Cross-border Dry Cargo Transport Operation Performance in Ethiopia

Yibeltal Dubale Tazzie, Dr. Belew Dagnew Bogale

Abstract— This research aimed to assess the organizational structure of cross border dry cargo transport operators and their operation performance in Ethiopia. In order to achieve the intended objective of the study, this research employed mixed research approach and cross-sectional survey research strategy. For this study, 319 samples were taken using systematic sampling and key informants were also taken for interview through judgmental sampling. The sources of data were both primary and secondary collected through questionnaires, interviews and document review. For data analysis both descriptive and inferential statistics were employed. The findings of the study shows that cross border dry cargo transport operators in Ethiopia are organized in three forms: Association, Company and Private Owners. Associations are the largest in number with highly fragmented and loosely organized structure and have low level of operation performance than others. Most of the transport operator, particularly Associations have no operation performance target and proper operation performance measurement and recording systems using key performance indicators. The overall operation performance of the operators is low to medium. The analysis of variance (ANOVA) shows that, there is a significant difference among operators on their level of operation performance for the three groups with Sig. value (p=0.000<0.05). The post-hoc test indicates that Associations operation performance is significantly different from Companies and Private Owners with Sig value (p=0.000>0.05). On the other hand, the level of operation performance of Companies is not significantly different from Private Owners with Sig value (p=0.950>0.05). Thus, to improve the operation performance of transport operators, the government should give due attention to the organizational structure of cross border dry cargo transport operators.

Index Terms— Cross-border, Dry Cargo, Operation Performance, Organizational Structure, Transport Operators

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1. INTRODUCTION

1.1.Background of the Study

In today's economy, the road transport industry is an essential element of modern supply chains. It connects production, distribution and consumption due to the flexibility and capability to provide door-to-door services. Road transport is the dominant mode of transport in many countries of the world, and plays an especially important role in emerging and developing countries that lack alternative inland transport means such as railways or inland waterways [1].

Road freight transport is the most dominant mode of transport for overland movement throughout the world, which carries on average, more than 80% of the inland freight volume [2]. Road freight transport is one of the most dynamic sectors of the economy, which lies at the heart of the trade facilitation. As the mode of transport that brings most goods to their final destination, it is indispensable to tourism, trade, and the well-being of any economy, and is a primary indicator of economic growth generating a significant portion of GDP, employing millions of people, and offering the primary means for moving domestic and international cargo [3].

Trucking companies had been competing with each other not

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only for traffic, but also with operators of other modes [4]. However, inefficiency in the road freight transport resulted in higher transport cost, which in turn led to the prices to be inflated and the business competitiveness to be impaired [5].

Most African landlocked countries have a distance of 1000 km from seaport to a capital city that results high transport prices for delivery from port to capital city range from 15 to 20% of import costs, which is 3-4 times greater than in most developed countries. Consequently, most African countries had low productivity of the trucking industry and low capacity use with high proportion of trucks running empty back to port [6]. Therefore, any improvement of road transport services could have immediate significant impacts on all other economic and social sectors by strengthening employment, living conditions, and social welfare.

In Ethiopia, the trucking industry is the most dominant freight transport system which handles over 90% of national and 97% of import-export freight. However, it had been affected by high costs of transport due to inefficiency of transporters and other stakeholders involved in the transport sector [7].

Ethiopia being one of the developing countries needs to be integrated with the global economy that can only be possible through efficient and effective flows of goods to and from the country in international trade. To this end, the country needs to assess the operation performance of transport operators.

1.2.Statement of the Problem

The road freight transport in Ethiopia now becomes a bottleneck in the economic development and social well-being of the

society. The sector is poorly developed and remains an obstacle to the competitiveness of export in the international market, fast delivery of import goods to productive use; and generally to the realization of economic development of the country [7]. This is due to the underperformance of the road freight transport sector in the country.

The trucking companies in South Africa were able to utilize their trucks at levels similar to European transporters 10,000 to 12,000 kilometers per month and up to 240,000 km per year [8]. Zambia; a landlocked country in Africa has typical distance target for road transport operator is 130,000 km per annum per truck [9]. Furthermore, the road transport industry in Kenya is large and well equipped with average distance coverage between 120,000-150,000 km/truck/year in most efficient trade corridors [10].

However, the average annual distance covered per truck in Ethiopia was not more than about 60,000 km [11]. It was also stated that now a days the annual distance covered by best performing truck was not more than 90,000 km per year [12]. This indicates how much the operation performance of dry cargo road transport is poor compared to other countries.

In spite of its fundamental importance to the economy, there is lack of academic studies related to road freight transport. Issues related to operation performance of the trucking industry are still untouched. Therefore, considering its crucial importance and its influence on the economic development of the country, this research tries to assess the organizational structures of commercial cross-border dry cargo road transport and its effects on operation performance.

1.3. Research Objectives

The research objectives for this study include:

1) To examine the organizational structure of cross-border dry cargo road transport operators in Ethiopia;
2) To assess the operation performance status of cross border dry cargo transport operators in Ethiopia;
3) To campare operation performance status among different organizational structure;

1.4. Significance of the Study

This research will have great contribution in exploring the organizational structure of cross border dry cargo road transport and their level operation performance in Ethiopia. In addition, it will help to analyse variations in the operation performance of transport operators that would be a good addition in literature. The recommendations for future research are also anticipated to improve the operation performance of the trucking industry.

2. LITERATURE REVIEW

This section present review of literature related to the research.

2.1. Road Freight Transport Operation

Transportation can be defined as the act of moving goods or people from an origin to a destination that plays a key role in the supply chain. Freight transport is the physical process of transporting various commodities or goods using different modes [13].

Road freight transport is more flexible and versatile than other modes of transport because of vast networks of roads. It can offer point-to-point service between almost any origin and destination. Its flexibility and versatility enabled the road freight transport to become dominant in many countries of the world [14].

2.2. Operation Performance Indicators

Performance measurement in the freight transport industry has attracted two realms of interest: that of the public sector and the providers. The public sector is keenly interested in measures that justify policy decisions, such as asset productivity, total shipments, total flow, how well regulations and standards are being met. On the other hand, the providers have an interest in economic measures, such as aspects of financial performance, along with equipment, load, haul, employee, and customer service measures. Despite the lack of uniformity and consensus in different modes, six measures seem to be represented in all five of the freight transport modes: average length of haul, operating ratio, revenue per ton-mile or kilometer, tonnage uplifted, ton-miles or kilometer and dwell time or empty miles factor [15].

Freight Best Practice identified five Key Performance Indicators (KPIs) to measure vehicle operating efficiency: vehicle-fill, empty running, and time utilization, deviations from the schedule and fuel efficiency. V**ehicle fill** can be measured by weight, volume and deck length. On the other hand, **empty running** indicates the marketing strategy and level of networking and cooperation within the regime. **Time utilization** indicates what a vehicle is doing at any one time. **Deviation from schedule** indicates delays and lost time that can result for a number of reasons such as: lack of drivers, delays in loading at the depot, delays at the collection point, traffic congestion, vehicle breakdown, and route dislocation. **Fuel efficiency** is a useful measure in terms of liters per kilometers per vehicle [16].

2.3. Type of Freight Transport Organization

Freight carrier and a service provider are usually paid for the services provided. Accordingly there are two types of freight transport organizations as follows [17].

1) **Assistive auxiliary providers:** Private companies are licensed to transport their own products or input and are widely used in most countries. It is also possible to provide commercial freight services as necessary.

2) **Freight forwarders or hire-and-reward operators**: Individual freight transport operators include transit

owners, landlords, drivers, or freight forwarders. This type of organization is widely available in the world: Africa, North and South America, and Europe.
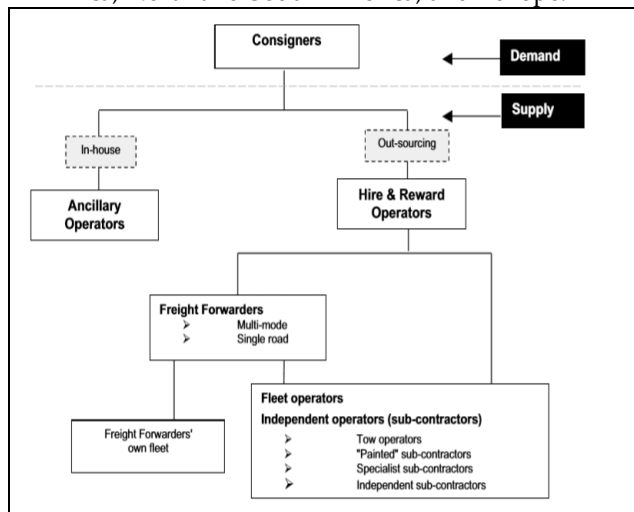

Fig. 1: Type of Freight Transport Organization
Source: World Bank (2009)

2.4. Global Practice

Road transport is the most dominant modes of freight transport in many countries of the world, particularly of the low and middle-income countries. The structure of the road freight transport industry is highly complex and fragmented. The performance of international road transport services has been also hampered by cumbersome regulatory environment, lack of intermodal services, and lack of adequate interface, fragment road inspections and cumbersome customs procedures that result an excessive long transit time. Especially, the landlocked countries pay additional transit charges amounting to about 20 % of the value of goods transported, making many commodities less competitive in the world market [8]. In many of the low and middle-income countries, operators' operation performance is very low.

2.5. Road Freight Transport Operation in Africa

Road transport is the most expensive of all motorized modes of transport in Africa. It is adaptable to nearly all kinds of movement of people and goods. In Africa, it accounts for over 80% of all freight and passenger movements. Road transport services in Africa was broadly characterized by high cost and low quality service due to a substantial backlog of road maintenance, rehabilitation and weak institution and an inadequate network [18].

Transit times in most African countries transport corridors are long due to unclear and sometimes conflicting rules and regulations, inefficient service providers, roadblocks, as well as cumbersome administrative and customs procedures. These have created a serious challenge to transport facilitation and trade on the continent. It leads to excessive traffic delays, resulting in a substantial increase in transport costs [19].

3. RESEARCH METHODOLOGY

3.1. Research Design

For this study, both quantitative and qualitative research approaches were used. The qualitative approach helps to construct theoretical description of the study while the quantitative approach was used to describe the numerical aspects. By linking qualitative and quantitative research approach, the advantages of both can be gained. The research types used was descriptive and cross-sectional survey. Descriptive and cross-sectional survey design were used to analyze the existing operation performance of transport operators and to show variation in operation performance among transport operators through data collected from large sample at a point in time.

3.2. Sampling Technique and Sample Size

For this research, both probability and non-probability sampling techniques were used. Regarding to probability sampling, first three natural stratums were formed (association, company and private owners). Then 30 operators were selected from each stratum proportionally. Finally, sample respondents were taken from each selected operators using systematic random sampling technique. On the other hand, purposive sampling was used to select key informants from regulatory bodies, major customers, and trucking companies' managers to get detail information on the issue to be studied.

In order to determine the sample size for this study, the researcher used sample size determination formula [20].

For Known Population:
Sample size (n) = $[Z^2.p.q.N]/[(e^2 (N-1) +(Z^2. p. q)]$

Where:
N= Population size (estimated number of employees=1900)
n= Sample size
Z = Standard normal variable (95% confidence level, 1.96)
p = Estimated characteristics of the target population
q= 1- p
e= Level of statistical significance at 5% margin of errors.
Thus, assuming that the proportion of employee is 0.5, the Z – statistics is 1.96 and the desired accuracy at 0.05 levels, then the sample size of the population would be:
Sample size (n) = $[Z2.p. q. N]/ [(e2 (N-1)) + (z2.p.q)]$
   = $[1.962*0.5*0.5*1900]/ [(0.052(1900-1)) + (1.962*0.5*0.5)]$
      = 1,824.76/ 5.7079= **319**

Therefore, the total sample sizes for this research were 319 employees of transport operators.

4. RESULT AND DISCUSSION

This part of the research presents results by applying statistical analysis to achieve the results. In total, 319 filled questionnaires were subjected to the final analysis.

4.1. Demographic Characteristics of the Respondents

As indicated in Table 1 below, out of 319 sampled respondents,

53% were males and 47% were females. This indicated that the sex composition in the transport organizations were almost proportional. Regarding to age category, 69.3% were above 31 years old who are matured.

Regarding to educational status, 49.8% of the respondents were qualified with diplomas, 37.0% were degree and above. This indicated most of the respondents had diploma and degree. Regarding work experience in the transport sector, 46.7%, had 3-5 years in the sector. This indicated that the operators' employees were less experienced in the transport sector that could affect the operation performance of the operators.

Regarding the type of organization they works, 70.2% were from associations, 23.8% were from companies and the remaining 6.0% were from private owners that were proportional to the number of cross-border dry cargo transport organizations in the country.

Table 1: Demographic Characteristics of the Respondents

No.	Item	Category	Frequency	%
1.	Sex	Male	169	53.0
		Female	150	47.0
2.	Age	18-30 Years	54	16.9
		31-40 Years	119	37.3
		41-50 Years	102	32.0
		51-60 Years	38	11.9
		Above 61 Years	6	1.9
3.	Level of Education	Grade 10 Completed	10	3.1
		Certificate	32	10.0
		Diploma	159	49.8
		Degree & Above	118	37.0
4.	Work Experience in the transport sector	0-2 year	29	9.1
		3-5 year	135	42.3
		6-8 year	89	27.9
		Above 9 year	66	20.7
5.	Type of Operators	Association	224	70.2
		Company	76	23.8
		Private Owner	19	6.0

Source: Field Survey (2019)

4.2. Cross-border Dry Cargo Road Transport Operators in Ethiopia

Cross border dry cargo road transport operators were organized in three legal forms, namely: Association, Company and Private Owners with four different levels each having unique grades A or B except for level 4 [21]. They are organized based on trucks loading capacity, number of trucks and trucks age. The difference between Grades "A" & "B" is only by truck load capacity, where "A" is 30-40 MT and "B" is 20-30 MT.

Accordingly, Level-1 A & B operators should have vehicle age 0-10 years old and minimum of 125 trucks, head office at the center and at least 3 branch offices at different places within

and outside the country. Level 2 A & B operators should have a minimum of 100 trucks with age of 10.1-20 years, head office at the center, and at least 2 branch offices at different places within and outside the country. Level 3 operators should have minimum of 75 trucks with service year above 20 years and should have head offices and at least one branch office. On the other hand, level 4 is allowed only for companies and private owners that have at least 50 trucks with truck age of years as far as it is active to work and payload capacity from 20-40 MT. There is also a special category used to transporting fruits, machines, construction materials, or very large cargos (See fig. 2 below).
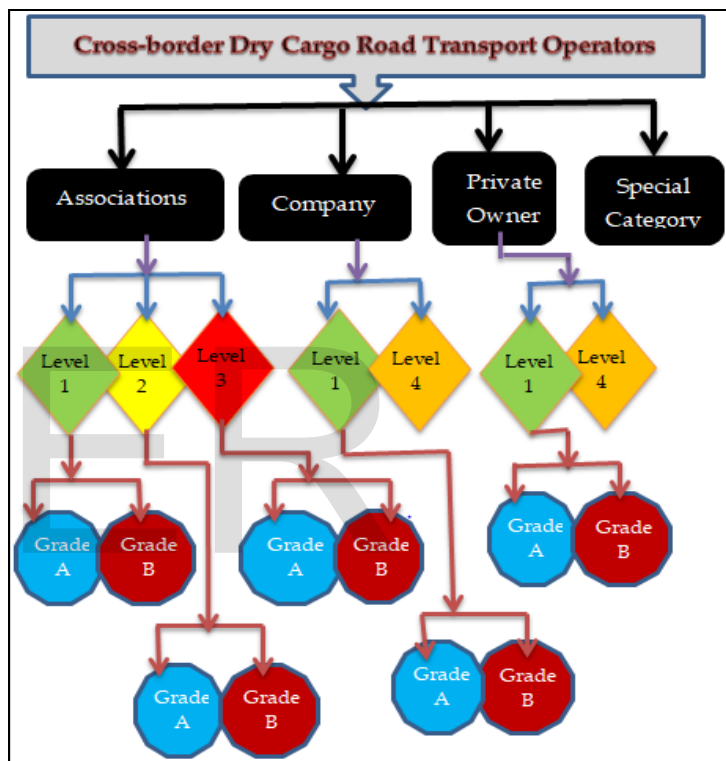

Fig. 2: Organizational Structure of Cross-border Dry Cargo Transport Operators
Source: FTA (2013)

Table 2 below revealed that, there are 102 cross border dry cargo road transport operators in the country with total number of 13,528 vehicles. From this, 69 are Associations having a total of 10, 516 vehicles and 27 are Companies with total number of 2,767 vehicles and the rest 6 are Private Transport Owners with 346 vehicles.

Table 2: Cross-border Dry Cargo Transport Operators

Structure	No. of Operators	Truck Payload Capacity in MT				Total
		20-29.9	30-34.9	35.0-37.9	Above 38.0	
Association						
Level 1-A	25	130	84	1258	4316	5788
Level 1-B	1	67			0	67
Level 2-A	12	51	232	308	967	1558

Level 2-B	10	286	786	93	284	1449
Level 3-A	7	58	241	106	169	574
Level 3-B	14	528	517	19	16	1080
Total	69	1,120	1,860	1,784	5,752	10,516
Company						
Level 1	12	51	9	71	2091	2222
Level 4	15	75	30	94	245	545
Total	27	126	39	165	2336	2767
Private Owners						
Level 4	6	-	-	-	346	346
Grand Total	102	1,246	1,899	1,949	8,434	13,528

Source: FTA (2019), Compiled by the Researcher

Fig. 3 below also shows the proportion of dry cargo road transport operators in the country. Accordingly 67.6% of the cross-border dry cargo transport operators are Associations, 26.5% and 5.9% are Companies and Private Owners respectively. This shows that the largest share of transport operators in Ethiopia is Association followed by companies.
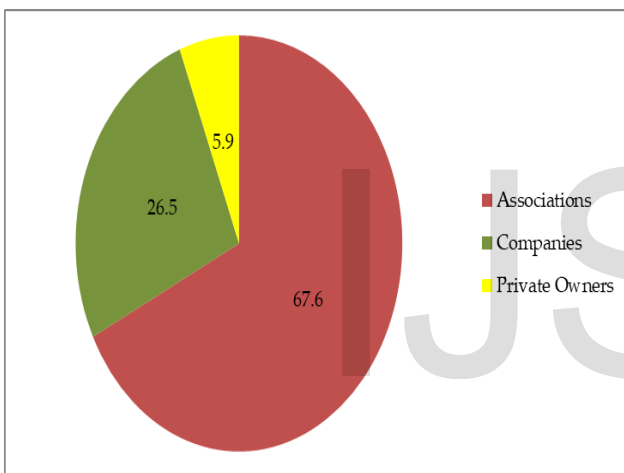

Fig. 3: Proportion of Transport Operators by Type
Source: FTA (2019), Computed by the Researcher

The interview result also shows that Associations are highly fragmented and loosely organized that leads for difficulties in managing their operation. This in turn leads for low level of operation performance as discussed below in other sections.

Fig.4 below shows the proportion of cross-border dry cargo transport operators by their level. Accordingly, only 26 (25.5%) of Associations and 12 (11.8%) of Companies were within level 1 category and the rest 64 (62.7%) were other than level 1 category. This implies that the largest share of cross-border dry cargo transport operators were below level 1 category. This implies that many of the cross-border dry cargo road transport operators were with limited number and old aged trucks.
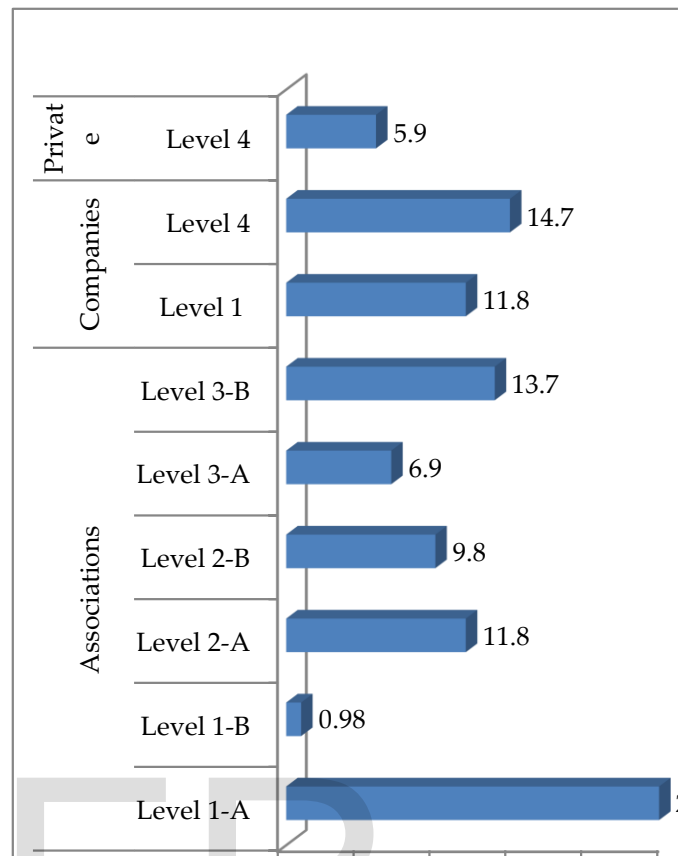

Fig. 4: Proportion of Transport Operators by Level
Source: FTA (2019), Computed by the Researcher

Table 3 and Fig. 5 below indicated that the largest share (77.7%) of cross-border dry cargo truck is from Association. This implies from the three types of cross-border dry cargo road transport operators associations are largest both in their-number and trucks within them.

Table 3: Trucks by Type of Transport Operators

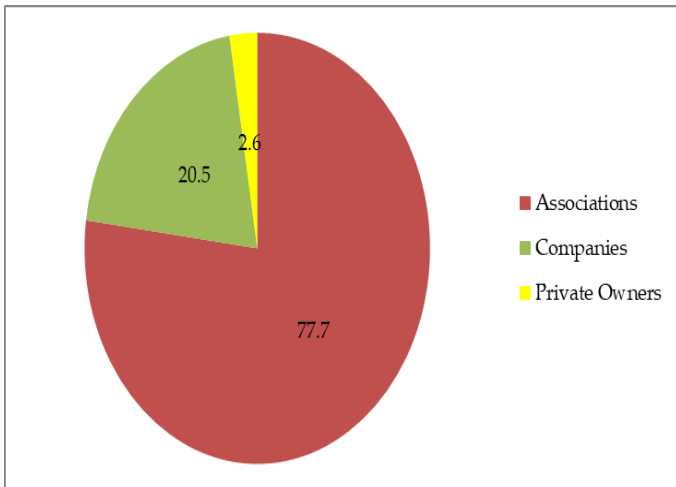| Organizational Structure	Total Number of Vehicle	%
Associations	10,516	77.7
Companies	2767	20.5
Private Owners	346	2.6
Grand Total	13,528	100

Source: FTA (2019), Computed by the Researcher

Fig.5: Proportion of Trucks by Type of Operators
Source: FTA (2019), Computed by the Researcher

Table 4 and Fig. 6 below showed that the proportion of cross-border dry cargo trucks by their age category. Accordingly, the largest shares (65.5%) were under age category of 0-10 years. But, still many of the trucks (64.5%) found above age of 10 years service. With increasing truck age the operation cost will increase and the operation performance become declined. This could affect the operation performance of cross-border dry cargo transport operators in the country.

Table 4: Cross border Dry Cargo Trucks by Age

Truck Age	Number of Vehicles	%
0-10 year	8,867	65.5
10.1-20 year	3,007	22.3
Above 20 year	1,654	12.2
Total	13,528	100

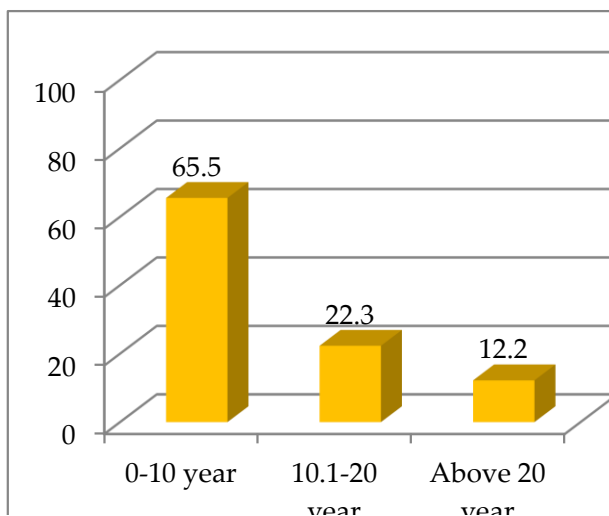*Source: FTA (2019), Computed by the Researcher*

Fig. 6: Proportion of Trucks by Age
Source: FTA (2019), Computed by the Researcher

4.3. Transport Operation Performance of Operators

4.3.1. Presence Operation Performance Target

Based on Table 5 below, 71.5% of the respondents responded that operators have no clearly designed transport operation target and the remaining 28.5% responded that they have operation target.

When we compare among operators, 79.9% of the respondents of transport Associations said that there is no operation target established to achieve. On the other hand, 51.3% and 36.8% of respondents of companies and private owners said that there is operation. From this we can understand that companies are relatively better than Associations and Private owners are relatively better than associations in establishing operation target.

Table 5: Response on Presence of Operation Target

Does your organization has operation target?		Type of Transport Operators			Total
		Association	Company	Private Owner	
Yes	Count	45	39	7	91
	%	20.1	51.3	36.8	28.5
No	Count	179	37	12	228
	%	79.9	48.7	63.2	71.5
Total	Count	224	76	19	319
	%	70.2	23.8	6.0	100.0

Source: Field Survey (2019)

Interview also shows that most of the operators simply consider short-term profit gained from the business rather than thinking strategically to continue in the sector. Particularly, Associations run their operation traditionally without planned targets to be achieved. This was due to the organizational structure and the traditional practice that do not allow them to enforce and control members of the associations.

4.3.2. Operation Performance Measures based on KPI

Operation performance measurement based on key performance indicator (KPI) is vital for operators in order to achieve the stated goals and targets. The finding of the study presented in Fig.7 below indicates that 94.7%, 87.1%, 75.6%, 74.6%, 74.0 %, 72.4%, 67.7% and 59.6% of the respondents said that operators did not measure and record daily serviceability factors, vehicle utilization rate, garage status, revenue/vehicle, load factor, operation cost/truck/km, freight uplifted and vehicle distance coverage respectively. This implies that most of the operators did not properly measure and record operation performance.
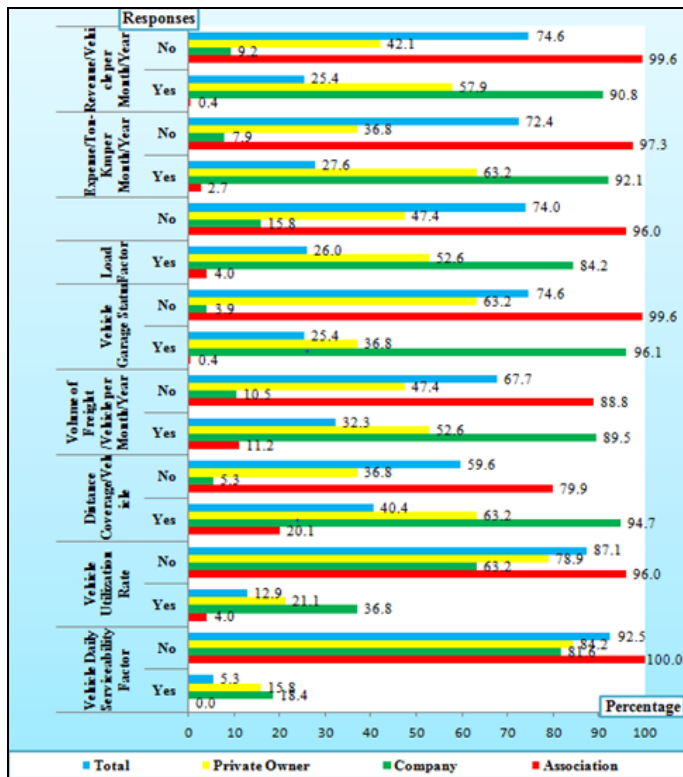
Fig. 7: Response on Operation Performance Measure using KPI
Source: Field Survey (2019)

When we compare the difference among cross-border dry cargo road transport operators, in all of the above key performance indicators transport companies are relatively better than associations and private owners as well.

The interview also show that in most cases the trucks were under complete responsibility of the driver and some of the owners as well as associations did not have any information about the daily or weekly status of the truck. Thus, the operation performance measurement, recording and data organization by the operators needs to be given greater emphasis for the success of operators in particular and the country economic development in general.

4.3.3. Operation Performance Status of Operators

Only few transport operators record their operation performance data in Ethiopia. Even at national level there is no well-organized data related to transport operators' operation performance. Table 6 below shows sample relatively better transport operators' from the three groups (Association, Company and Private Owner) operation performance in comparison with the national plan. The Table shows that even though the selected operators were relatively best transport operators, they operate far less than the national plan. It was indicated that there is a big difference in annual distance coverage, round trip frequency and load factor compared to the national plan. This indicated that how poor is the operation performance of the transport operators.

Table 6: Sample Transport Operator Operation Performance

KPI	National Plan	Operators	Operation Performance in 2019	
			Actual Performance	Performance in (%)
Km covered per vehicle	120,000 Km	Company X	64,074km	53.4
		Private Owner Y	60,982km	50.8
		Association Z	52,900km	44.1
Round trip (Addis Ababa-Djibouti port)	5.6	Company X	3.1	55.4
		Private Owner Y	2.8	50.0
		Association C	2.5	44.6
Load factor	100%	Company A	63	63
		Private Owner Y	59	59
		Association C	53	53

Source: Transport Operators Data Compiled by the Researcher (2019)

Table 7 below also revealed that 47.6%, 44.8% of the respondents said that the operation performance of the operator is medium and low respectively. This indicates that the operation performance of the operators was low to medium. Based on the response, there was also a large difference in operation performance among the operators. Accordingly, the operation performance of the associations was low compared to the companies and private owners' performance, where 58.9% and 36.6% of respondents of the associations responded low and medium respectively. On the other hand, 76.3% and 63.2% of the respondents of companies and private owners responded that the operation performance is medium respectively.

Table 7: Respondents View of Level of Operation Performance

Response on Level of Operation Performance		Respondents by Type of Transport Operators			Total
		Association	Company	Private Owner	
Very Low	Count	11a	0a	1a	12
	%	4.9	0.0	5.3	3.8
Low	Count	125a	13b	5b	143
	%	55.8	17.1	26.3	44.8
Medium	Count	82a	49b	8a, b	139
	%	36.6	64.5	42.1	43.6
High	Count	6a	11b	3b	20
	%	2.7	14.5	15.8	6.3
Very High	Count	0a	3b	2b	5
	%	0.0	3.9	10.5	1.6
Total	Count	224	76	19	319
	%	70.2	23.8	6.0	100.0
Each subscript letter denotes a subset of Respondents by Type of Transport Operator whose column proportions do not differ significantly from each other at the .05 level.					

Source: Field Survey (2019)

The interview also shows that operation performance of the operators is very poor, especially of the associations mainly

due to poor operation management system with unskilled human power and loose organizational structure that bind membership.

Similarly, in many developing countries including Ethiopia, small private transport operators dominate trucking industry [22]. It was also indicated that many of the transport operators in Ethiopia were unable to operate efficiently to achieve their own operation target as they were not modernize their fleet that became an obstacle to the safety of services and efficiency of the economy [23].

4.3.4. Variation of Operation Performance Among Operators

The analysis is based on Likert Scale to show the level of operation performance with value (1=Very low, 2=Low, 3=Medium, 4=High and 5=Very high). Thus, the descriptive statistics above revealed that N=319, Mean for Associations, Companies and Private Owners equal to (2.37, 3.05 and 3.00) implies that Companies have high mean score in operation performance followed by Associations. Thus, the maximum value is 5 and minimum is 1. Accordingly, Companies and Private owners have maximum record of 5 (Very high) and associoation have maximum of 4 (High). On the other hand, Companies have minimum of 2 (low); associations and private owners have 1 (Very low) record.

Table 8: Descriptive Statistics

Descriptive								
Level of Operation Performance								
	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Association	224	2.37	.622	.042	2.29	2.45	1	4
Company	76	3.05	.691	.079	2.89	3.21	2	5
Private Owner	19	3.00	1.054	.242	2.49	3.51	1	5
Total	319	2.57	.736	.041	2.49	2.65	1	5

Source: Field Survey (2019)

Levene's test for homogeneity of variances is used to test whether the variance in scores is the same for each of the three groups. The significance value **(Sig.)** for Levene's test (p=0.006) is less than 0.05. Thus, the assumption of homogeneity of variance is violated.

Table 9: Test of Homogeneity of Variances

Level of Operation Performance			
Levene Statistic	df1	df2	Sig.
5.249	2	316	.006

Source: Field Survey (2019)

Since, the assumption of homogeneity of variance is violated;

Robust Tests of Equality of Means (Welch and **Brown-Forsythe)** tests are preferable shown hereunder. For both the **Welch** and **Brown-Forsythe** tests (p=0.000<0.05) indicates that there is significant difference among groups.

Table 10: Robust Tests of Equality of Means

Level of Operation Performance				
	Statistic[a]	df1	df2	Sig.
Welch	30.533	2	43.277	.000
Brown-Forsythe	19.774	2	37.153	.000
a. Asymptotically F distributed.				

Source: Field Survey (2019)

This table gives both between-groups and within-groups sums of squares, degrees of freedom etc. Since the Sig. value (p=0.000) is less than 0.05, there is a significant difference somewhere among the mean scores on the dependent variable for the three groups. But it does not tell which group is different from which other group. The statistical significance of the differences between each pair of groups is provided in the table labeled **Multiple Comparisons,** which gives the results of the post-hoc tests (described below). The means for each group are given in the **Descriptive** table. The overall Sig. value (p=0.000<0.05), indicates a statistically significant result somewhere among the groups. Having received a statistically significant difference, we can now look at the results of the post-hoc tests.

Table 11: ANOVA

Level of Operation Performance					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	30.128	2	15.064	33.514	.000
Within Groups	142.035	316	.449		
Total	172.163	318			

Source: Field Survey (2019)

The post-hoc test in this table tells that exactly where the differences among the groups occur. Look down the column labeled **Mean Difference** and any asterisks (*) next to the values listed. The asterisk (*) indicates that the two groups being compared are significantly different from one another at the (p=0.000<0.05). The exact significance value is given in the column labeled **Sig.** In the results presented above, Associations operation performance is significantly different from Companies and private owners. On the other hand, for Companies and Private Owners the Sig value (p=0.950>0.05) and thus the operation performance of Companies is not significantly different Private Owners.

Table 12: Multiple Comparisons Using Post Hoc Tests

Dependent Variable: Level of Operation Performance Tukey HSD

(I) Respondents by Type of Transport Operator	(J) Respondents by Type of Transport Operator	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Association	Company	-.682*	.089	.000	-.89	-.47
	Private Owner	-.629*	.160	.000	-1.01	-.25
Company	Association	.682*	.089	.000	.47	.89
	Private Owner	.053	.172	.950	-.35	.46
Private Owner	Association	.629*	.160	.000	.25	1.01
	Company	-.053	.172	.950	-.46	.35
*. The mean difference is significant at the 0.05 level.						

Source: Field Survey (2019)

The mean plot in Fig. 7 below provides an easy way to compare the mean scores for the different groups. You can see from this plot that Associations recorded the lowest scores (low level of operation performance), and Companies recording the highest score (high level of operation performance) compared to Associations and Private Owners.
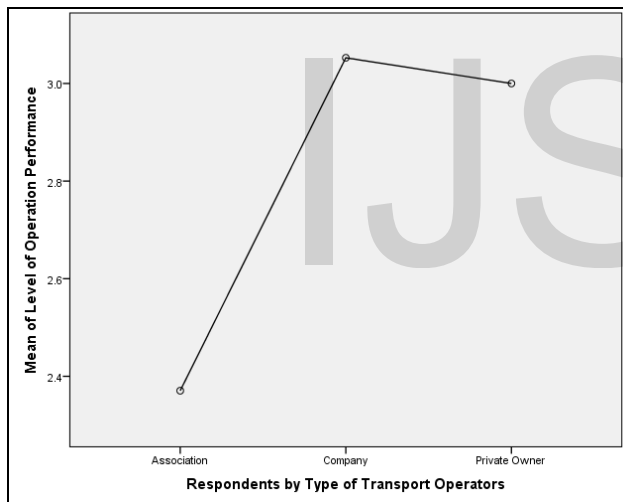

Fig. 7: Means Plots of Level of Operation Performance
Source: Field Survey (2019)

Interview result also indicates that there is difference in operation performance of cross border dry cargo road transoport operators. Accordingly, companies are relatively better than private owners and associatons, and private owners are also better than associations in their operation performance. Transport companies provide fast delivery of cargo as per the demand of transport service users than Associations and private owners in the country. So, due attention should be given by the government to improve the operation performance by implementing various measures.

5. CONCLUSION
The result of this research is expected to contribute new knowledge in the area of freight transport operation and management. Thus, it will be valuable for the operation efficiency of those transport operators. Based on the findings of the study cross-border dry cargo transport operators are organized in three forms (Association, Company and Private Transport Owner). Associations are the largest in number with highly fragmented and loosely organized structure.

Most of the cross border dry cargo road transport operator, particularly Associations have no operation performance target and did not properly measure and record operation performance using key performance indicators. The overall operation performance of the operators is low to medium; particularly associations' have low operation performance compared to Companies and Private Owners.

The analysis of variance (ANOVA) shows that, there is a significant difference among operators on level of operation performance for the three groups, where Associations operation performance is significantly different from Companies and Private Owners. On the other hand, the level of operation performance of Companies is not significantly different from Private Owners.

6. RECOMMENDATIONS
Based on the findings the researcher forwarded the following recommendations in order to improve the operation performance of the road transport operators:

- In order to keep pace with the growing economy, the government should give due attention to the road freight transport sector by strengthening the operators' capacity.
- It order to have efficient and strong transport operators, the government should have to encourage transport companies and private owners as they are relatively better than association and limit the number of associations.
- The government should have to also consider transforming the road freight transport by developing regulatory frameworks that helps to transform associations into strong share companies.
- The operators should have to set operation targets, measure their operation performance daily, monthly, semi annually and annualy in order to check whether they are efficient or not in their operation performance.

7. FUTURE RESEARCH DIRECTION
This research can be extended to incorporate other operation performance dimensions such as vehicle fill, fuel consumption, vehicle utilization rate and others for better understand operation performance of road freight transport service providers. Furthermore, the study can be extended to inland (local) road freight transport operators to get a more generalized overview of the road freight transport sector in the country.

8. ACKNOWLEDGMENT

9. REFERENCES

[1] World Bank and Innovative Research University (IRU). (2018). Road Freight Transport Services Reform: Guiding Principles for Practitioners and Policy Makers.

[2] Innovative Research University (IRU). (2019). The importance of truck transportation, Geneva. Available at: <https://www.iru.org/who-we-are/about-mobility/trucks>. (Viewed on 25 November 2019).

[3] World Bank Group (WB). (2019). Transport Overview, Available at: <https://www.worldbank.org/en/topic/transport/overview>. (Accessed on 28 October 2019).

[4] World Trade Organization (WTO). (2010). Road freight transport service, Council for Trade Service, S/C/W324.

[5] McKinnon, A. (2015). Performance measurement in freight transport, International Transport Forum, Kuehne Logistics University, Hamburg, Germany.

[6] Zerelli, S. & Cook, A. (2010). Trucking to West Africa's landlocked countries: Market structure and conduct, West African trade hub technical report.

[7] Afro Consult & Trading PLC. (2014). Final report of national freight transport and logistics program of Ethiopia, Addis Ababa, Ethiopia.

[8] World Bank (WB). (2009). Freight transport for development toolkit: the road freight, Transport Research Support Program, Washington DC.

[9] Raballand, G, et al. (2008). The impact of regional liberalization and harmonization in road transport services a focus on Zambia and lessons for landlocked countries, Zambia.

[10] Kenyan Transporters Association (KTA). (2019). Annual magazine update in Kenya, available at: <http://www.kta.co.ke/index.php/about-kta/the-secretariat>. [Accessed on 28 November, 2019].

[11] Addis Ababa Chamber of Commerce and Sectoral Association (AACCSA) with Swedish International Development Aid (SIDA). (2009). The management of commercial road transport in Ethiopia, Addis Ababa, Ethiopia.

[12] Federal Transport Authority (FTA). (2019). Annual road freight transport report, Addis Ababa, Ethiopia.

[13] Randall, WS, Defee, C.C. and Brady, S.P. (2010). Value propositions of the US trucking industry: Transportation Journal, 49 (3), pp.5-23.

[14] Georgios, C. (2015). Differences between unimodal and intermodal transportation networks, Master Thesis, Aarhus University, Business and Social Sciences.

[15] Cottrell, W. (2008). Performance metrics used by freight transport service providers, California State Polytechnic University, Department of Civil Engineering, California.

[16] Freight Best Practice. (2009). Route to operational efficiency, Available at: <http://www.freightbestpractice.org.uk> (Viewed on 12 October 2019).

[17] World Bank (WB). (2009). Road Freight Industry in Low and Middle Income Countries, Wahington Dc.

[18] Asnake Tadesse. (2006). Road freight transport in Ethiopia with special emphasis on Addis Ababa-Djibouti corridor, Master's Thesis, Addis Ababa University, Ethiopia.

[19] Economic Commission for Africa (ECA). (2009). Africa review report on transport, Available at , <https://sustainabledevelopment.un.org.pdf>. (Viewed on 20 December 2019).

[20] Kothari, C, R. (2009). Research methodology: methods & techniques, New Delhi, India.

[21] Federal Transport Authority (FTA). (2013). A regulation to license and renew cross border dry cargo road transport operators, regulation No.01/2013, Addis Ababa, Ethiopia.

[22] Nathan Associates Inc. (2013). Development of a national logistics strategy for Ethiopia: Diagnostic analysis of the current logistics system, Addis Ababa, Ethiopia.

[23] Debela, F. (2013). Logistics practices in Ethiopia, Master's Thesis, Swedish University of Agricultural Sciences, ISSN 1654-9392, Uppsala, Sweden.