Where is the location----------,----------,----------

39.1. Tank capacity of MGR----------MC

39.2. Tank capacity of AGO----------MC

39.2. Tank capacity of KERO----------MC

39.2. Tank capacity of ETHANOL ----------MC

40. Did your company have own gas station? 1. Yes 2. No

41. If yes, the number of gas station by region

| No | Regions | Number of gas station | Average distance from market( consumer ) | Number of petroleum dispenser pump at each gas station | Average storage capacity of each gas station depot |
|---|---|---|---|---|---|
| 1 | Addis Ababa | | | | |
| 2 | Afar | | | | |
| 3 | Amhara | | | | |
| 4 | Benishangul-Gumuz | | | | |
| 5 | Dire Dawa | | | | |
| 6 | Gambela | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Harari | | | | |
| 8 | Oromia | | | | |
| 9 | Somali | | | | |
| 10 | SNNPs | | | | |
| 11 | Tigray | | | | |

42. If your answer is No for number 40 question, what are reason behind?----------

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43. How many trucks do you have ? ----------

44. Total land holding (available) for all gas station ---------- M2.

45. Do your company has a capacity and resource to distribute fuel ( petroleum products) requirement promptly ?

1. Yes 2. No

46. If no, what are problems?----------

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47. Who determine price? 1. Government 2. Company 3. Other (specify) ----------

48. What is the unit selling price of petroleum products?

A. Gasoline----------

B. Kerosene ----------

C. Diesel ----------

D. Liquefied petroleum gas ----------

49. Do you think fixed selling price of petroleum products has effect on distribution ?

1. Yes 2. No

50. If yes, would you like to explain the effect of fixed selling price on distribution ----------

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51. Do you think company leadership structure has effect performance of distribution?

1. Yes 2. No

52. If yes, would you like to explain the effect of company leadership structure on distribution

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53.Do you think power shortage and inconsistency have effect performance of distribution?

54. If yes, would you like to explain the effect ----------

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**3: ACCESS TO INFORMATION, FINANCE AND INFRASTRUCTURE**

1. Did you get any kind of information in relation to petroleum product distribution ?

1. Yes 2. No

2. If yes, who provides ?

1. MoT 2. EPSE 3. MoT. 4. Others (specify) ----------

3. What type of information did you get?

1. Price 2. Supply information 3. Credit use 4. Others----------

4. How frequent did you get information ?

1. Every-day 2. Every week 3. Every month 4. Every three months

5.Two time a year 6. Others (specify) ----------

5. Did you get credit in relation to petroleum product distribution ? 1. Yes 2. No

6. Have you received credit in relation to petroleum product distribution last two/three production years? 1. Yes 2. No

7. How much did you borrow and used ?

| Year | Amount | What activities did you use |
|---|---|---|
| --- | --- | --- |
| --- | --- | --- |

8. If your answer for #6 is no, what are /were the reasons?

1. Not available 2. Lack of collateral

3. The interest rate is very high 4. Others, specify ----------

9. Is there any problem in relating credit utilization? 1. Yes 2. No

10. If yes, what are these problems?----------

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11. Do you think the sector infrastructures has effect performance of distribution?

1. Yes 2. No

12. If yes, would you like to list the major infrastructures ?----------

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## 4. Open-ended general questions

1. What are the major problems (challenges) of the oil industry (sector) and petroleum products distribution in the country? Specify in order of importance

- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------

2. What are the existing good opportunities that encourage oil sector (industry) and petroleum product distribution in the country?

- ✓ ----------
- ✓ ----------
- ✓ ----------

- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------

3. What possible solutions you will recommend for the challenges of oil sector ?

- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------
- ✓ ----------

4. What kind of support or facilities did you get from government and other responsible bodies to upgrade the current oil sector and petroleum product distribution supply chain in the country ?

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**5. Perception questions**

1. Whom do you think benefits more from petroleum product distribution in the country?

1. Oil company 2. Petroleum dealer 3. Supplier 4. Others----------

2. Whom do you think contributes more to petroleum product distribution?

1. Oil company 2. Petroleum dealer 3. Supplier 4. Others----------

## Thank you so much for responding to the questions!!!

**AppendixB- Product Imported in to the country**

| Year | Gasoline | JET/Kerosene | Gasoil | LFO | HFO |
|---|---|---|---|---|---|
| 1997 | 122,995 | 252,302 | 557,640 | 107,576 | 0 |
| 1998 | 135,469 | 238,836 | 542,936 | 96,025 | 0 |
| 1999 | 142,526 | 224,177 | 548,787 | 61,566 | 54,954 |
| 2000 | 129,964 | 225,431 | 610,835 | 49,149 | 61,973 |
| 2001 | 133,111 | 259,786 | 623,197 | 40,688 | 80,894 |
| 2002 | 148,555 | 259,786 | 679,281 | 41,865 | 93,804 |
| 2003 | 130,416 | 294,699 | 688,527 | 40,770 | 90,078 |
| 2004 | 146,094 | 334,638 | 773,256 | 43,185 | 110,048 |
| 2005 | 137,193 | 370,401 | 811,689 | 41,521 | 117,198 |
| 2006 | 143,743 | 402,311 | 905,478 | 42,255 | 116,429 |
| 2007 | 139,093 | 482,173 | 1,073,148 | 49,692 | 138,059 |
| 2008 | 150,099 | 506,497 | 1,203,567 | 36,421 | 116,506 |
| 2009 | 155,806 | 529,857 | 1,237,922 | 10,714 | 100,967 |
| 2010 | 143,882 | 549,224 | 1,183,266 | 34,353 | 97,191 |
| 2011 | 146,670 | 535,304 | 1,206,216 | 36,492 | 107,964 |
| 2012 | 195,661 | 619,532 | 1,351,428 | 37,509 | 131,068 |
| 2013 | 212,802 | 707,761 | 1,537,319 | 38,286 | 125,187 |
| 2014 | 237,870 | 712,637 | 1,703,230 | 40,633 | 127,907 |
| 2015 | 308,035 | 735,348 | 1,930,539 | 37,858 | 71,023 |

**AppendixC- Research methods**