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**DEPARTMENT OF MANAGEMENT EXECUTIVE MBA
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Liquid Cargo Transport Performance Assessment: The Case of National Oil Ethiopia – (NOC)

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**Liquid Cargo Transport Performance Assessment: The Case of National Oil
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Declaration

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

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Certification

This is to certify that Fekade Tilahun Haile has done a study on the topic “Liquid Cargo Transport Performance Assessment: The Case of National Oil Ethiopia – (NOC)”. This study is his original work and all the sources of materials used for the thesis had been duly acknowledged.

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Acronyms

EPSE: Ethiopian Petroleum Supply Enterprise.

KPI: Key Performance Indicator

NOC: National Oil Ethiopia plc.

MOT: Ministry of Trade

Abstract

The road transport industry is by far the most predominant mode and backbone of the Ethiopian economy handling over 97% of domestic freight as stated in the Federal Republic of Ethiopia's National Transport Master Plan study. Though it is a major focus of government regulatory activity, the Federal Road Transport Authority is not supervising the operation of liquid cargo transporters. This study is aimed at assessing the Liquid Cargo Transport performance in the case of National oil Ethiopia (NOC) Ethiopia. The purpose is to identify gap, constraints that affects liquid cargo transporters performance and which eventually affects the Oil Company. The research design employed is descriptive-cross-sectional which has a decisive role for quality research. In such a way, the researcher has selected a survey method and information has collected from 90 respondents from both NOC employees and transporters. The study indicates the elements identified in the research showed that they are crucial for the transporter performance. It also showed that National Oil Ethiopia and its outsourced Liquid cargo transporters have to work together so that both to be beneficial. The little emphasis given to one of the elements that is Safety Management by the transporter is a reflection of the attitude of most companies in the country. The business case for safety need to be understood by all stakeholders. Therefore, partnership mentality is needed to address the transporter performance issues which is within the hand of the National Oil Ethiopia and its Outsourced liquid cargo transporters. Apart from that government need to address the issues that affect liquid cargo transporters before it affects the supply chain of fuel in the country.

Chapter 1: Introduction

This thesis examines the liquid cargo transportation process mainly from the outsourced transporter perspective and lightly from the oil company perspective. This chapter is organized in seven sections. It provides background information, motivation of the study and statement of the problem. The research questions and objective are presented in the fifth and sixth section respectively. Section seven discusses scope and limitation of the study.

1.1 Background of the Study

The Oil and Gas Industry is divided into the three main categories and they are called the Upstream, Midstream & Downstream. Downstream mainly concentrate on refining crude oil and it also involves marketing and distribution of refined products. Some of the refined products are Gasoil, Motor Gas Regular, Kerosene, JetA1, bitumen etc. (Ecom Instrumnets, 2018).

Fuel is distributed through petroleum pipeline, railway and fuel tankers. Pipeline and railway operations are cheaper but the initial investment is high. Road transport using fuel tankers is more flexible and access stations and customer sites located even at remote location. Combination of the different mode of fuel transport operation is necessary to ensure sustainable fuel supply at reduced cost. Nowadays the most used freight transport mode is road transport since it can take various loads which cannot be entertained by other types of transporting method (South Africa Trasnport Ministry, 2017).

Currently the downstream oil infrastructure of Ethiopia, consist of only storage and distributing to retail network and consumer sites as the refinery in Assab ceased to operate in 1995 (Ethiopian Petroleum Supply Enterprise, 2017). Supply of Fuel to Ethiopia started a century ago after the construction of Addis Ababa- Djibouti railway as per the EPSE document published for 50th anniversary of the establishment of the organization. However the structured downstream oil supply chain management that is regulated by the government can be linked with the establishment of the refinery in Assab in the year 1976.

The transport service plays a major role to countries overall development and in Ethiopia the road transport sector handles over 97% of the country's domestic freight economy as stated in the Federal Republic of Ethiopia's National Transport Master Plan study (Afro Consult & Trading, 2010).

Governments used to control transportation directly or through regulation but this trend is decreasing and gives room for competitiveness (Shirisha, 2014). The Federal Road Transport Authority is the regulatory body which oversees the overall freight transportation operation. In May 1992, proclamation 14/1992, deregulated the freight transport sector which was totally controlled by the then Ethiopian Freight Transport Corporation as published by the Addis Ababa Chamber of Commerce & Sectorial Association (ACCSA, 2009). In Ethiopia, most of the road transport operations from Djibouti is being handled by independent transport associations and transport companies. Currently the sector is highly competitive and it regulates itself as per the prevailing market condition.

The Oil companies in Ethiopia are mainly engaged in storing and distributing of oil products in their retail network and for consumption of direct users or commercial customers. Oil companies in Ethiopia are highly dependent on the liquid cargo transport associations and transport companies' performance. The competitiveness of Oil Company, on fuel business, largely depends on the professionalism level of its outsourced transport contractors and proper logistics planning of the oil company. National Oil Ethiopia (NOC) which is established in April 2004 is one of the major oil companies and commands 32% of market share of the oil sector (NOC, 2017). It operates using more than 180 service stations and ever increasing commercial customers. To supply fuel to its customers it uses more than 1000 subcontracted vehicles which are operating under more than 70 transport associations and transport companies.

Unlike other freight cargo operation, the road transport related to Fuel liquid cargo transportation is working as per fixed rate set by the Federal Transport Authority and Ministry of Trade where contracted transporters work under the existing oil companies which distribute fuel products in the country. The transport payment is function of the distance and the type of road i.e. paved or gravel. Paved and gravel roads have pre-determined fixed rate set by the government, but the cost incurred by transporter when assigned to hilly route and flat road for the same distance is incomparable.

Delivering refined fuel products with the right quantity and quality plays significant role in customer satisfaction. However when one strive to achieve these goals, it has to try to minimize its cost and organization of efficient logistics is crucial to achieve this goal. The travelling distance of the route and the time that is taken by the driver and the vehicle are significant factors in incurring cost (Sear, 1993) . Road Transport contractors' efficiency is

dependent on driver efficiency and vehicle efficiency (Arvidsson, Jan 2013). The World Bank study suggests also road transport effectiveness and efficiency is affected by low level of professionalism and vehicle status (World Bank & IRU, 2016).

According to ASEAN (2014), “Unless an organization measures the desired outputs one cannot expect to improve the inputs. Measuring effectiveness and efficiency is the gauge of our actions and decisions” (p.20).

1.2 Statement of the Problem

Shirisha (2014) states that Transportation is required in the whole logistics operation processes and it comprises around 33% cost of logistics. Its performance is directly related to logistics performance of the organization. “In case of most industries, logistics helps to optimize the existing production and distribution processes based on the similar resources through management techniques for promoting the efficiency and competitiveness of enterprises” Shirisha (2014, p 14). Likewise National Oil Ethiopia’s (NOC) competitiveness and efficiency shall improve if the subcontracted transporters efficiency improves which will result in satisfied customers and more orders are generated which will be beneficial to all stakeholders.

In Ethiopia, The government directive restricts oil companies not to operate using their own fleet to distribute fuel products therefore they have outsourced the transport service to third parties. These directives helped the oil companies as suggested in several literatures to focus on their core business. (Ugwu, 2014)

Tough the transport operations is outsourced and is run by the transport contractors the transporter’s fleet operate in accordance to the oil companies dispatch schedule. It is the task of the logistics function of the oil companies to dispatch each individual trucks. This requires assigning of all the trucks in fair and transparent way which directly affects the performance of the transporter since transport payment is based on the kilometer travelled and the type of road whether it is paved or gravel and does not consider the type of terrain hilly or flat land. This huge task is not always consistent and is also subjective. It is the source of dispute between the transporters and the oil companies and sometimes becomes a hindrance to operate smoothly as the number of distributing points increase to satisfy the ever increasing fuel demand across the county which also requires managing more vehicles.

Allowing transporters to maximize their performance helps the company as well as the transporters. Whenever there is fleet shortage in the country due to restriction of importations of new vehicles by the government there is a tendency of transport companies migrating from one oil company to other oil company though they have a long term contract. As per the researcher experience in 2016 new oil companies entered to the oil distribution market in Ethiopia and attracted vehicles from the major oil companies which consequently affected the market share of major oil companies as they were not able to deliver products to their customer, which can be seen from EPSE monthly loading data by oil companies. In 2015 the market share of major oil companies was 88% and declined to 84% in 2016 and further deteriorated to 75% in 2017.

1.3 Motivation for of the Study

The main motivation of this research paper is the transporters complaint on the rate applied by the government and which is not reviewed regularly. The liquid cargo transporters association in conjunction with Transport Authority of Ethiopia had studied, four years ago, that tariff for transportation of fuel is not adequate and driving them to bankruptcy. The delay in response from a higher government body make them to express their grievance in every opportunity acquired. It is mainly vented out in monthly meeting of stakeholders which is conducted by the ministry of Mines and Petroleum. Recently they have threatened the authorities that they would stop operation unless an action is taken. The researcher who is working in the industry believed that there are ways to improve the performance of the transporter if both the oil companies and the outsourced contractors work as being partner for their mutual benefit.

1.4 Rational of the Study

Studies indicated that there is a room for improvement in the liquid cargo transportation business and if properly managed and monitored it will be beneficial both to the oil companies and the transport contractors. Fugate (2010) also stated that success in performance of logistics (transportation) operation is connected to improved performance of the company.

In Ethiopia the information related to liquid transportation activities is very limited, indicating that they cannot be adequate enough in establishing adequate operational performance in the liquid cargo transportation process in the country. This study will be an

effort to examine liquid cargo transportation performance and identify the challenges and opportunities and address the gaps that affect both the oil company and the transporter. Thus, the oil industry in the country gain maximally from their Cargo transportation practices.

1.5 Research Questions

The research questions to address the main topic of this research that is liquid cargo transport performance assessment: The case of National Oil Ethiopia-(NOC) are listed below.

- What are the reasons, benefits and challenges of outsourcing liquid cargo transportation in National Oil Ethiopia (NOC)?
- What element of transportation activity is more influential in for better performance liquid cargo Transporter Company?
- What are the areas where outsourced transporters and oil companies improve logistics performance so that both benefit from the business?

1.6 Objectives of the study

1.6.1 General Objective of the study

The overall objective of this study was, therefore, to evaluate the liquid cargo transporters performance and the challenges associated with maximizing the utilization of the fleet of National oil Ethiopia (NOC).

1.6.2 Specific Objectives of the study

The general objective of the present study was assessed through the following specific objectives:

- To identify the reasons, benefits and challenges of outsourcing that affect liquid cargo transportation in National Oil Ethiopia (NOC).
- To determine the relative importance of transportation element that that determines better performance of liquid cargo transporter.
- To examine how transporters and oil companies coordinate to improve logistics performance of both parties.

1.7 Scope and Limitation of the study

This study was conducted on liquid cargo transportation and Oil Company outsourcing of this function. It is a case study on National Oil Ethiopia and out sourced transporters which may also give service to other Oil companies. The study did not encompass other oil company transporters though there are similarities in some cases and is limited only on liquid cargo transport. The other limitation is lack of previous researches and written documents on liquid cargo transportation therefore similar tasks of dry cargo transportation elements are referred to address the issue. Most research papers are available on logistics and not one of its major component, i.e. transportation by trucking companies.

Chapter 2: Literature Review

This chapter reflects the transportation management process where the arguments about outsourcing, performance monitoring key performance indicators discussed. The second part presents the elements of liquid cargo transportation in the downstream business of fuel products road transportation. The conceptual framework is also included at the end of this chapter.

2.1 Transportation in Logistics

Logistics is defined in several ways, in this paper it is preferred to use the definition described by the Council of Supply Chain Management Professionals (CSCMP)

“Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management, supply /demand planning, and management of third party logistics services providers.” (CSCMP, 2013, p.1)

History of logistics shows that it is always changing and its contribution to the organization performance and success of organization is largely dependent on its role (Rushton, 2010). It improves the existing process of an organization having similar resources by changing only the management capability and capacity of its logistics function so that the organization competitiveness improves (Tseng, 2004). Logistics is viewed differently by various groups and differently as some restrict its meaning to transport management while other groups extend its meaning to the whole supply management. (UNECE, 2008)

Tseng (2004) argues that transport is involved in every activity of logistics process. It explains by saying that it is needed in different production points, and in distributing products to end users. Its importance is also can be linked as it comprises large part of logistics process.

The UN presentation in September 2008 on study “Supply Chain Challenge of Transport” the following points are raised and to support the point the data in Fig 1 is used. Fourteen percent of global GDP is in logistics, its contribution to product cost is estimated 10 to 15% and the direct transportation cost is around twenty to thirty percent of logistics costs. It also states competitiveness in the business is a function for efficient movement of freight.

Table 2.1: Logistics as % of GDP (UNECE, 2008)

Country	GDP in US \$m	Logistics in US \$ m	% of GDP
Mexico	334,726	49,753	14.9
Ireland	67,392	9,611	14.2
Singapore	94,063	13,074	13.9
Hong Kong	153,068	20,992	13.7
Germany	2,352,472	306,264	13.0
Taiwan	273,440	35,686	13.0
Denmark	174,237	22,440	12.8
Portugal	101,182	12,871	12.7
Canada	585,105	70,191	12.0
Japan	4,599,706	522,982	11.3
Netherlands	392,550	44,495	11.3
Italy	1,214,272	137,027	11.2
UK	1,151,348	122,344	10.6
US	7,576,100	795,265	10.5

One of the contributing factor for logistics growth is the improved efficiency of the operations of transportation. In transportation the use of road and road transport plays the major role in terms of reaching customers timely. Transportation system is the key element in amount in the logistics costs and transportation systems influence the performance of logistics system hugely. Transporting is required in the whole production procedures, from manufacturing to delivery to the final consumers and returns (Rushton, 2010).

All organizations use transportation to operate their business. The pillar of logistics is transportation management in terms of the satisfaction of the customer by delivering the required product. Routing & Scheduling, fleet size and vehicle standard should be coordinated to have a good transportation management.

“The point is that every organization, be it manufacturer or service provider, for-profit or non-profit, has customers that it wants to reach. By integrating the appropriate functions into a customer-focused logistics system, the enterprise can develop a sustainable advantage that is very difficult to be imitated by a competitor. Some of these activities have traditionally had a well-defined stand-alone role within a

company (purchasing, production, information processing), while others have generally been more closely associated with logistics (transportation, warehousing, packaging). What ties all of these functions together is their ability to improve customer satisfaction. This is not to say that production, for example, should be subordinate to logistics. Rather top management should utilize logistics as a way to integrate these corporate activities and keep them focused on the customer rather than on internal processes” (Shirisha, 2014, p.15).

Road Transport sector need to be helped to reach to its potential so that it addresses fully the challenges it faces in operation. Transport companies profitability depends on the efficiency of the transportation process. Reliability, speed and flexibility are key factors for success. (World Bank, 2009).

2.2 Outsourcing Transportation

Outsourcing can simply be defined as contracting someone or some organization to run some parts of one’s business. It helps organization to acquire capability in terms of service and expertise. Certainly is extending the organizational capability without significant investment. Focusing on core business and cutting cost is the main advantage of outsourcing (www.chrisducker.com).

In “Coping Strategy for Outsourcing Services to Third Party Logistics Providers” Ugwu (2014) presented two arguments, where the first one is by Laarhoven (2000) , that outsourcing main advantage is reducing cost and on the other hand the argument by Wilding (2004) the primary focus of organization is service and not cost. He continued his argument by stating that from the elements of the motive of outsourcing that are cost reduction, activity coordination, improving quality, core competence and strategic flexibility only one is cost related.

Outsourcing has its own advantage and disadvantage. Hand book of Logistics suggests that there is a tradeoff between cost and quality service. The main advantage is reducing or avoiding capital cost and in terms of transport the asset that is the fleet is not owned by the company it is the duty of the outsourced service provider to acquire and maintain the vehicles and handle the day to day operation related to drivers and customers. In transportation drivers and vehicles are the most important element to manage cost and service. However if the outsourcing company losses control over the process of distributing it may affect the customer therefore performance monitoring measurement is necessary. Distribution operation

allow its task to be totally outsourced or partially outsourced but the main factor is the outsourcing organization has to define which function to keep in house. Transportation management may use the whole fleet that is outsourced through a long term contract (Rushton, 2010).

A list of the key drivers for outsourcing can be seen from a survey conducted by a survey Eye for Transport in 2005 show that the most important elements in outsourcing are reducing cost and increasing customer satisfaction (Eye for Transport, 2005). Manganga (2015) stated in a research on Zimbabwean outsourced transport company “An investigation into factors that influenced the performance of Zimbabwean third party logistics firms specializing in transnational road cargo haulage services”, the trucking industry is underperforming in giving quality service to its customers and is characterized by low profit margins, high rate of delays, longer turnaround time. Outsourcing may also create dissatisfied customers due to bad performance of the outsourced transporter. Therefore the need to monitor the performance of the outsourced functions is a must in order to take full advantage of the benefits of outsourcing and as well to limit the potential risk that might happen due to outsourcing.

2.3 Performance Monitoring

“Measurement is the first step that leads to control and eventually to improvement. If you can’t measure something, you can’t understand it. If you can’t understand it, you can’t control it. If you can’t control it, you can’t improve it.” H. James Harrington (Smith, 2010, p.1)

Measuring performance is critical in a company which is trying to realize its goal and its purpose mostly related to know if customer satisfaction is achieved, finding areas of improvement, to make fact related decisions and check the realized plan. Performance measurement is a method of addressing the efficiency and effectiveness of an action. Performance measurement is one of the required competency of logistics (Gunasekaran, 2007).

The role of logistics performance measurement is also researched by Fugate (2010) and concluded that its improved performance is related to improved organizational performance. There are also other literatures that stress the importance of performance measurement. However the key performance indicators need to be designed to the objective of the organization.

Cost and performance monitoring need to be designed in such way that it reflects the business objectives and the day to day operational activities. Therefore one has to be aware of the context of logistics performance monitoring should be focused with the overall the organizational objective. There are several way to monitor performance like historical data, scientific standards, external standards and bench marking (Rushton, 2010). Historical data uses to measure year by year performance which is good for monitoring but does not tell the cost incurred to achieve the performance. Budget vs. plan is also a tool to measure the detailed performance compared to the actual performance. Other monitoring tools like engineering standards are cited in the hand book of logistics and distribution where time and work study is involved. Well organized transporters may determine their cost and monitor their activity to standard or measured times which will give them the driving time, the loading and discharging time etc. that determines the journey or the trip duration. Bench marking is also useful as it is “another approach to cost and performance measurement is to make comparisons against industry norms. The intention here is that a company’s performance can be compared to similar external operations and standards, making comparison more realistic and therefore more valuable” (Rushton, 2010, p.475). Bench marking is good also in creating competition in the industry and particularly among the out sourced transporters that can be translated to design a rewarding mechanism.

Table 2.2 – Types of Bench Marking (Allan Rushton, 2010)

Objectives	Without benchmarking	With bench marking
Becoming competitive	Internally focused	Understanding of competition
	Evolutionary change	Ideas from proven practices
Industry best practices	Few solutions	Many solutions
	Frantic catch-up activity	Superior performance
Defining customer requirements	Based on history or gut feeling	Market reality
	Perception	Objective evaluation
Establishing effective goals and objectives	Lacking external focus	Credible, unarguable
	Reactive	Proactive
Developing true measures of productivity	Pursuing pet projects	Solving real problems
	Strengths and weaknesses not understood	Understanding outputs
	Route of least resistance Based on	Based on Industry best practice

2.4 Fuel Cargo transportation in downstream business

The Oil and Gas Industry is broadly divided into upstream, and downstream. Downstream is involved in refining and distributing of the refined product in to the market. The process starts by refining crude oil and refining it to refined products. Marketing and distribution of

the product is done by several oil companies. These oil companies vary in size where some of them owns the crude and the refinery while others purchase and distribute to the user through their network (Sear, 1993).

Customers mainly look for the cheaper product, in terms of fuel sales the brand does not matter that much, customers perceive refined products as commodity goods with there being little difference between brands and so the cheapest supplier is sought. Consequently, the industry is considered as very competitive and the selling price is pushed downwards in the retail business. Though selling price is governed by the market, cost reduction, product quality and reliable distribution are pillars for customer satisfaction.

“The key opportunity for cost minimization is the planning of efficient logistics chains. In the downstream market forecasting is often based on a simple extrapolation of growth rates experienced over the past few years, paying attention to geographical variations” (Sear, 1993, p.9)

In Ethiopia, regarding fuel products the government of Ethiopia through Ethiopian petroleum supply enterprise (EPSE) sells by credit to the existing 24 oil companies which then distributes to their outlets that are retail service stations and commercial sites. The purchase price is fixed as well as the selling price and purchasing price is set by ministry of trade which is reviewed monthly. The oil companies have the option of choosing their transport companies. The contract lasts for 3-5 years and is indirectly regulated by the Government. At the moment all liquid cargo is transported by road tankers.

Some other future options for liquid cargo transport are using rail and pipelines. Transporting fuel by rail tanker may be possible in the near future to Awash, where an existing bulk store is available as part of the operational and strategic depot for Ethiopia. This depot is situated close to the railway. In addition a direct pipeline may be possible in the distance future, but (ACCSA, 2009) claims this requires huge investment.

2.5 Factors that affect Liquid Cargo Transport Companies

Road Transport plays a large and costly part in the distribution of petroleum products especially in the final delivery from depots to retail outlets and customer sites. Transport companies have to find ways to reduce cost in conjunction of Oil companies order management.

“A good road transport operator who knows his costs is an asset to and a vital member of a marketing company team insofar as his input is necessary to determine what the strategy should be in obtaining sales” (Shell Petroleum company Limited, 1993, p 323)

According to (Ivana Simkova, 2015) Transport KPI cover 6 areas like, cost, operation, service, compliance and maintenance. Measurement of these are important but it depends on the relevancy and appropriateness to the given transport operation. Since most of the operation are fixed in transportation of fuel in Ethiopia like, no alternate route, fixed transport rate, only full load delivery, will force us to focus our study on the main issues related to these factors. These are drivers, vehicles, trip, order, scheduling and safety which can be improved by the transporter and Oil Company

The basic factors which are pertinent to the success of the day to day operation are;

- I. Driver utilization – Productive hours versus total shift hours
- II. Vehicle utilization- actual hours used (productive) versus total hours available
- III. The total quantity delivered per vehicle and the distance travelled.

They are related to idle time, waiting time, out of service time, inefficient dispatching, quicker round- trip times which is affected by improved loading & discharge rates, running speeds and documentation processing time.

Many downstream multi nationals set standards for liquid cargo transportation and the below factors are extracted from Shell Distribution manual. (Shell Petroleum company Limited, 1993)

2.5.1 Driver Management

Drivers has the ability to make the transport company profitable provided they have good vehicle management by the company and effective control system. “Hiring just one unsatisfactory driver can result in a loss to a fleet. So it’s a worthwhile investment to spend time upfront to select the best qualified drivers.” (The Hartford Financial Services Group, 2015, p. 5). A transport company need to have a standard procedure which defines the driving hour, working time and rest time. As per multinational oil companies standard that a driver has to drive for a maximum of 9 hours on the wheel and has to take rest for and continue its journey which is limited by 12 hours working time. Professional driving is just like any other job where it has a defined rules. Once a week the driver has to take rest for 36 hours.

However many transporters argue that the vehicle is not utilized well and driver is taking too much rest but the actual fact on the ground shows that computer monitored vehicles show that an average of 5 hours driving is done in 24 hours as per the researcher experience.

Human Resource is the major contributing factor to the success of any organization and in case of Transport Company drivers are the main players in utilizing the main asset that is vehicle to the maximum benefit of the transport company. However there are conflicting interests between the interest of the driver and owner of the vehicle unless there is a defined procedure to monitor the activity and also proper engagement to maximize the potential of the driver.

In addition to the above in liquid cargo transportation drivers are willing to work only to destination that are hotter than 20°C as they are loaded with standard 20°C at the loading point. They discharge at observed temperature of the discharging site that gives the opportunity to siphon product on the road which seems excess of the loaded quantity. This affects the efficiency of the driver and the utilization of the vehicles. Therefore proper driver management procedures have to be implemented by the transport company.

The drivers on the other hand are an untapped source of knowledge. No one in the organization is more familiar with the road conditions, traffic flow and density, vehicle performance, customer facilities and constraints. Therefore a motivating scheme encourages them to use their knowledge to reduce costs and improve delivery services. It should also incorporate or be linked to safe driving factor so that drivers are not encouraged to drive beyond safety limits.

“The Driver Shortage, a perennial top industry issue, ranked as the industry’s top concern for the second consecutive year in 2018. Growing demand for truck transportation over the past year has exacerbated industry capacity constraints as carriers continue to struggle with recruiting and retaining a qualified truck driver workforce.” (The American Transportation Research Institute, 2018, p.6).

2.5.2 Vehicle Management

The most costly asset in transport management is the vehicle. The basis of efficient fleet operation is the correct selection and application of the vehicles to the work they are expected to perform. If a vehicle is wrong for the job its cost of operation can be much higher than it should be because of lower productivity, driver antipathy, higher maintenance and service

time. The main aim of the transporter is to do the work in the least time at lower cost. To achieve these the selection of the right equipment requires knowledge and analysis of the work to be done like the delivery distance, size and nature of payload, topography, climate, road surface condition, maintenance facilities. A combination of preventive maintenance programs with unit replacement arrangements minimizes the need for enlarged repair shops. Poor reporting by drivers to mechanics, and failure to consult shop records, lead to waste of man and vehicle time before troubles are isolated and eliminated.

The principal measurements for vehicle fleets are usually,

- vehicle availability,
- vehicle utilization,
- work performance (quantity carries per trip, Distance run per trip, Time on road per trip, Time in depot and at customers per trip),
- fuel consumption efficiency and
- Maintenance efficiency.

Therefore vehicle performance and keeping record of maintenance and analyzing the data is very important for the profitability of the transport company. Fitting onboard computer on the vehicles is a good tool to monitor. “Efficiency is measured differently in every industry. For trucking, maximizing equipment utilization is the key to increased profitability. Measure your Vehicle usage verses idle time to determine productivity levels” (Accutrac Capital , 2017, p.1)

2.5.3 Safety Management

In the downstream oil and gas business road accidents dominate the fatality statistics. The main area of concern is the high level of third party fatalities associated with bulk fuel tanker accidents although company and transporter fatalities at an unacceptability high level. Implementation of road transport safety management system provides systematic business driven approach to the management of road safety with risks minimized and competently managed. Road safety is a challenge for which there are no easy solutions but which needs to be actively managed in the same way as other business activities. It requires commitment from the top.

One thing outsourced transporters fail to see to implement efficient safety management is not recognizing the financial cost due to unmanaged safety practice. The truck and the driver will

be out of work due to accident which means no income to the transporter and as well the recovery from insurance does not cover the lost business. In addition to these the lengthy legal process coming from the incidents is costly as well and divert attention from focusing on the main business.

2.5.4 Journey/Trip Management

At operation level the transport management effort should be directed towards controlling the day to day performance of individual vehicle , driver, orders , truck assignment and as well as managing the trip plan of the driver. Drivers are reluctant to plan the trip ahead after loading the product. Rest place, rest time and driving hour need to be planned in advance. The transporter has to monitor using GPS and if not available with log book. Data from on board computers shows that there is excessive idle time and the vehicles are not utilized as they are designed to operate. Nine hours driving time is allowed by multinational oil companies however the actual fact in Ethiopia is that the driving hour is only five hours.

2.5.5 Scheduling/Dispatching

In any dispatching system the dispatcher is the key man between the customer ordering and the delivery of product. The scheduler matches the generated order with the available vehicle. If a vehicle went in its pervious trip to non-preferred route it has to be compensated with preferred route. However this may not match since the available order in the day is the major determining factor for truck assignment.

2.6 Conceptual Framework

Conceptual framework shows how the researcher analyze the literature review and describe how it is related to his research and is a blueprint which also adds his knowledge and observation on the subject matter (SimplyEducate.me, 2012).

In the literature reviewed it is shown that transport is the major component of logistics and it can be related that good transport performance contributes to superior organizational performance (Fugate, 2010).

According to Arvidsson (2013) the two major activities where transport organization can do to improve their performance is improving efficiency of drivers and vehicles. The drivers affect the trip/Journey, safety and vehicle efficiency is affected by the maintenance, scheduling plan etc.

In Ethiopia, fuel cargo transportation is outsourced by the oil companies to transport companies and scheduling/dispatching done by oil companies themselves. The distribution of fuel cargo is in the current system in practiced in a way that the oil companies has some pre-determined routes or clusters of cities that can be serviced by the road tank trucks which are waiting to be loaded at Djibouti or Sudan . The schedulers determines the daily distribution plans according to the orders generated by customer service.

The transporters operate as per fixed transport rate based on the km travelled to whatever terrain they are delivering product. The researcher tries to correlate the unique situations in Ethiopia to the literatures reviewed and his experience and come up with the model shown in Fig 1. Assessing the outsourced logistics performance and the scheduling/dispatching of vehicles by the oil companies will give an input to further study to standardize the process and give direction to regulatory bodies to improve the overall industry practice.

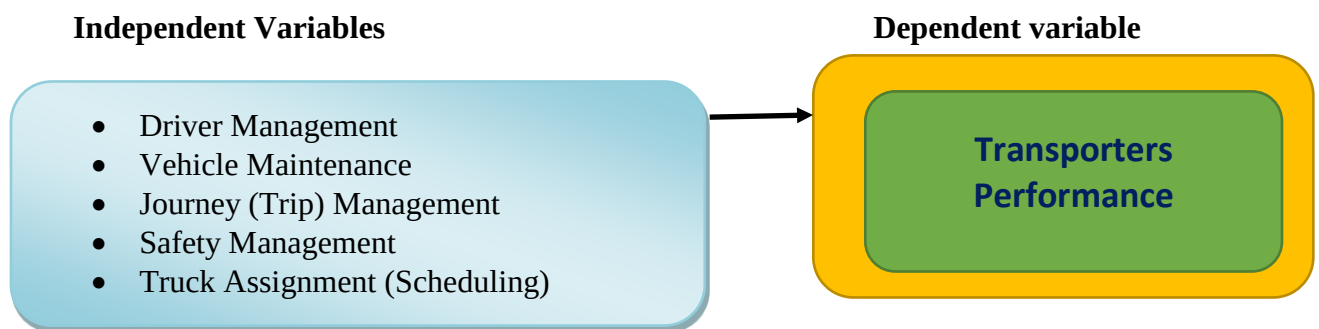


Fig 2.1 Conceptual Framework Model (Author's Construct based on the literature reviewed)

Chapter 3: Research Methodology

This chapter discusses the underlying principles of research methodology and design. The purpose is to choose the appropriate research methods for the study.

3.1 Research Design

The main objective of this study was to evaluate the liquid cargo performance and the challenges associated with maximizing fleet utilization. This study used descriptive research design to obtain information about the performance assessment liquid Cargo Transport system taking the National Oil Ethiopia (NOC) as a case. The researcher selected a cross sectional survey and the research is both descriptive and explanatory in nature. “Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation.” (Key, 2002). Moreover, it enables close association between the different variables under study while ensuring assumption for the result obtained by the researchers, hence the most appropriate for this study.

3.2 Data Type and Source

It is becoming increasingly popular that combinations of methods are to be employed in research. It is usual for researchers to employ mixed method designs to investigate different aspects of the same phenomenon (Sarantakos, 2013). Data for the purpose was collected from both primary and secondary sources. Secondary sources included mainly published and unpublished sources, such as annual reports of the company, including monthly EPSE product uplift report and National Oil Company of Ethiopia (NOC) monthly performance of outsourced transporters and a literature review was also used to complement and refine the information that would be collected. On the other hand, the primary source included interview with transporters, focus group discussions.

3.3 Data Collection

3.3.1 Methods

This research employ both qualitative and quantitative types of data. “Qualitative data refers to all nonnumeric data or data that have not been quantified and can be a product of all

research strategies” (Saunders, 2009) whereas quantitative data is that involves numerical data. This data is also classified additionally as primary and secondary data.

3.3.2 Sample Size

For quantitative data the questioners, to collect information about a target population, is used. The purpose is confirm the findings of the qualitative research. To determine the size of the participants, general rule of thumb not less than 50 participants for correlation or regression is used (Morgan, 2007). In this regard, the total numbers of target population which are working in relevant position of NOC Ethiopia and all liquid cargo transporters have been considered.

Therefore, 70 transporters are used for the survey which is the total number of transporters working for NOC due to their small number all are included and intended to get reliable data on the mater. The relevant number of NOC staff that are working in logistics and marketing are 30. Since 5 of them are working out of the country in Djibouti all the remaining 25 were considered to give their perception on outsourcing of the transportation part of the business. Furthermore, 3 key interviewers from both sides have been involved so as to find detailed information on the issues.

3.3.3 Data Gathering

The researcher has arranged convenient time by consulting participants to avoid any possible inconveniences. The questionnaire was distributed and collected at a time and plenty of time was given to understand and respond each question. The empirical research component of the study contained questionnaire. The study employed a questioner with 5-point Likert-type scale that ranged from strongly disagree to strongly agree. It was pretested to see its simplicity and understandable before it is sent to participants.

3.4 Methods of Data Analysis

The main objective of this research is to assess Liquid Cargo Transportation Performance: The Case of NOC Ethiopia. SPSS 20 software was used to process data collected from the questionnaire. Based on the questioner results and other interview question the focus group discussion will analyze the sectors issues.

3.5 Ethical Consideration

National Oil Company Management positions, logistics, sales and marketing staffs and related position to the issue were approached in person for their corporation in data collection. Prior to the data collection, all respondents were told that the response they provided will be confidential and be used only for the study purpose. The data is collected after assuring the consent of the respondents.

Furthermore, participants were informed that participation is voluntary and that they are not obliged to answer to any questions if they are not comfortable about it. They were also been told that they can withdraw at any time they want. Names or personal identifiers were not included in the written questionnaires to ensure participants' confidentiality. Thus, during the interview and group discussion, we did not force anyone to answer the entire questionnaire and that all personal information of the respondents is confidential

Chapter 4: Data Analysis, Results and Discussion

In this chapter results related to main findings addressing the objectives of the study. Graphs, tables, simple comparison were also employed to see if there is a significant difference to some variables. Thus, the insights offered below should be viewed as an indicator results to stimulate discussion on the performance of outsourcing liquid cargo transportation of National Oil Ethiopia (NOC), and in other companies with the same conceptual framework.

This chapter presents the research findings through data analysis and presentation of the research findings. It begins with demographic data of the research responses, age, sex, experience and the findings are in line with research objectives and research variables demonstrating the relationship among the various variables.

4.1 Response Rate

Table 4.1: Response Rate

Category		No. of Respondents category	Percentage (%) %
Distributed	NOC Employees	25	26.3
	Transporters	70	73.7
	Total	95	100
Collected	NOC Employees	23	92
	Transporters	67	95.7
	Total	90	94.7

(Source: survey, 2018)

Regarding response rate as portrayed in table 3, the questionnaires were dispatched for 70 transporters and 25 NOC employees. Out of that, 2 questionnaires of employees and 3 of questionnaires of transporters found to be invalid. Therefore, the response rate is 94.7%. Consequently, the analysis has been done on the responses of valid questionnaires.

4.2 Characteristics of Respondents

The characteristics of respondents from both companies profiled in some details in the remainder of the questionnaire, particularly characteristics such as sex, age , education, and duration in the company were collected at the survey time and analyzed as per the below table.

Table 4.2: Characteristics of respondents

Variables	Category	Number	Percentage (%)
Sex	Male	84	93
	Female	6	7
	Total	90	100
Age	18-29	28	31
	30-45	47	52
	46-60	12	13
	Above 60	3	3
	Total	90	100
Education	High School & below	43	48
	Diploma/Certificate	24	27
	BA/BSc	21	23
	MA/MSc	2	2
	Total	90	100
Duration in the company/Business	Less than a year	2	2
	1-3 years	22	24
	3-5 years	26	29
	Above 5 years	40	44
	Total	90	100

(Source: survey, 2018)

From the table it is evident that 84 out of 90 (93%) respondents were male while 6 (7%) are female. This implies that the transport sector is dominated by male

Table 4.2 shows that 28 (31%) of the respondents were aged between 18 – 29 years, 47 (52%) aged 30 - 45 years and 12 (13%) aged 46 – 60 years and 3 which is 3% is above 60. This indicates that majority of the respondents were aged between 30 – 45 years.

The study also sought to establish the education level of the respondents. The findings as shown in Table 4 above indicate that 43 out of 90 (48%) have High School certificate or below educational level. This shows the majority have a lower level of education in relation to the current Ethiopia graduates number.

Results on the years of service in current employment/business revealed that majority of the respondent 40 (44%) had worked for more than 5 years which shows that the respondents are aware of the transport business of liquid cargo transportation.

4.3 Reliability and Validity

Reliability of a measure refers to the consistency and validity of a given sample. “Internal consistency reliability is a measure of consistency between different items of the same construct. If a multiple-item construct measure is administered to respondents, the extent to which respondents rate those items in a similar manner is a reflection of internal consistency. This reliability can be estimated in terms of average inter-item correlation, average item-to-total correlation, or more commonly, Cronbach’s alpha.” (Bhattacharjee, 2012). For a test to be internally consistent, estimates of reliability are based on the average inter correlations among all the single items within a test. Alpha value ranges between 0 and 1. (Joseph A. Gliem, 2003) Cited a thumb rule by George and Mallery (2003) gives us a rules of thumb as follow: “_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable”

Table 4.3: Reliability Test

Factor name	Item no.	Cronbach’s Alpha
Driver	6	0.711
Vehicle	5	0.788
Trip	5	0.885
Scheduling	7	0.809
Safety	5	0.822
Total	28	0.842

(Source: survey, 2018)

This research used the Cronbach’s Alpha method with the data collected from 67 respondents is done to test the reliability. The test was carried out only for questions prepared in Likert five scale formats to check the internal consistency of those questions or variables used. According to Table No.5 the Cronbach’s alpha value obtained is 0.842. From the rule of Cronbach’s alpha value point of view, this value could be taken as a good value. The value confirmed the internal consistency of the variables used.

4.4 Analysis of the finding

Liquid cargo transportation has an impact on organizational effectiveness. In this regard, prior to measuring elements contributing to better performance of the transporter and consequently the oil company. Perception of outsourcing transport service by Oil Company is measured. The main reason is being that if oil company employees has full knowledge outsourcing reasons, challenge and benefits as per the literature reviewed they will act accordingly to get efficient service from the outsourcing company and in addition fulfil the gap on their part.

In addition transporters were asked about element of transport that affect their performance Results were measured using quantitative questions in which respondents were required to indicate the extent to which they agree or disagree with. In line with that, all items on service quality were presented as per Likert scale by using five points ranging between 1=Strongly Disagree, 2=Disagree, 3 Neutral, 4=Agree and 5=Strongly Agree.

Accordingly, the descriptive analysis of the finding has been done according to the research questions of the study in which fetched from objectives of the study. Consequently, the finding and the analysis has presented below separately for NOC and transporters.

4.4.1 Reasons and Benefits for outsourcing of liquid cargo transportation

Table 4.4: Reasons for Outsourcing Transport Service

Outsourcing of Transport Service	Mean
Outsourcing is better than In-house transport function for good performance	3.00
Cost reduction is a main element of outsourcing	3.56
Customer Satisfaction is a main element of outsourcing	2.95
Reliable performance is achieved through outsourcing of transport service	2.43
Government interest is the main reason for outsourcing	4.26
Average	3.24

(Source: survey, 2018)

As shown in Table 4.4, the respondents agreed with the majority aspects of outsourcing of transport service as the mean scores were in range 4.26 – 2.43. They agreed that outsourcing is better than in-house transport function for good performance ($\bar{x}$ =3.00), Cost Reduction is the main element of outsourcing ($\bar{x}$ =3.56), Customer Satisfaction is a main element of outsourcing. ($\bar{x}$ =2.43), Government interest is the main reason for outsourcing ($\bar{x}$ =4.26). In

qualitative data gathering eighty percent of the participants agreed with the questioner surveyed data where government interest is the main reason for outsourcing transport service. In addition the focus group discussed and come in agreement that cost reduction is achieved through outsourcing at the expense of customer satisfaction and suggested if there is a room to be explored where oil companies operate limited transport service for their critical customers to satisfy the customers and continuation of long term business to business contact. But, the overall mean of 3.24 indicates agreement with reasons for outsourcing of transport service.

Table 4.5: Benefits of Outsourcing

Yes			No	
	Frequency (N=23)	%	Frequency (N=23)	%
Cost Saving	20	89	3	13
Time Saving	13	80	10	43
Risks reduction	14	54	9	39
Accountability	12	52	11	48

(Source: survey, 2018)

The collected data indicated that all of the respondents agreed economic value of outsourcing cargo transportation. However, the respondents listed time saving, cost efficiency, accountability, networking and risks reduction as the main benefits that the company could drive from outsourcing to the logistics provider party. Among the respondents, about 89% (N=20) are listed cost saving as main benefit that the company derives from outsourcing, and the remaining 13% responded that time is not the main benefits that company derives from outsourcing (Table 4.5). A proportion of the respondents' that sense to the benefits of outsourcings of cargo transportation by NOC based on their "yes" or "no" response are indicated (Table 4.5).

Table 4.6: Outsourced Transport Performance Monitoring

Outsourced Transport Performance Monitoring	Mean
Monitoring the performance of the outsourced functions is useful to take full advantage of the benefits of outsourcing	3.13
Performance measurement is taken as an avenue for logistics managers to achieve sustainable competitive advantage	3.48
Tracking/GPS system facilitates Performance Monitoring	3.52
Average	3.38

(Source: survey, 2018)

Table 4.6 shows that the respondents agree with the almost all aspects of monitoring outsourced transport performance as the mean scores were in range 3.52 – 3.13. Accordingly, they agreed that monitoring the performance of the outsourced functions is useful take full advantage of the benefits of outsourcing ($\bar{x}$ =3.13), performance measurement is taken as an avenue for logistics managers to achieve sustainable competitive advantage ($\bar{x}$ =3.48), transporters are rewarded as per their results ($\bar{x}$ =3.52), But, the overall mean of 3.38 indicates agreement with outsourced transport performance monitoring.

In Focus group discussion all agreed that monitoring transport performance is crucial to the company, however the level of understanding how to measure the performance is not similar. Some are monitoring the fuel consumption, others the revenue form the trip and only those organization which are formed as plc. that do not operate with association members vehicles monitor all aspect of transport performance , like fuel, tyre, driver, maintenance cost, trip & scheduling. Moreover all agreed that having tracking/GPS system is crucial gadget for performance monitoring.

Table 4.7: Scheduling/Dispatching in National Oil Ethiopia (NOC)

Scheduling/Dispatching	Mean
Scheduling process is transparent and consider issues related to dispatching	3.26
Scheduling trucks affect outsourced transport Performance	3.47
Tracking GPS System assist dispatching process	2.17
Drivers could affect dispatching process	3.00
Inconsistent customer order affects the dispatching process	3.78
Average	3.14

(Source: survey, 2018)

As Table 4.7 displays, the respondents agreed with most aspects of scheduling/dispatching as the mean scores were in range 3.78 – 2.17. Hence, they agreed that scheduling process is transparent and consider issues related to dispatching ($\bar{x}$ =3.26), Scheduling trucks affect outsourced transport performance ($\bar{x}$ =3.47, drivers could affect dispatching process ($\bar{x}$ =3.00), inconsistent customer order affects the dispatching process ($\bar{x}$ =3.78), On the other hand, the respondents disagreed that and GPS System assisting dispatching process ($\bar{x}$ =2.17). The overall mean of 3.14 indicates nearly agreement with scheduling/dispatching. The focus group discussion showed that transparency of scheduling needs improvement and automation of scheduling with software and investing in trucking with GPS is useful though inconsistent order is a major factor in disrupting planned scheduling.

4.4.2 Determinants of Performance of Liquid cargo transport

To answer the second research question in which determining elements that affect liquid cargo transportation is done as follows.

Table 4.8: Elements that affect liquid cargo transport performance, Driver Management

Driver Management	Mean	Std.D
Recruiting qualified driver has challenged the industry	4.37	.599
Recruiting Ethical driver is challenging the transporter performance	2.72	.670
Skilled Drivers turnover is high in the industry	3.82	1.014
Raising driver benefit to retain skilled drivers is limited	3.15	.839
Driver performance monitoring is important to the transporter performance.	2.81	.783
Clearly defined goals are useful in motivating drivers for good performance	3.18	.548
Average	3.33	-

(Source: survey, 2018)

Table 4.8 shows that the respondents agreed with the all aspects of driver management as the mean scores was 3.33. Accordingly, they agreed that Recruiting qualified driver has challenged the industry ($\bar{x}$ =4.37), Recruiting an ethical driver is challenging the driver management. ($\bar{x}$ =2.82), Skilled Drivers turnover is high in the industry ($\bar{x}$ =3.82), Raising driver benefit to retain skilled driver is limited. ($\bar{x}$ =3.15), Driver performance is monitoring is important to the transporter performance ($\bar{x}$ =2.81), and clearly defined goal are useful in motivating drivers for good performance ($\bar{x}$ =3.18). Hence, an overall mean of 3.57 indicates agreement with driver management. The Focus group discussed in these set of question and

currently drivers who are qualified and experience to drive are limited and transporters take from each other this make it difficult to strictly follow monitoring of the driver because of finding another one takes time and the revenue form the vehicle stops immediately. In addition to these the very low tariff limits the motivation to the driver, which consequently affects trip performance of the vehicle.

Table 4.9: Elements that affect liquid cargo transport performance, Vehicle Management

Vehicle Management	Mean	Sta.D
Old Vehicles are affecting transporters performance	4.07	.703
Availability of spare parts is an obstacle in maximizing vehicle utilization	3.30	.817
Vehicle maintenance cost is affecting transporter performance	3.00	.737
Preventive Maintenance taken as a principle to improve utilization	2.73	.539
Having own garage contributes to good vehicle maintenance	2.24	.364
Average	3.07	-

(Source: survey, 2018)

Table 4.9 shows that the respondents agreed with the almost all aspects of vehicle maintenance as the mean score for all is 3.07. Accordingly, they agreed that Old Vehicles are affecting transporters performance ($\bar{x}$ =4.07) which is high though currently the oil companies are getting new vehicles into the system by giving loan to the transporters. Availability of spare parts is an obstacle in maximizing vehicle utilization. ($\bar{x}$ =3.30) which is the second highest element from the group of questions related to vehicle management, Vehicle maintenance cost is high ($\bar{x}$ =3.00) Transporter believes that having own garage is not that significant which is a requirement to be professional transporter in oil companies handbook and as well they do not give emphasis on preventive maintenance ($\bar{x}$ =2.24). On the other hand, the respondents Vehicle Management is found also to be important factor. The focus group addressed that in the current business of transportation in NOC new trucks injected to the system and since more than half is less than 5 years old the main issue is idle time where vehicle utilization is low because of inconsistent orders.

Table 4.10: Elements that affect liquid cargo transport performance, Journey (Trip) Management

Journey (Trip) Management	Mean	Sta.D
Measure trip performance per month	3.02	.961
Trip target vs. actual performance measured monthly	2.50	.877
Trip target vs. actual performance measured for association member vehicles	2.91	.876
Loading of products is affecting trip performance	3.02	.968
Unloading of products is affecting trip performance	3.67	1.040
Average	3.74	-

(Source: survey, 2018)

Table 4.10 shows that the respondents agreed with the majority aspects of journey (Trip) management as the mean scores were in range 3.67 – 2.502. Therefore, they did not see that measuring performance against the standard set by themselves is not a major factor to improve journey management as it depends mostly on external factors like order. In addition to these most of them collect commission from association members and do not dwell much than the vehicles they own as per focus group participants opinion. The result show factors related to order that is loading and unloading products have a mean of 3.02 and 3.67.

Table 4.11: Elements that affect liquid cargo transport performance, Scheduling

Truck Assignment (Scheduling) by oil Companies	Mean	Sta.D
Number of trucks are assigned fairly by oil companies	3.00	.896
Bad route assignment is compensated with good route assignment whenever possible	2.91	.753
Availability of orders govern the fair assignment of trucks	3.96	.706
Personal opinion of the scheduler governs the fair assignment of trucks.	2.82	.458
Product availability as supply point affects truck assignment	4.22	.735
Automated/Computerized truck assignment addresses the issue of truck assignment problem	4.67	.673
Different rate for various route is a better option for transporter performance	2.55	.558
Average	3.44	-

(Source: survey, 2018)

Table 4.11 shows that the respondents view in regards to truck scheduling is agreement where mostly it is affected by product unavailability and inadequate order generation which affects the performance in scheduling. However the personal opinion of the scheduler is not a major factor in scheduling the truck where the score is 4.22 in addition it can be yet improved if automated computerized software system is implemented ($\bar{x}$ =4.67). An overall mean of

3.44 indicates truck assignment (Scheduling) by oil companies is found to be an important factor.

Table 4.12: Elements that affect liquid cargo transport performance, Safety Management

Safety Management	Mean	Sta.D
Safety management affects the transporter business	3.70	1.000
Drivers often contribute more to the occurrence of accident	3.21	.808
Condition of vehicle inspected before any trip	3.00	.739
Road condition contribute more to occurrence of accident	2.61	.739
Proactively manage safety issue in the organization	2.16	.567
Average	2.94	-

(Source: survey, 2018)

Table 4.12 shows that the respondents disagreed with some aspects of Safety Management as the average mean scores were 2.94. Consequently, they disagreed that Road condition contribute more to occurrence of accident ($\bar{x} = 2.61$), The minimum store is on element which states Proactively manage safety issue in the organization ($\bar{x} = 2.16$) which indicates that they do not practice safety management as it contradicts the highest score which talks about addressing safety issues as system, Safety management affects the transporter business ($\bar{x} = 3.70$).

4.4.3 Relative Important Elements – Performance of Liquid Cargo Transport

From the results of descriptive statistics of factors for determinants of outsourced liquid cargo transportation among transporters is described in below table.

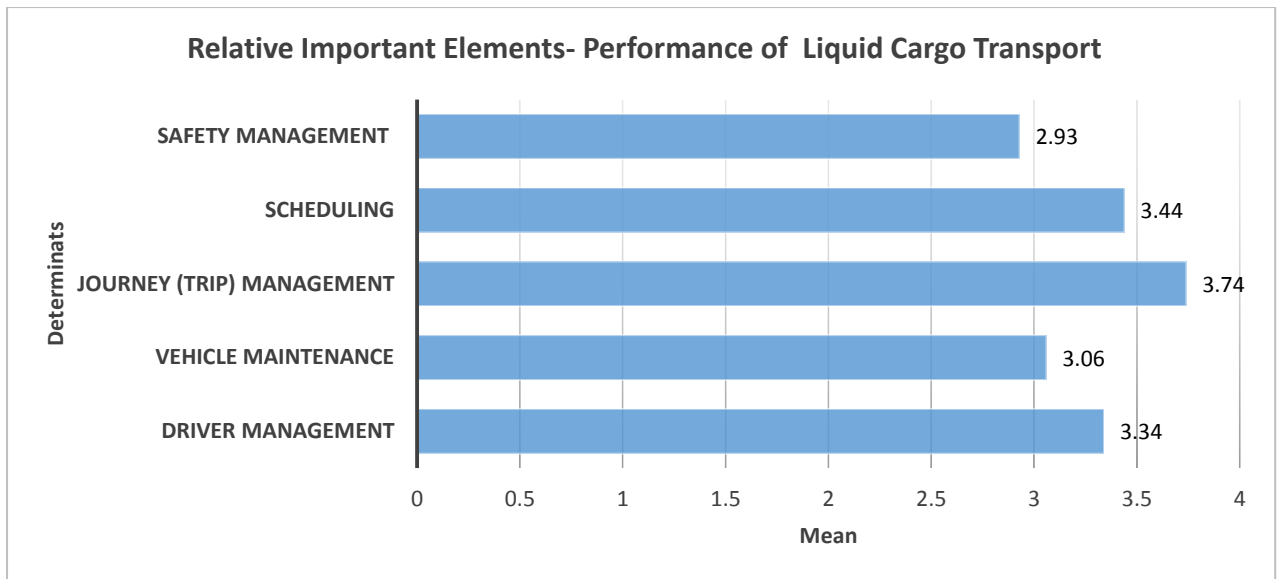


Fig 4.1 – Relative Important Elements- Performance of Liquid Cargo Transport

The above table indicate that Driver Management, vehicles Management and Journey (Trip) Management are the four major elements. However the transporters give less emphasis to Safety management as they are not able to see fully how it is directly and indirectly related to the transporter additional revenue. However the Focus group gave emphasis that proactive management of safety is crucial to the existence of the transport company. This implies that major factors that enhance transporters performance are determined mostly by their own selves transporters.

4.4.4 Relationship between Liquid Cargo transport and Transporters Performance

The second research question is aimed to determine the relationship between determinants of liquid cargo transportation Transporters Profitability. To measure the linear correlation between two variables we have used person correlation. It has a value between +1 and -1, where 1 is total positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation.

Table 4.13: Pearson Correlation between elements of outsourced Liquid cargo transportation and Transporters Profitability

		Transporters Profitability
Driver_ Performance	Pearson Correlation	0.461**
	Sig. (2-tailed)	0.000
Vehicle_ Performance	Pearson Correlation	0.676**
	Sig. (2-tailed)	0.003
Trip_ Performance	Pearson Correlation	0.671**
	Sig. (2-tailed)	0.001
Scheduling_ Performance	Pearson Correlation	0.457**
	Sig. (2-tailed)	0.002
Safety_ Performance	Pearson Correlation	0.443**
	Sig. (2-tailed)	0.001

(Source: survey 2018)

**. Correlation is significant at the 0.01 level (2-tailed)

*, Correlation is significant at the 0.05 level (2-tailed)

Table 4.13 provides the Pearson's correlation coefficient major determinates of liquid cargo transportation and Transporters Profitability which has been identified using the SPSS. The results indicate that major factors namely Driver Management, Journey (Trip) Management, Truck Assignment (Scheduling), Vehicle Maintenance and Safety Management (Accident) have positive and significant association with Transporters Profitability. This implies that all of major factors have impact on organizational performance, Transporters Profitability. Therefore, the second research question dealing with the relationship between liquid cargo transportation and performance is addressed as above.

4.4.5 Logistics performance of the Liquid cargo transporter and Oil Company.

The third research question is dealing with elements that affect the transporter as well as the oil company and identify improvement areas for both parties. The question focus only on the internal factors that both parties can improve and ignores the external elements like, government policy, road infrastructure and so on.

In the section below 4.4.6 it can be seen that the transporters revenue is dwindling which is in contrast to the high investment cost of the vehicle, and ever increasing running cost of spare

parts, fuel, personnel benefit, etc. As per the transporters data using empirical formula a new vehicle partially financed by the bank will not breakeven in ten years. Therefore the challenge of the industry is dip as the selling price is fixed and transporter are allowed only to work with the fixed tariff. The focus group pointed out the issues and are listed as follows:

- Outsourced contractors lack professionalism and the sector is filled with association of truck owners which is difficult to implement any initiative by the oil companies
- Oil companies have to see the transporters as partners and restrict the number of vehicles to be injected into their system and transporters have to work vice versa where they have to abide strictly by the agreed contract.
- The low transport rate is not easy for the government as it affects pump selling price to solve in the near future therefore it is the duty of both parties to work together to improve the performance of the transporter and satisfying the oil companies customers.
- Modernization of the trip monitoring as well as automation of the scheduling system benefits both therefore have to work together to implement as soon as practicable.

4.4.6 Transporter earning

The below table is taken from the actual earning by transporters for 21 months. The average trip per vehicle is decreased in 2018 compared to 2017. One trip is considered to be 927 km i.e. the distance from Djibouti to Addis and all distances are converted into trip using this analogy. The trip decreased from 3.06 to 2.6. The total earning increased by 22.4 % while the distance travelled improvement is not significant. This shows more vehicles with higher capacity entered to the market which is beneficial to NOC but not attractive to transporters. Due to this fact old vehicles divestment is needed so that the transporters benefit from the growth NOC is making as well as the economy growth in the country.

Table 4.14: Transport Earning

Year	2017	2018
Total Earning per month	104,404,760.85	127,796,236.18
Average no of Vehicles	818	997
Averag earning per Vehicle	127,634.18	128,180.78
Average no ot trip per month		
Average Trip Per month	3.06	2.6
Average Total KM driven per month	2503.08	2592.2

Chapter 5: Conclusion & Recommendations

The last chapter of the paper summarizes the whole chapters of the paper. The first part presents the conclusion of the study by summarizing the major findings of the study. The last part forwards some recommendations that are thought to be practical and feasible.

5.1 Conclusion

The very aim of the study is to assess outsourced liquid cargo transporters performance in relation to major factors associated with of National oil Ethiopia (NOC) and outsourced transporters as well. The findings from the study indicate that there are improvement areas in the area of Trip Management, Scheduling, Driver management, Safety management and Vehicles management.

The Focused group discussion pointed out that currently inconsistent and inadequate order generation by oil companies are affecting the transporters significantly due to high number of vehicles injected to the system. However still shortage of vehicles occur even at this time where transporter claim it is in excess, which shows that professionalism in the transport organizations is at very rudimentary level.

International Oil companies has tried to develop transporters to become professional transporters. Shell Oil Ethiopia had implemented seven pillar model which classifies the transporter from high risk, professional. The pillars are Organization Management, Financial Management, Driver Management, Vehicle Management, Journey Management, Safety Management and Customer service. Unfortunately the push was only from one side where the result of these findings show that there is gap in all areas.

Transporters cannot sustain to operate with this performance unless they have other means from side business and their failure is vividly shown from the data collected. These will consequently affect the oil company and disrupt the supply chain and will create shortage of fuel in the county which has a potential to destabilize the country.

As it is shown in the literature as well in the findings of the research that lack of skilled driver in the sector need to be addressed immediately. The cargo the vehicles carry is dangerous to the environment and to the community unless it is moving with qualified driver. The need for qualified skilled drivers is high as it needs drivers who have well experience in dry cargo to

be upgraded to drive liquid cargo transport. Shortage of qualified skilled drivers affected utilization of vehicles in addition to lack of orders at loading point.

The vehicle management element as of now did not suffer from maintenance and high cost of spare parts the reason being now the vehicles are relatively low and the truck un utilization is caused mainly by un availability of orders at supply point which is National oil Ethiopia (NOC, product un availability by supplier which is the Ethiopian petroleum supply enterprise and lack of skilled drivers. These factors need the effort of the transporter, oil Company and government.

The trip performance is also affected by number of factors. Trip monitoring is essential for the driver efficiency and for instituting and implementation of driver incentive. On board computer fitted with GPS system will help to close gaps from the transporter side by monitoring the driver and the vehicle proactively. From the oil company side a lot of effort has to be done to streamline order from the service stations and commercial customers. If the orders become more or less regular the transporter cost will be reduced and will send its vehicle to the port only when orders are available thus reducing standing cost at supply point. In addition to these trucks are stranded at discharging point for number of reasons and documentation error from the supply point can be addressed immediately.

Scheduling of trucks by oil companies is no more an important issue that affects severely the transporters currently. However transporters have suffered due to unfair and not transparent scheduling process by oil company's dispatchers. The only solution which is not yet implemented is automation of scheduling process. It will address the issue of scheduling and increase the trucks trip turnaround time.

Transporters have given low rating for safety management in the research. They believe it is important but do not invest the required resource to achieve it. They do focus only on the reactive part of safety management. The underlying cost of direct and indirect issues are huge which need to be addressed by professionals.

5.2 Recommendation

Based on gaps identified in the study, the following recommendations are forwarded so as to bring the desired result regarding liquid cargo transport performance.

- Performance Monitoring of the outsourced transporter has to be critically seen and tools to monitor need to be availed by NOC. Regular engagement is also useful to address issues proactively
- There is a gap related to employing computerized scheduling/dispatching. Therefore, it is better to employ automated based service provision to make it reliable updated.
- Customer service of NOC should strive better to streamline the flow of orders from customers to be regular.
- GPS system need to be fitted to all vehicles and for non-compliant vehicles exit strategy need to be prepared.
- There is a business case for transporters to be professional transporter. The current way of transportation by associations need to be addressed. Transporters should realize the benefits of being a professional company. In this regard the oil company should assist and show the way as the international companies used to do as it benefits both parties.
- Oil companies have to see the transporters as partners and restrict the number of vehicles to be injected into their system and transporters have to work vice versa where they have to abide strictly by the agreed contract.
- The low transport rate is not easy for the government as it affects pump selling price to solve in the near future therefore it is the duty of both parties to work together to improve the performance of the transporter and satisfying the oil companies customers.
- Safety Management should not be seen lightly, the business case for safety has to be understood well.
- Government should not overlook the transport problem of low transport rate, fixed rate for all type of terrain, reviewing of rates regularly.
- Government, Oil companies, Liquid cargo transporters should work together before the real problem affects the supply chain of fuel in the country.

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Annex 1: Questionnaire

Questionnaire for the purpose of Research on Impact of Liquid Cargo Transportation on Performance

Consent Statement

Dear Respondent,

Please fill the questionnaire given below fairly enough so that it can really help in Research on Impact of Liquid Cargo Transportation on Performance. You are kindly requested to express your free and frank opinion with regard to the worthiness of each statement. It would be very kind of you to spare your precious time for the same. Please try to answer all the questions in the survey. I assure you that the responses will be used only in aggregate, wholly and solely for the purpose of academic research and will be kept strictly confidential:-In line with this:

- Your participation in this study is voluntary; you will not be paid for your participation. You may withdraw from the study at any time without penalty or harm of any type. If you decline to participate in or choose to not complete the questionnaire, the researcher will not inform anyone of your decision, and no foreseeable negative consequences will result.
- The researcher will not identify you by name in any report using information obtained from your questionnaire; your confidentiality as a participant in this study will remain secure. Subsequent uses of data generated by this questionnaire will protect the anonymity of all individuals.

Questionnaires A – NOC Employees

Part I - Oil Company Profile						
I. Educational level _____						
II. Age _____						
III. Gender _____						
IV. Years of Service _____						
Part II - Questioner related to Transport, Outsourcing, Performance monitoring and Scheduling/Dispatching						
Where: 1=Strongly Disagree, 2=Disagree, 3 Neutral, 4=Agree and 5=Strongly Agree						
NO.	Description	1	2	3	4	5
Outsourcing of Transport Service						
OT 1	Outsourcing is better than In-house transport function for good performance	1	2	3	4	5
OT 3	Cost reduction is a main element of outsourcing	1	2	3	4	5
OT 4	Customer Satisfaction is a main element of outsourcing	1	2	3	4	5
Outsourced Transport Performance Monitoring						
OTP 1	Monitoring the performance of the outsourced functions is useful to take full advantage of the benefits of outsourcing	1	2	3	4	5
OTP 2	Performance measurement is taken as an avenue for logistics managers to achieve sustainable competitive advantage	1	2	3	4	5
OTP 3	Tracking/GPS system facilitates performance monitoring	1	2	3	4	5
Scheduling/Dispatching						
SD 1	Scheduling process is transparent and consider issues related to dispatching	1	2	3	4	5
SD 2	Scheduling trucks affect outsourced transport performance	1	2	3	4	5
SD 3	Tracking/GPS system assisting dispatching process	1	2	3	4	5
SD 4	Drivers could affect dispatching process	1	2	3	4	5
SD 5	Inconsistent customer order affects the dispatching process	1	2	3	4	5
Benefits of Outsourcing Where: 1=No , 2=Yes						
1	Cost saving is one of the benefits of outsourcing transport service	1			2	
2	Time saving is one of the benefits of outsourcing transport service	1			2	
3	Risk reduction is one of the benefits of outsourcing transport service	1			2	
4	Accountability is one of the benefits of outsourcing transport service	1			2	

Questionnaires B- Liquid cargo transporters

Part I - Transport Company Profile						
I. Company Name (Optional) _____						
II. Educational level _____						
III. Age _____						
IV. Gender _____						
V. Years of Service in the business _____						
Part II - Questioner related to transporters performance						
Where: 1=Strongly Disagree, 2=Disagree, 3 Neutral, 4=Agree and 5=Strongly Agree						
NO.	Description	1	2	3	4	5
Driver Management						
DM1	Recruiting qualified driver has challenged the industry	1	2	3	4	5
DM2	Recruiting Ethical driver is challenging the transporter performance	1	2	3	4	5
DM3	Skilled Drivers turnover is high in the industry	1	2	3	4	5
DM4	Raising driver benefit to retain skilled drivers is limited	1	2	3	4	5
DM5	Driver performance monitoring is important to the transporter performance.	1	2	3	4	5
DM6	Clearly defined goals are useful in motivating drivers for good performance	1	2	3	4	5
Vehicle Maintenance						
VM1	Old Vehicles are affecting transporters performance	1	2	3	4	5
VM2	Availability of spare parts is an obstacle in maximizing vehicle utilization	1	2	3	4	5
VM3	Vehicle maintenance cost is affecting transporter performance	1	2	3	4	5
VM4	Preventive Maintenance taken as a principle to improve utilization	1	2	3	4	5
VM5	Having own garage contributes to good vehicle maintenance	1	2	3	4	5
Journey (Trip) Management						
JM1	Measure trip performance per month	1	2	3	4	5
JM2	Trip target vs. actual performance measured for own vehicles	1	2	3	4	5
JM3	Trip target vs. actual performance measured for association member vehicles	1	2	3	4	5
JM4	Loading of products is affecting trip performance	1	2	3	4	5
JM5	Unloading of products is affecting trip performance	1	2	3	4	5
Scheduling by oil Companies						
TA1	Number of trucks are assigned fairly by oil companies	1	2	3	4	5

TA2	Bad route assignment is compensated with good route assignment whenever possible	1	2	3	4	5
TA3	Availability of orders govern the fair assignment of trucks	1	2	3	4	5
TA4	Personal opinion of the scheduler governs the fair assignment of trucks.	1	2	3	4	5
TA5	Product availability as supply point affects truck assignment	1	2	3	4	5
TA6	Automated/Computerized truck assignment addresses the issue of truck assignment problem	1	2	3	4	5
TA7	Different rate for various route is a better option for transporter performance	1	2	3	4	5
<u>Safety Management (Accident)</u>						
SM1	Safety management affects the transporter business	1	2	3	4	5
SM2	Drivers often contribute more to the occurrence of accident	1	2	3	4	5
SM3	Condition of vehicle inspected before any trip	1	2	3	4	5
SM4	Road condition contribute more to occurrence of accident	1	2	3	4	5
SM5	Proactively manage safety issue in the organization	1	2	3	4	5
Impacts on Performance						
PM1	Driver Management affects transporter performance	1	2	3	4	5
PM2	Vehicle management affects transporter performance	1	2	3	4	5
PM2	Trip management affects transporter performance	1	2	3	4	5
PM3	Scheduling affects transporter performance	1	2	3	4	5
PM2	Safety management affects transporter performance	1	2	3	4	5

Annex 2: Focus group questions Guide

1. What are the advantage of outsourcing transport service to the National Oil Ethiopia?
2. What are the challenges related to outsourcing of transport service?
3. What is the current level of transporters performance?
4. How do you perceive working with NOC?
5. What are the most important elements to improve transporters performance given the current situation on the ground?
6. What are the most important elements to improve customer satisfaction?
7. Is there any correlation between your performance and working with NOC? How?
8. How do you explain the major benefits and shortcomings while working with NOC?
9. What are the improvement areas where transporters and NOC work to improve the current situation?