# ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF MANAGEMENT

# FREIGHT TRANSPORT SERVICE AND INTERNATIONAL TRADE WITH ITS IMPLICATION FOR GLOBAL COMPETIVENESS


**BY**

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FREIGHT TRANSPORT SERVICE AND INTERNATIONALTRADE WITH ITS IMPLICATIONS FOR GLOBAL COMPETATIVENESS

By

GOBU ETICHA

A thesis submitted to the School of Graduate Studies of Addis Ababa College of Business and Economics School of Management in partial fulfilment of the requirements for the Degree of Master of Science in Management

## Approved by Board of Examiners

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# DECLARATION

I, the undersigned, and I hereby declare that the dissertation entitled: Freight transport service and international trade with its implications for global competitiveness,. It is my original work and has not been presented for a degree in any other University, and that all the sources of materials used for the thesis have been accordingly acknowledged.

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# CONFIRMATION

I hereby claim that to approve, the study made by Gobu Eticha, entitled: Freight transport service and international trade with its implications for global competitiveness, and submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by: -

Advisor _____

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# ACRONYMS

| | |
|---|---|
| **CCI** | Concurrent Competitiveness Index |
| **DBR** | Doing Business Report |
| **EU** | European Union |
| **FDI** | Foreign Direct Investment |
| GATT | General Agency of Tariff and Trade |
| **GC** | Global Competitiveness |
| **GCI** | Global Competitive Index |
| **GDP** | Growth Domestic products |
| **GDR** | Growth Domestic Reports |
| **GII** | Global Innovation Index |
| **GNP** | Growth National products |
| **ITF** | International Transport Forum |
| **LLC** | Land Locked Countries |
| **LLDC** | Land Locked Developing Countries |
| **LPI** | Logistic Performance Index |
| **MNCs** | Multinational Companies |
| **MTO** | Multimodal transport operator |
| **NIC** | Newly industrialized countries |
| **OECD** | Organization for Economic Cooperation and Development |
| **RoRo** | Roll-on-Roll-of |
| **Tkm** | Ton-kilometer |
| **UNCTAD** | United Nations Conference on Trade and Development |
| **USD** | United State Dollar |
| **WB** | World Bank |
| **WEF** | World Economic Forum |
| WILS | World Institute of Logistic Solution |
| **WTO** | World Trade Organizations |

# Contents

# LIST OF FIGURES

## LIST OF TABLES

# Abstract

*The global economic development has widened, deepened and accelerated, by the freight transport service and international trade flow systems in global context had to adapt. The service has plays a key role in terms of ensuring economic growth and maximizing social development as well as the system has a key element in logistics chain, to joins the separated activities and adapting the process of conveying different types of goods from one point to another using a variety of transport modes. The main objective of this study has to assess the fright transport service on international trade with its implications for global competitiveness. A descriptive followed by longitudinal research design was used. In order to provide the results which had been focussed to answer the stated problems and meeting to the research objectives, secondary data were used. The data were sourced from international organizations policy and standards documents and international organizations annual reports for the year 2007-2018 by using the two indexing systems. Moreover, in order to achieve the objectives of the study and thereby give answers for the basic research questions, quantitative research approach had been used. The data were entered, manipulated, organized and analyzed using Excel and Statistical package for Social Science with version 24. Both descriptive and inferential analyses were used to identify and determine the fright transport service on international trade with its implications for global competitiveness. According to the result illustrated, out of the five-independent variables, Growth Domestic Product, Distance, Infrastructure, landlocked and Timelines were found to be significantly important factors to determine the fright transport service and international trade with its implications for global competitiveness. Therefore, countries especially the developing ones to be competent in the global trade, they should give more emphasis on those components. They should invest on infrastructure, improvement in efficiency of customs operations area, employing adequate skilled logistic staff, improving the reliable timeline, and quality of logistics service of the ports.*

**Key words:** International trade, Global competitiveness, logistic performance index, Freight transport service

# CHAPTER ONE

# Introduction

## 1.1. Background of the study

Transport has a key role in terms of ensuring economic growth and maximizing social development. The system is a key element in logistics chain, it joins the separated activities. Freight transportation is the process of conveying different types of goods from one point to another using a variety of transport modes. Transport service industry comprises of several modes which range from air, water, railways, pipelines and road transports. Pipelines are used to transport items which are liquids and gaseous in nature while air, water and roads are used to transport goods and passengers. So, transportation is the process of conveying different types of passengers, goods and services from one point to another using a variety of transport modes (Shewangizaw Dagmawi, 2009).

The integration of transportation services and interaction among the different modes of transport chain influences the success of international trade. Freight transportation is critical to economic growth in any country. Efficient freight transport and logistics systems can strengthen the business competitiveness of a country (Wisetjindawat, 2011). Truck, rail, water, air, and pipeline services provide a spectrum of competitive and complementary freight transportation options, with each mode offering advantages and disadvantages in terms of price, speed, reliability, accessibility, visibility, security, and safety (Brogan *et al.,* 2013). An effective transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality (Shewangizaw Dagmawi, 2009).

Transportation is an essential part of human activity and in many ways form the basis of all socio-economic interactions. Any kinds of freight transport service are essential to support economic growth and development. Transportation industry for any country which means promoting the social and economic life; it enriches trade whereby the country's manufacturing industrial products, tourism, liquid products and distribute. Therefore, effective and efficient transport operation practice increases the country economic development and strategic roles in the national as well as global economic development.

In fact, the advancement in transport, logistics and communication technologies has revolutionized total manufacturing, value adding and distribution, as well as the consumption process and the world

has become ‘virtually a global village’ (Mooy, 2000). For instance, the producers, intermediaries, shippers and consignees, located often thousands of miles distant from each other, require efficient transport and logistics services to get the right product with the right quality and quantity to a right place within the right time and above all at a right price (Martin, 1996; Coyle *et al*., 2003). Thus, the first and most important task for a transport carrier or a logistics service provider is to provide the best possible customer-oriented service for a well-balanced price and quality ratio (Wiegmans *et al*., 2001). Consequentially, the globalization of trade have dependent on the transport system with factors such as quality, cost and time (Banomyong and Beresford, 2001).

Distance, among other factors, separates markets, manufacturers and suppliers in the supply chain (Zeng and Rossetti, 2003). So, in order to fill the separation or services bridge the spatial gap between various points, transport play a vital role. From an economic point of view, transport adds value to a company by creating time and place utility; the added value is the physical movement of goods to the place and at the time desired (Coyle *et al.*, 1996: 318). Apart from bridging the particular gap, it is also associated with the flow of information and cash transactions. Indeed, transport and logistics excellence has become a prerequisite to achieving a world-class supply chain (Zeng and Rossetti, 2003). Transport is also viewed as a technological and organizational system with the aims of transferring passengers, good and services from one destination to another in order to balance the spatial and economic gap between demand and supply chins (Hayuth, 1987).

The capacity of fright transport service is rising at high rate and crossing international borders. Studies indicate that this growth in freight transport with resulting congestion of road transport made intermodal freight transport to be among high priority agenda among the public, private players, and academia (Bontekoning and Priemus, 2004). In that regard, this study tries to assess freight transport service and international trade with its implication for global competitiveness.

## 1.2 Statement of the problem

The ultimate focus of the study was to evaluate the freight transportation service and international trade with its implication for global competitiveness under the considerations of economic characteristic, timelines and cost due to inadequate physical infrastructure and inefficiency partly attributed to limited skills pool that was a common feature in the transport industry. The cost of transport is a major component of the cost of doing business for manufacturer’s countries. It is a key contributor to the competitiveness of firms involved in import and export. Key factors that raise costs

include low productivity of the trucking industry in developing countries, notably because of infrastructure constraints (Pedersen, 2001); low levels of competition between service providers (Rizet and Hine, 1993); and weak infrastructure (Limao and Venables, 2001). Limao and Venables (2001) also suggested that weak infrastructure accounted for most of the developing countries poor trade performance.

The developing countries need to be integrated with global economy and that can be simplified through efficient and effective movements of goods to and from one country in international trade and within the regions or nations as well as international trade. To this end, the countries need an efficient and effective intermodal transport system for international and national trade competitiveness. Their freight transport service is characterized by many constraints or problems including underdeveloped system and fragmented means of transportation, poor and lack of transport and logistics infrastructure like roads warehouses and cold chains, etc. Very high accidents and congestion in cities at inlets or outlets of cities, lack of coordination of goods transport, damage of goods and quality deterioration due to inappropriate storage, packaging, and transporting (Debela, F.M, 2013; Asnake Tadesse, 2006).

Moreover, the studies had been done on the case of logistic transport sector indicated that the logistic transport sectors face various problems especially with rendering quality dry port service and transport performances in relation to delays (Fekadu M., 2013; Kalkidan Waktola, 2017).

According to Konings *et al.* (2008), the importance of freight transport services is mainly functioning in both national and global economy is clear but as transport volumes are eternally growing and the problems of accommodating the freight flows in an efficient and sustainable way is a real challenge. Traffic congestion is rapidly growing, and lead-time delay is happening, the service quality of freight transport couldn't satisfy the increasing demand of customers. The performance of the system affects public policy concerns like air quality, environmental, resource consumption, social equity, land use, urban growth, economic development, safety, security and finally exposes to trade cost. Considering these problems, there is a great challenge to achieve a breakthrough in the performance of freight transport systems.

The roles of transportation service sectors, its social benefits and the countered problems in the world economy are better not recognized, from the above-mentioned studies; whereas, the challenge of transport service and trade simplifications, need more emphasis and study. There is no adequate

study on the sub sector and although significant advances have been made to allow the transport industry trends in relations to international trade as a whole. In that regard these studies tries to evaluate the fright transport service and international trade with its implications for global competitiveness.

## 1.3 Research questions

In line with the broad purpose statement highlighted above, the following specific research questions have been formulated:

- What is the extent of freight transport service and its implications on the international trade with the consideration of top-ten upper and lower countries?
- What is the relationship between freight transport service and global competitiveness?
- What are the determinants of freight transport service on international trade performance within the top-ten upper and lower countries?
- What is the extent of international trade competitiveness in service for top-ten upper and top-ten lower countries?

## 1.4 Objectives of the study

### 1.4.1 General objective

The main objective of this study is to assess the fright transport service and international trade with its implications for global competitiveness.

### 1.4.2 Specific Objectives

Based on the above general objective, the study specifies the following objectives:

- To examine the extent of freight transport service and its implications on the international trade with the consideration of top-ten upper and lower countries;
- To examine the relationship between freight transport service and global competitiveness;
- To determine the freight transport service on international trade performance within the top-ten upper and lower countries; and
- To examine the international trade and its implications of competitiveness in service for top-ten upper and lower countries.

## 1.5 Significance of the Study

This study asses the fright transport service and international trade with its implications for global competitiveness. So, it is important for providing information on what are the determinants of freight transport service on international trade performance and international trade competitiveness. Moreover, it offer analyze possible impacts of transport service performance on its international trade competitiveness based on the causal relationship. And it is expected that the fright transport service measures the implications of competitiveness using Transport or Logistics Performance Index (LPI) and Global Competitiveness Index (GCI).

The Logistics Performance Index (LPI) embodies the experience of logistics professionals worldwide and tries to capture the complexity of supply chains in synthetic indicators that are comparable across countries. Therefore, both GCI and LPI will have provided valuable information for policy makers, traders, and other stakeholders, including researchers and academics, on the role of logistics for growth and the policies needed to support logistics in areas such as infrastructure planning, service provision, and cross border trade and transport facilitation.

## 1.6. Scope of the Study

In order to make the study more manageable, it would be delimited in concepts or issues, geography and time. Regarding the concepts, it is delimited to freight transport service and international trade with its implication for global competitiveness. Transport can encompass air, water, railways, pipelines and road. But this study focuses on freight transport service in any mines of transport except pipeline. Moreover, the study will also delimit with the countries those have appropriate annual LPI and GCI information within the past 12 years before 2018 G.C. Geographically the scope of this study also delimits internationally. Concerning the time, the study is confined to freight transport service and international trade with its implication for global competitiveness during the years 2007 up to 2018.

## 1.7 Limitations of the Study

Irrespective of the nature of the study, every research is subject to different shortcomings. Based on this, the study is limited only to the competitive advantage variables that are indexed in the LPI and GCI indicators. As the study is time serious in nature, the possibility of recorded biases resulting in

under or over reporting and misreporting of events is likely. In addition, due to the in availability of annual LPI and GCI data, the study specifies only those have available data within the past 12 years. This may not indicate the real image of the entire world. Due to time and cost constraints, the study also has been took a report of the first top-10 highest and top-10 lowest LPI and GCI scored countries data. So, this may reduce the International Trade and global competitiveness quality.

## 1.8 Definition of terms

**Logistics Performance Indicators (LPI):** refers to the pro-competitive business and benchmarking tools to promote efficient, effective, reliable and sustainable transport logistics and infrastructure systems. These tackle congestion, to improve efficiency and promote alternative modes of transport.

**Competitiveness:** means the ability of companies and industries, regions, nations and multinational units to generate relatively high-income levels from production factors, but also their use at a sustainable level in the current competitive environment (OECD, 2017). Most often, the competitiveness is assessed at company level.

**International trades**: -definition as the exchange of goods and services across international borders or territories.

**Globalization:** in a broader stroke defined as the issues that including capital flows, information and knowledge flows, uniformity in culture and other issues in the globe (J. Stiglitz, 2006).

**Intermodality:** is a characteristic of a transport system that allows at least two different modes to be used in an integrated manner in a door-to-door transport chain. (Commission in COM (97) 243 final document)

## 1.9. Structure of the Study

This study organized with five chapters. The first chapter describes the background of the study, the research problem, research question, objectives, and significance of the study, delimitation of the study, definition of terms and organization of the study. Chapter two reviews the literature which leads to the development of conceptual framework. Chapter three also deals with the method of the study. Sources of data and variables, methods of data analysis are described in this part. Chapter four discusses the results and analysis. Conclusion and recommendations, and suggestions for further study are covered in Chapter five

# CHAPTER TWO

# Literature Review

## 2.1. Introduction

This part of the study deals with review of related literature to the problem of the study. It discusses about freight transport service, fright transport service and international trade, fright transport service modes, fright transport service selection criterions, fright transport and competitiveness, the impact of transport service, transport logistics in the global world, fright transport service in developing countries, fright transport service in land locked countries, global and international trade, global and competitiveness, measure of logistic performance and global competitive index.

## 2.2. Theoretical review

### 2.2.1 Freight Transport service

Transportation service helps to shape, promotes a nation's economic health and quality of life. Not only does the transportation service provide for the mobility of people and goods, it also influences patterns of growth and economic activity by providing access to land. According to Global Highlights (2010), the transportation of freight among countries internationally involves complex structure in a long-distance transportation system. It involves many stakeholders such as shippers, carriers, third party logistic providers, consignees, seaports, airports, and a multiple modes of transport service.

### 2.2.2 Freight Transport Services and International Trade

The term "transport services" is used broadly to denote any service that is useful in accomplishing international merchandise trade. As goods are exchanged across national borders, demand for services that provide to that trade is likely to be created. The most obvious mods in International Transportation Service are air, rail, and maritime transport services, which are crucial in physically moving goods from the exporting to the importing country. Other types of services such as finance, communication, and several professional services are also very important in order to complete the international exchange of goods.

Transportation services is critical for how supply chain functions, how raw materials get to factories, how goods get to markets, how food gets from farmers to kitchen tables, how peoples travel from original destinations and share their norms into others place and how energy products move from areas of production to areas of consumption (Nation, 2013). Therefore, freight transportation is critical to economic growth in any country. Efficient freight transport and logistics systems can strengthen the business competitiveness of a country (Wisetjindawat, 2011). Truck, rail, water, air, and pipeline services provide a spectrum of competitive and complementary to freight transportation options, with each mode offering advantages and disadvantages in terms of price, speed, reliability, accessibility, visibility, security, and safety (Brogan et al., 2013).

The significance of freight transport service is to stimulate both local and global economy or to simplifying international trades flow. As transport service volumes are ever growing and the problems of accommodating the freight flows in an efficient and sustainable way is exposed to a real challenge. An effective transport service in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. There are many components of logistics that interact to impact supply chains and ultimately influence international trade flows. Transport is the single most expensive component of logistics; it joins the separated activities (Shewangizaw, 2009).

### 2.2.3. Freight Transportation Service Modes

The transportation mode available for goods transportation, that is external transports, is by road, rail, air and sea. The modes can also be combined to cover the whole distance to the end destination by intermodal transportation (Jonsson, 2008). The modes advantages and disadvantages are presented and discussed in each mode:

#### 2.2.3.1. Freight Road Transportation Service

Road transport is used for both long and short transportation distance, as the method offers accessibility and uninterrupted transport to plants located on the same continent. The flexibility of destinations and variation of goods which are possible to transport, makes the mode suitable to apply in different markets (Jonsson, 2008). Several restrictions for other modes are non-essential for road transportation, for instance the size and value of goods; whereas, weight or distance are a limitation, as the flexibility of the mode offers tailor made solutions (Jonsson, 2008; Reis, 2014). The flexibility of road allows it to reach every customer, adjust to changes in traffic and offers the customer, the

control of fast adjustments of arrivals and departures (Reis, 2014). The mode specific environmental consequences are in form of exhaust emissions, noise, road safety and traffic congestion (Jonson, 2008). Road transportation is depended upon in most developed countries for national freight transportation, even though it is the most expensive and resource-consuming option (Medda and Trujillo, 2010).

Infrastructure which is utilized by road transportation is governmentally funded and provided free of charge in many European Union (EU) countries. This is slowly changing as road user charges are introduced in several EU countries, such as in Germany. The charges are aimed at recovering capital and maintenance cost. The direct financing, planning and provision of road infrastructure are controlled by the public-sector rather than the market. The favoritism of road transportation can thus be explained (Baird, 2007).

#### 2.2.3.2. Rail Transportation Service

The advantage of rail transportation, compared to road, is in transportation of large quantities combined with long distances and high-volume goods. The mode is capable to transport all type of goods, but high-value goods are less suitable as this can generate large amounts of tied-up capital. The mode has a disadvantage compared to road transportation regarding transportation time. Although, rail offers speed over long distance, the same route is less time consuming with road transportation. The type of goods selected for this mode are similar to maritime transportation, such as ore or timber, and rail has a large market share of the latter (Jonsson, 2008).

Compared to road transportation, rail has a disadvantage of less frequent departures, the network is not well developed and flexibility of rail regarding time and geography is a restriction. However, the disadvantage is possible to overcome by application of combined traffic. Rails advantage is of environmental cleanliness as a large quantity of goods can be transported over long distances without direct exhaust emissions that are if the locomotives are electric. Furthermore, the mode is energy-efficient when the fill-rate is high (Jonsson, 2008). The other disadvantage of rail is a finite capacity, track space is competing between freight and passengers and issues of connectivity across national borders. Additionally, the increase of capacity is limited by high capital cost and constrained legislation. The railway infrastructure, similarly, to road, is financed, planned, maintained, and owned by the public sector; thus, depend on governmental subsidies (Baird, 2007).

#### 2.2.3.3. Air Transportation

The advantages of air transportation are within speed over long distances. Generally, the mode is used for high-value goods and/or low weight, time-sensitive express deliveries and emergency deliveries. Consequently, these types of deliveries are used as the mode has the highest cost per ton-kilometer (Tkm), i.e., quantity in tones multiplied by kilometers transported. Therefore, low-value goods and high volume are not suited for air transportation. Also, the mode is restricted regarding direct transportation as it is limited to terminals. The largest competitors are container ships between continents, within continent the mode competes with road transportation (Jonsson, 2008).

#### 2.2.3.4. Maritime Transportation

Maritime transportation is a perquisite to global trade, 80 percent of global goods trade are transported by ship (Berle *et al.,* 2011). Compared with other modes, maritime transportation is the most time demanding. The transportation can be performed between ports and directly to a plant when the plant has port access (Jonsson, 2008). The port serves as a terminal or a node which enables the interchange of goods on a given route. Moreover, it is the interface between sea- and land-based modes, or a trans-shipment of goods between ships (Baird, 2007). Ports can have the advantage of scale economies but still be limited by lacking infrastructure and facility space. An expansion can be hindered by lack of space, policy or funds (Hesse and Rodrigue, 2004).

Ships are usually adapted to transport specific types of goods and routes. The varieties are container ships or Roll-on-Roll-of (RoRo) rolling carriers (trucks, trailer, cassettes and railway wagons). The goods transported by both methods are similar, but the RoRo traffic is most commonly used within continents; whereas, containers are shipped between continents. The economy of scale focuses the container flows to ports which are equipped with cranes and facilities to handle the container traffic. Container traffic is therefore common in ports which can handle large trans-oceanic ships. Bulk ships are equipped to transport solid goods, such as ore, whereas tanker ships carry liquid loads. The loading and unloading time for bulk is usually short (Jonsson, 2008).

The competitive advantage of the mode is within shipping of low-cost, bulk loads combined with long distance of transportation; in this segment the competitor is the railway. The majority of transported goods are of petroleum variety, but goods in bulk are also common; for mid-value goods, container shipment are also commonly applied (Jonsson, 2008). Maritime transportation presents the lowest operations cost per km, as well as the advantage of loading capacity compared to other modes.

Nevertheless, related to the high energy consumption, the emissions are relatively high (Jonsson, 2008). Certain advantages of maritime transport are specific for the mode, such as lack of traffic congestion and that capacity can be increased in a multiple way by increasing size and/or speed of ships or addition of more ships (Baird, 2007). Flexibility offered by the mode is considering transportation routes (Jonsson, 2008) but flexibility regarding response to unexpected demands is restricted (Beuthe and Bouffioux, 2008).

### 2.2.4. Freight Transportation Service Selection Criterions

Location of a production facility determines which transportation mode is relevant to utilize. Other aspects of mode decision are the modes transit time and material flow cost derived from both the location and the possible connection to infrastructure (Son *et al*., 2013). The goal of logistics is to create competitiveness and high performance, which is achieved by improvement of efficiency and effectiveness, by which the profitability of a company can be affected. To evaluate performance, a company can set and follow up goals regarding certain variables, such as customer service, flexibility and time. Different modes have various characteristics which can help to achieve the goals of the supply chain and logistics that a company might have (Jonsson, 2008).

#### 2.2.4.1. Cost Factors

The total cost of transportation includes carrying, transferring/transshipment, loading and unloading, thus cost arises from performed activities (Beuthe and Bouffioux, 2008; Jonsson and Mattsson, 2011). Transport lead to tied-up capital during transportation, further cost is derived from stock-keeping, capacity-related costs and shortage-and delay costs. The different sources of cost demand a holistic perspective as adjustment and decrease of cost in one activity, often leads to transference of the cost to another activity (Jonsson and Mattsson, 2011).

The cost aspect is weighed highly, approximately 60 percent, by decision makers regarding transportation mode selection. Competitive pricing is therefore an important aspect to consider as a transport provider. Rail and inland waterways lead to higher costs; however, the additional costs of the modes are more beneficial over long transportation distances where they can be more cost competitive. Road transportation is dominated over short distances. Moreover, if the transportation distance is less than 300 km, total cost is more important than transport time. The cost aspect is also

important in distances longer than 700 km; this distance is where rail and maritime transportation has an increased probability of selection (Beuthe and Bouffioux, 2008).

#### 2.2.4.2. Time Factors

Transit time is correlated with cost. Shorter transit time provided by for instance air will result in a higher cost, and longer transit time provided by for instance rail is less expensive. Shorter transit time will however provide the supply chain with operations with less need for inventory and fewer backorders, leading to lower costs of the material flow. Backorders can be a result from a longer transit time as there is a correlation between transit time and the order quantity when replenishing the inventory (Son *et al*., 2013). Time is weighed as the next most important criterion (Beuthe and Bouffioux, 2008) especially by the transportation provider as the gains of fast transportation is more to the advantage of the provider than the purchaser (De Jong *et al.*, 2014). Additionally, time criterion is rated higher for high-value goods over short distances (Feo-Valero *et al.*, 2011).

#### 2.2.4.3. Frequency Factors

The variable of frequency can affect the mode selection decision (García-Menéndez *et al.* 2004). The delivery frequency is defined by the number of transports performed during a time. A high frequency enables the transportation purchaser to adapt to sudden variation of demand, with the benefit of an increasing flexibility in the supply chain. Additionally, stock capacity in the companies can decrease leading to a decrease of stock-keeping costs (Naim *et al.* 2006). Delivery flexibility is considered to be an important service attribute and means the capacity to adapt to and comply with changing customer requirements. The flexibility to changes of delivery volume or time is commonly requested. Flexibility has an indirect consequence on customer service as well as the cost and tied-up capital, which can be achieved by offering the option of variation of delivery volume. Delivery flexibility can thus create customer value (Jonsson, 2008).

#### 2.2.4.4. Reliability Factors

Reliability is defined as an average transportation delay (Arencibia, *et al.* 2015) and can be seen from two dimensions. Either a need from a Just-In-Time buyer to receive the goods within an acceptable time window related to the production process input, or the reliability needed to reduce buffer stock by which the cost of keeping inventory is minimized (Brooks, *et al*, 2012). Backorders can affect customer satisfaction which can compromise trust and loyalty and thus the relationship between a

company and their customers. This can be prevented by keeping a higher level of inventory (Son *et al.*, 2013). Reliability and flexibility are of importance when transportation purchasers are using the road transportation in distances of less than 300 km for those attributes, which makes a modal shift unlikely as the focus is rather on optimizing the road transportation (Beuthe and Bouffioux, 2008).

### 2.2.5. Fright transport and competitiveness

Competitiveness, as such, is not an established term in the lexicon of economics. It came into common use in the 1980s, when there was considerable public discussion about the rise of Japan as an exporting power and the rising tide of imports of manufactured goods began flowing into the United States. The term was generally used to mean the ability to compete with manufacturers in other countries. It was never precisely defined in economic terms; however, it is important to define competitiveness in clear economic terms so that it becomes measurable. It is also the case that thinking of economic performance only in terms of international competition is too narrow a concept (Laurence O, 2015).

By expanding market access to suppliers and customers, improved freight transportation creates more competition for all businesses affected. Over the long run, this enhanced competition can also lead to greater efficiency as all market participants are compelled to innovate and lower costs in the presence of additional competitors (Laurence O, 2015).

As the world manufacturers become more productive, they are better able to compete in global markets. But that is only part of the story. As the internal manufacturing and distribution systems become more productive, the nation's standard of living rises. More and better goods are available to consumers using the same levels of labor and capital (Laurence O, 2015). Therefore, these are more competitive goods, so more of them are likely to be exported. One effect of rising exports is that consumers get to choose among a wider array of goods, from both foreign and domestic sources.

### 2.2.6. The implication of Transportation Service, Cost and International Trade

Coyle, *et al*. (2003:339) stated that transportation is the physical thread connecting the company's geographically dispersed operations. More specifically, transportation adds value to the company by creating time and place utility; the value added is the physical movement of goods to the place and time desired. Moreover, they add transportation permits goods to flow between the various fixed points and bridges the buyer-seller gap. Transportation providers utilize resources to make possible

the physical movement of the goods, and they must recover the cost of providing this service transportation cost

The transportation cost incurred by a country when importing goods varies from a few percent of the value of trade, up to 30-40% for the most remote and landlocked countries. And the consequences of this high transportation cost are: using up scarce resources and choke off trade (Henderson et al., 2001:5). The trade value-transportation cost link is so tight that according to Martinez-Zarzoso et al. (2003) findings. As their report doubling transport costs leads to a reduction in import value of between three and five times. In a less, aggressive way Henderson *et al.* (2001) estimate that doubling transport costs reduces trade volume by around 80%. So, the trade reducing effect is strongest for transport intensive activities; i.e., activities that are dependent upon exports for sales and/or imported intermediate goods for production (Henderson *et al.,* 2001:6). It is so strong the importance allocated to transportation cost that Martinez-Zarzoso *et al.* (2003:180) affirm that to some extent, import choices are made in order to minimize transportation costs.

### 2.2.7. Transport logistics in the global world

From a global perspective, movement of commercial trade across the globe has witnessed a well-coordinated transport network through economic liberalization making it possible for firms in the industrial and retail sector to register tremendous growth, with particular reference to the developed countries (Schramm, 2003). Over the years, most developed countries have been able to grow their economies through the network of the global village approach where importers and exporters from Europe, China, Asia, Middle East, Japan and Africa interact online and establish business deals that involve moving a large volume of trade using several modes of transport consolidated by a number of players such as freight forwarders (Schramm, 2003). Transport logistics operations determine the efficiency of moving products to international markets irrespective of distance so long as it is well coordinated and is moved with speed, reliability and in the most cost-effective manner (Tseng *et al.*, 2005).

The marine transport sector has the largest shares of global merchant trade covering 90 % of international business volume. Large shipping lines move huge volume of trade between ports and are complimented by hinterland intermodal transport services such as rail, road and inland waterways (Grosso *et al.* 2014). Much as the marine transport sector is relatively cheaper in terms of shipping

goods, the movement of goods from ports to hinterland in terms of costs is rather prohibitive. Hartzenberg (2011) illustrated that shipping a car from Japan to Abidjan could cost one thousand five United States Dollars inclusive of insurance, while the cost of moving the same unit from Addis Ababa to Abidjan would cost five thousand United States Dollars

Djankov *et al.* (2006) further observed that it takes 116 days to move an export container from factory in Bangui (Central Africa Republic) to the nearest port for processing logistics formalities for exporting cargo and yet the same export formalities would take only 5 days from Copenhagen and 6 days from Berlin. Again, this confirms the disparity in logistics aspects between developed and developing countries to a certain extent.

In order to address the bottle necks that contribute to delays facilitating movement of commercial trade, developing economies in the Sub-Saharan countries need to review their transport regulatory framework and policies and implement the international conventions and instruments that facilitate trade as has been the case with the economies of the developed countries. The performance of freight forwarders is seriously challenged when institutional policies fail to address deficiencies in addressing barriers to trade.

### 2.2.8. Freight Transport Service in Developing Countries

Traditionally analysis and research in the field of freight transport look at the different freight elements of a supply chain on an individual modal basis, with only a few focusing on the intermodal supply chain (Ockwell, 2001). Moreover, according to Hilling, (1996: l) large parts of the Third World are characterized by lack of year-round mechanized transport and movement is by unreliable, high cost, labor-intensive methods Carriers are mostly single-mode and performing the transport function in a conventional method. Very little co-operation and co-ordination exists among the carriers of road, rail and inland waterways transport services and of services crossing the boundaries of neighboring countries' (UNCTAD, 1994a:19). From an organizational point of view this may be termed as a 'fragmented freight transport' system. Transport infrastructure is weak, capacity constrained and also inadequate and poorly maintained. Moreover, there is lack of transport management skills and resources to upgrade the transport and logistics system (Hilling, 1996; Simon, 1996).

The poor inland transport system compels the international shipping lines to transport only from ’port to port' or 'port-to-point' instead of 'door-to-door' as in developed countries. Ports and terminals are built with conventional jetty/piers and handling equipment and as a result, the ships calling at such ports need to be equipped with gear. A number of services including warehousing, stuffing and un-stuffing are mainly performed within the port area. The loading/ unloading process is mainly dependent on the output of unskilled people. Transport service providers concentrate on only one mode and do not have, in most cases, knowledge of other modes of transport. They are unaware of the latest logistics concepts and the ever-changing requirements for international and national trade and investment.

They are not trained to handle unitized or more specifically containerized cargo. Moreover, government regulations and controls restrict the inland movement of container (UNCTAD, 1994a). Enough information about multimodal freight rates or transit time is not available to shippers or consignees. Transport providers are unable to offer tracking and tracing services and, in most cases, have limited access to information technology such as electronic data interchange (EDI) or email. These factors are more crucial to small and medium size traders because the managers do not have the necessary knowledge and skill and they do not produce enough cargo to have leverage on transport decisions. On the other hand, the large traders or industries often have their own transport and logistics department with necessary skills and are able to produce truck load cargo (UNCTAD, 1994b).

### 2.2.9. Freight Transport service in-Landlocked Developing Countries

The landlocked countries face serious challenges in managing transport logistics. According to the research of Faye *et al.*, (2004) there are several factors preventing landlocked African countries from faster development. The ability of landlocked countries to trade is affected by high trade costs. Most landlocked developing countries are very poor. In fact, several landlocked developing countries are even moving further away from reaching their objectives.

The landlocked countries within Sub-Saharan Africa which faces serious challenges in managing transport logistics. The provision of predictable, reliable and cost-effective transport logistics is constrained due to deficiencies in road and rail infrastructure, inefficient port and transit border operations that contribute to very high transport cost. In fact, the first leading transport mode of those countries is road (Thomas *et al.,* 2008). Road transport is the mode of transport that the country relies

on for both domestic as well as international transport services (Debela, 2013). In those countries, the main challenges in the road transport sector include high transport costs due to high transit charges imposed by coastal country, cumbersome port and customs procedures and poor road infrastructure (Kifle *et al*., 2000).

### 2.2.10. Globalization and International Trade

Globalization in general terms are the process of broadening and extending the inter-relationships between international trade, foreign direct investment and portfolio flows. The consequence of globalization is creating a global marketplace for goods and services that is largely indifferent to national borders and governmental influence. Globalization since the 1960s have altered the production, export and employment structure of the world economy; but, many barriers to full integration still remained. Although analysts seem to differ on the policy implications of globalization, most would concur that the post-1980s episode is likely to herald more rapid international economic integration than previous episodes. Rapid technological change particularly the revolution in computing and communications technologies coupled with falls in barriers to international trade such as through the implementation of the Uruguay Round Agreements and economic liberalization in developing countries, have driven it. Also, other The World Trade Organization (WTO) agreements and regional treaties forced domestic markets to open up in that regard a means of communication and transportation like telecommunications, road, railway, marina and air transports widely support the organization agreement agenda..

Currently the most modern and dynamic industries are transnational in scope since they are the result of an integrated system of global trade and production. Therefore, the development options for many developing countries depending on a significant degree, on the kind of export roles they assume in the global economy and their ability to proceed to more sophisticated, high-value industrial niches.

### 2.2.11. Globalization and Competition

Globalization focuses on achieving 'one village'; i.e., a border-less world in terms of trade and investment and has extended its arena by including the flow of information as well (Zinn, 1999). Today successful Multinational Companies (MNCs) develop their products in the U.S. and Europe. Basically, they manufacture them in developing countries and then sell worldwide (Zeng and Rossetti, 2003). Thus, globalization has had a great impact on freight transport systems, because interactional trade, financial flows, FDI and other forms of trans border linkages among private firms have become the main features of globalization (UNCTAD, 2000a).

The argument for free trade was based on the considerations of specialization and international division of labor (Foster, 2003). In contrast, geographical and institutional divisions affect the construction of infrastructure, availability of transport networks and options, the operation of the transport service and thereby its quality (Rejmaud, 1998). These features can measure the level or degree of attachment of any country to the global village. Because of a dependence on global production and consumption as well as global competitiveness, trading companies are constrained in terms of transport by factors such as transit time, transport cost and costs from loss, damage and delay. The cost of transport is generally relatively higher in developing countries (UNCTAD, 1994b; Roberts, 2004). Industries in developing countries have to operate with highly inefficient transport systems and thereby lowering the competitiveness of their products in the global market (Gulyani, 2001; ADB, 2003). Nevertheless, globalization has increased prosperity and the potential for developing countries. At the same time, it has raised the risk of marginalization. For example, the income gap within and among the countries has widened, and the number of people living in poverty has increased. Asymmetries and imbalances in the international economy have been intensified (UNCTAD, 2000b).

### 2.2.12 Measure of Logistics Performance

The Logistic Performance Index (LPI) promotes the understanding of key issues and options for improvement of logistics performance. The LPI entails several components assessing the logistics environment: customs clearance performance, quality of transport infrastructure, competitive and efficient shipment process, logistics process quality, international tracing of shipments, and international shipments frequency. It also allows for assessment of logistics performance trends while performance is measured through a five-point scale. The general LPI of a country is the weighted average of the above-mentioned components. In addition, the LPI is a tool providing quantitative data on specific aspects of country's export and import procedures, delivery times, costs related to supply chains, customs clearance procedures, and the percentage of shipments subjected to physical inspection. (Arvis, J-F. *et al*, 2012), Trade logistics in the global economy: the logistics performance index and its indicators, (World Bank, 2012).

Policy measures have direct impact on a country's image as a business environment or foreign investments. The efficiency of the transportation system and inventory are directly related as higher turnover allows for shorter delivery time, higher responsiveness to demand changes and lower costs of transportation. On the other hand, transport infrastructure has a significant impact on the

productivity and the cost structure of businesses. Haughwout, A. F., Infrastructure and social welfare in metropolitan America, Economic Policy Review, Vol. 7, 3, 2001, pp. 43–54

The efficiency of the logistics systems is vital for ensuring economic development and attracting foreign investment. The index is applied for identification of the issues and opportunities as concerns each country's transport infrastructure, logistics and supply chains efficiency. Countries at similar performance levels may have substantially different ranks, especially in the middle and lower country income ranges (OECD/ITF, 2016).

### 2.2.13. The Global Competitiveness Index

Competitiveness is a basic condition for the existence of an enterprise and is realized as the ability to maintain and expand the assets of business owners (OECD, 2017). In this sense, the competitiveness of an enterprise is a matter of strategic importance and therefore it is an issue for the top management of a company.

Global institutions and organizations dealing with competitiveness evaluate it and compile competitiveness rankings of economies or businesses; they define this category for their needs and compile criteria and methods for competitiveness measuring.

As the name of the next indicator indicates, the Global Competitiveness Index (GCI) is geared to explore the ability of an economy to compete in international competition. Since 2004, it has been shown by the World Economic Forum (WEF). Previously, the Growth Competitiveness Index (GCI) and the Concurrent Competitiveness Index (CCI) have been reported. In 2007, the methodology for calculating the Global Competitiveness Index was changed and to evaluate the year-to-year changes, the past results were recalculated by a new methodology.

GCI consists of 12 pillars of competitiveness which are classified into three sub-indices based on the factors of production, efficiency, and innovation. Each of these pillars consists of 7-20 other sub-indicators. Some sub-indicators are evaluated on the basis of available statistical data; others are the result of the Global Executive Opinion Survey.

The rated states are classified into three development stages and two "inter-levels", as the criterion is GDP per capita and the primary products export share of total export. In the first development stage,

economies driven by production factors, there are classified countries of whose GDP per capita are less than 2000 USD and the primary products export share in total export is over 70%. The sub-indexes weight in proportion of 65:35:5 is applied for the countries in the first development stage. The second stage, economies driven by efficiency, there are states whose GDP per capita is in the range of 3000-8999 USD, as the sub-indexes weights are in the proportion of 40:50:10. In the third stage, the economy driven by innovation, there are states with a GDP per capita of more than 17000 USD and sub-indexes weights are 20:50:30

By calculating the GCI, it is very important to know the development stage in which the country is located; so, the scales can be set for the individual sub-indices. The countries are classified into individual stages based on GDP per capita. The individual scales are defined as essential requirements, factors determining efficiency, factors of innovation and sophistication (Table 2.1).

**Table 2.1**: Sub index weights and income thresholds for development stages

| **Stages and criteria for countries** | **Stage 1: Factor-driven** | **Transition from stage 1 to stage 2** | **Stage 2: Efficiency driven** | **Transition from stage 2 to stage 3** | **Stage 3: Innovation driven** |
|---|---|---|---|---|---|
| GDR per capita US$ thresholds | < 2 000 | 2 000 – 2 999 | 3000 –8999 | 9000 – 17 000 | > 17 000 |
| Weight for basic requirements | 60% | 40-60% | 40% | 20-40% | 20% |
| Weight for efficiency enhancers | 35% | 35-50% | 50% | 50% | 50% |
| Weight for innovation and sophistication factors | 5% | 5-10% | 10% | 10-30% | 30% |

**Source:** World Economic Forum (2016)

Innovation performance is essential for an economy to be strong, competitive and resource efficient on the world markets (Kaynak *et al.,* 2017). Innovation performance is highly dependent on the economic agents´ expectations regarding future economic situation on domestic and international markets (Tomaszewski and Swiadek, 2017).

According to Tidd *et al.* (2007), innovation contributes to achieving a competitive advantage in several aspects. The most important characteristics of innovations include: a strong relationship between market performance and new products. New products help maintain market shares and improve profitability. Growth is also by means of non-price factors such as design, quality,

individualization, etc. ability to substitute outdated products (shortening product lifecycles). Innovation of processes that lead to production time shortening and speed up new product development in comparison to competitors. Habánik *et al.* (2016) claimed that industrial clusters are important for the development of innovation activities and competitiveness of the companies. Unlike traditional industrial innovation clusters represent a system of close relationships not only between companies, their suppliers and customers, but also to institutions of knowledge, including research centers, universities, scientific research institutes, etc. As a generator of new knowledge and innovation, they provide a high level of competitiveness (Balcerzak and Pietrzak, 2016). Because, the research part of the study evaluates the results of countries in the $11^{th}$ and $12^{th}$ pillars of global competitiveness, a brief characteristic is included based on WEF.

The final pillar of competitiveness focuses on innovation. Innovation is particularly important for economies as they approach the frontiers of knowledge, and the possibility of generating more value by merely integrating and adapting exogenous technologies tends to disappear. In these economies, firms must design and develop cutting-edge products and processes to maintain a competitive edge and move toward even higher value-added activities which could also focus on solving social issues (Hadad, 2015). This progression requires an environment that is conducive to innovative activity and supported by both the public and the private sectors. In particular, it means sufficient investment in research and development, especially by the private sector; the presence of high-quality scientific research institutions that can generate the basic knowledge needed to build the new technologies; extensive collaboration in research and technological developments between universities and industry; and the protection of intellectual property

## 2.3. Empirical Review

Hausman *et al* (2012) and Puertas *et al* (2013) argued that logistics performances can significantly impact and bilateral trade relations between trading nations; therefore, the logistics performance is crucial for competitiveness.

Many research studies deal with measuring competitiveness from different perspectives (e.g. Simionescu *et al.,* 2017; Bánociová and Martinková, 2017; Simionescu, 2016; Calabrese *et al.,* 2013; Vigoda-Gadot *et al.,* 2008). A number of them assess competitiveness of countries in relation to selected aspects, where research confrontational and interpretational lines play an interesting role.

For instance, Odehnal *et al.* (2012) measure the competitiveness of Ukraine regions. For the purpose of their analyses, they chose several socioeconomic indicators from various industries. They used factor analysis and its results to arrive at the conclusion that out of four analyzed entry variables, one explained nearly half of the data source. Further, the following factors were analyzed: economic development factor, industry development factor, migration and employment rate factor, job market factor, and development factor. In their research, Önsel *et al.* (2008) examine the competitiveness of countries, while declaring the fact that the gross domestic product as an indicator has many limitations in terms of a correct grouping of countries via cluster analysis. Accordingly, 178 criteria were set within 11 sections, while three main indicators were measured: the so-called macroeconomic index, index of public institutions, and technological index. The results of their analysis are clusters of countries based on their level of competitiveness and a draft list of criteria for further analysis conducted by applying neural networks. The final country groups reflect the most commonly used indicator which is the gross domestic product.

Ülengin *et al.* (2002) assess competitiveness based on the evaluation of the World Competitiveness Index by the International Institute for Management Development. One of its components is gross domestic product. The research by Rozmahel *et al.* (2014) also has a significantly different research character when measuring competitiveness. Emphasis is put on the evaluation of the European Union member countries' infrastructure. The authors of the research primarily focus on EU's new members even though the analysis is performed using the data of all member countries, or potential future members in the given time period. The research implies that disparities between countries are gradually eliminated over time.

There are studies that investigated the differences between countries in terms of innovation performance and competitiveness. Şener and Sarıdoğan (2011) tried to investigate the effects of science-technology-innovation oriented global competitiveness strategies and transmission mechanism on the economic growth for the high-income OECD countries. Their results were that those countries have science-technology-innovation based economic policies and strategies have great superiority and sustainable competitive advantage; not only global competitiveness but also economic growth and development leading to wealth and welfare of the country. Cvetanovic *et al.* (2014) studied the relationship between the global innovation index and the global competitiveness index in Western Balkan countries and a group of six selected EU countries. Based on correlation and cluster analysis, they found no statistically significant effect (linear correlation) of the global innovation index (GII) and the global competitiveness index (GCI). On the

other hand, they proved the existence of a statistically significant impact of the GII on the GCI. Carayannis and Grigoroudis (2014), using multi objective mathematical programming and trend and gap analyses, found no significant gaps among innovation, productivity, and competitiveness, although several variations may be found for particular countries. Hudec and Prochádzková (2015) carried out a study in Visegrad countries and regions focusing on innovation performance and efficiency. Based on their research, the country factor does not hold much importance in that issue.

The movement of goods and services across borders has grown tremendously in recent years accounting for over 45% of the world GDP in 1990 - up from 25% in 1970. There was also a rapid shift to higher value-added activities: the export share of manufactures in developing countries tripled between 1970 and 1990 from 20 to 60% (World Bank, 1995: 75).

World trade expanded nearly thirty-fold in three decades since 1960. Manufactured goods as a percentage of total world exports increased from 55% in 1980 to 75% in 1990. The share of the newly industrialized countries (NICs) manufactured exports that can be classified as "high tech" soared from 2% in 1964 to 25% in 1985. Export accounted for 22% GDP in East and Southeast Asia, 11% for South Asia and 10% for Latin America (The Economist, 1995).

On the issue of cost of doing business, Hausman *et al.* (2012) argued that logistics performance between trading countries can be a significant determinant of the total landed cost. In a similar discussion, Shuai and Sun (2006) considered logistics cost to include monetary expression of all kinds in the course of product displacement, which can reflect the actual condition of logistics activities using money. Agreeing with Lean *et al* (2014) on the significance of ratios of logistics cost and value added by logistics industry on GDP. Likewise, Shuai and Sun (2006) added that a stable and efficient logistics network does not only affect cost but also promotes profits.

Airfreight and road compete regarding goods transported in small volumes and of high value. Concerning rail, the competition arises for large volumes and low-value goods. A competitive disadvantage which the road has compared to rail or maritime transportation is of transportation of very low-valued goods over long distances. The road mode also faces a time disadvantage related to airfreight regarding very high-value goods (Jonsson, 2008).

According to World Investment Report (2014), global investment trends show that developing economies have maintained a lead, sighting Africa's growth potential and flow of foreign direct

investment as an example. Further in this line of discussion, the World Economic Situation and Prospects (2015) attributes the growth recorded by Sub-Saharan Africa to investment in infrastructure among other factors. As a matter of fact, Shuai and Sun (2006) agrees with many other researchers who believe that development of the logistics industry will drive other industries and the entire economy.

Among the major risks posed to the Sub-Saharan African supply chain, Agility Emerging Market Logistics Index (2015) suggest that poor infrastructure result in lack of physical connectedness, increased transport cost and negatively impacts a country's overall trade development. According to Millar (2014), Africa's transport infrastructure lags well behind that of the rest of the world and doing business in Sub-Saharan Africa has remained challenging due largely to weak transport infrastructure. This situation has greatly impeded logistics services, thereby driving cost of doing business opportunities even higher. (Onyemejor, 2015)

Reviewing the works of previous authors, Lean *et al* (2014) identified the pitfalls of logistics to include undeveloped and aged infrastructure, government regulations and other regulatory restrictions, use of old handling equipment, lack of qualified logistics personnel to meet vibrant need in the economy as well as local protectionism that restrains efficient distribution. Hausman *et al* (2012) argued that these problems have a significant effect on trade competitiveness, pointing that they usually translate to delays in movement, customs, and ports, all having cost implications.

Acknowledging the seriousness of infrastructure deficit in Africa, Raba Land *et al* (2012) puts the shortfall at about $48 billion per annum, pointing that the shortcomings impede competitiveness and economic growth in the region. Confirming the empirical findings by Hummels and Schaur (2012), demonstrating how longer travel time negatively impacts trade, Raba Land *et al.* (2012), further stressed that infrastructure gaps and high transport cost hinders growth and poverty reduction in Sun-Saharan Africa.

Further in the discussion on impacts of delay on trade, Hummels and Schaur (2012) argued that a day in transit is ad valorem tariff of 0.6-2.3%. Investigating further, Hausman *et al* (2012) found by calculation, that a 1% reduction each in the distance and processing time measures would be associated with an increase of 1.39% and 0.373% respectively, in bilateral trade, and that a 1% reduction each in the total costs related to trade and in variability, would translate to an increase of 0.49% and 0.24% respectively, in bilateral trade.

A similar analysis by OECD's Ojala and Sertrans (2014) shows that a 1% cost reduction could increase world income by $40 billion and that exports potentially benefit at least as much as imports. This suggests that the efficiency of transport systems and industry profitability are closely related. The comparative efficiency of a country's logistics chain has a vital importance in attracting foreign investment and enhancing industrial competitiveness. Empirical studies show that trade and/or foreign direct investment flows more in the direction of a robust and efficient transportation systems (Onyemejor, 2015).

Regarding dwell time, Raballand *et al.* (2012) notes that ports in Sub-Saharan Africa averages more than two weeks, adding that it does not only affect efficiency but also worsen congestion situation with its cost implication on the economy. Akomolafe (2013) argue there is a proven link between the storage rate level and the dwell time of cargo as well as port congestion, suggesting that cheap storage might be an incentive for long dwell time. Raballand *et al.* (2012) also noted that the impact of dwell time on trade has in recent times been seen as a major hindrance to the development of low-income countries.

In the economic literature, a number of channels through which infrastructure can affect aggregate GDP levels and growth have been identified. A standard approach, following Aschauer (1989), incorporates infrastructure into the production function as a third input with capital and labour. Schauer's (1989) results sparked a discussion on the effects of public capital on output and productivity. His results, showing that the productivity of public investment can be much higher than that of private investment, caused strong controversy (being criticized from many methodological points of view, ranging from inappropriate estimation techniques to the specific characteristics of the period analyzed).

Infrastructure is treated separately, due to those features that distinguish it as an input and most of the specifications allow the use of physical stocks. Alternatively, infrastructure can be treated as a total factor productivity augmenting input: by lowering the costs of production (e.g. through the costs of transport and communication) it increases the technological index. Sturm *et al.* (1998) showed that an estimated Cobb-Douglas production function cannot distinguish between these two specifications.

Calderon and Severn (2002) estimate the effect of various types of physical infrastructure on growth and inequality for over 100 countries. The authors focus on Sub-Saharan Africa and experiment with both quantity and quality variables for infrastructure (electricity, road and

telecommunications). They include a number of control variables in their equation to account for education, trade, financial development, institutional quality etc. Using the system GMM of Arellano and Bover (1995) they find strong positive effects of infrastructure on growth. Esfahani and Ramirez (2002) develop and estimate a structural model of infrastructure and growth for 75 countries. The authors find benefits from infrastructure investment and performance in infrastructure sectors but show that achieving better outcomes (in terms of growth) requires institutional and organizational improvements

The Global Enabling Trade Report (2014) suggested that improving key components can result in an increase of up to 4.7% in GDP and 14.5% in global trade respectively. This supports the argument by Arvis *et al* (2014) that better logistics spur growth, competitiveness and investment. Agility Emerging Market Logistics Index (2015) also agree with this argument by attributing Columbia's market size, attractiveness and connectedness to her on-going $25 billion massive expenditure in transport related infrastructure.

Zhu (2006) and Shuai and Sun (2006) both agree that without effective support of a logistical system, competitiveness will greatly be affected as service efficiency and cost of logistics systems, to a large extent, determine the growth while greatly affecting attainment and sustenance of a competitive strength. This competitiveness usually implies strong advantage based on enterprise, resources, and infrastructure, whereby supply to place of demand is made to meet customer need at most economical expenses characterized by reduced trade and production costs.

Managing maritime logistics performances of time, cost and reliability adequately, requires that same be arranged under maritime logistics and supply chain (Hausman *et al,* 2012). Song and Panayides (2012) pointed out that such represents a convergence of shipping and ports and necessitating integration of efforts. Christopher (2005) also noted that recognition of the impact logistics has helped organizations achieve competitive advantage accruable from the various ways it increases efficiency and productivity, adding that it contributes significantly to cost saving.

A great deal of research has been conducted in subjects relating to trade and international competitiveness, but the majority seems to focus only on either infrastructure or trade development factors. Some others dwell on competitive advantage of nations with emphasis on products and pricing mix of marketing with insufficient attention to place utility which can impact the former.

Another significant group either focuses on either performance or process of competition neglecting the process of managing and sustaining competitiveness.

For example, Puertas, *et.al* (2013) seemed to focus only on World Bank's LPI. On the other hand, Hausman, *et.al* (2012) exhaustively discussed the impacts of trade-related transactions (time, cost and variability in time) on trade drawing on data set developed by the World Bank. However, their analysis was heavy on quantitative metrics but did not capture judgmental opinion. Lean, *et. al* (2014) came close to a comprehensive approach to examining the relationship between logistics development and economic growth but focused mainly on the role of infrastructure.

An empirical analysis by Raballand (2003) measures the impact of being landlocked on trade using four measures of being landlocked: the first estimation is obtained by using a dummy variable, the second estimates the shortest distance between a landlocked country and the nearest main port facility, the third one shows the number of borders of coastal countries, and the fourth considers the number of national borders. The study finds that being landlocked will decrease trade by almost 80% when it is measured by a dummy variable. They demonstrate that effect is closely linked to geographical location distance from major markets, main trade flows, and main hub (airports or ports) facilities measured by additional transport cost and the number of border crossing. Arvis *et al.* (2010) further estimate that landlocked economies face a cost penalty ranging from 8 to 250 percent and a time penalty ranging from 9 to 130 percent for using the coastal neighbor as a transit corridor. Radelet and Sachs (1998) also study the transport costs issues using CIF and FOB data from IMF for 97 developing countries, 17 of which are landlocked and estimate that transport

This assessment has been attempt to bridge these gaps by linking the fright transport service and international trade with its implication for global competitiveness through improved mobility performance, which has not only become the key of raising enterprise competitiveness, but it has also become the competitive advantage with which to journey for world market.

### 2.3.1 Conceptual Framework

When policymakers talk about improving competitiveness as a goal, they are usually seeking to promote the expansion of businesses within their geographic region. Freight transportation improvements can serve this goal through several avenues. Improvements in freight transportation can reduce freight transit times, improve the reliability of freight shipments, and reduce the cost of freight transportation. Reduced transit times can allow businesses to access suppliers in a larger

market region or sell their products into a larger market area. Improvements in the reliability of transit times can allow businesses to reduce inventory levels and rely more on just-in-time shipments, reducing their total logistics cost of production. Freight transportation improvements that enable businesses to produce products with lower total input costs will allow them to achieve a relative advantage against other firms who have higher costs. Reducing the total logistics costs associated with obtaining supplies and moving finished goods to market improves productivity by allowing businesses to produce more with fewer resources. Access to low-cost suppliers can also reduce input costs. Businesses may either pass these savings on to consumers or retain them as profits, or some combination of these. If the savings are passed on to consumers through reduced prices, this may allow businesses to increase demand for their products, capture market share and expand production (Laurence O, 2015). Freight transportation improvements thus enable competitiveness by improving productivity. Increased competitiveness creates opportunities for business growth and expansion. Furthermore, other components such as once country GDP, distance and being land locked or not can also affect the bilateral trade of the country. If the countries trade well structured, both countries can be competent and beneficial to each other. The logistic performance has an influential effect on the bilateral trade. Finally, their overall effect tends the country to being competent. The following pandemic indicators show how fright and other market competitiveness associated with the international trade and make globally competent.

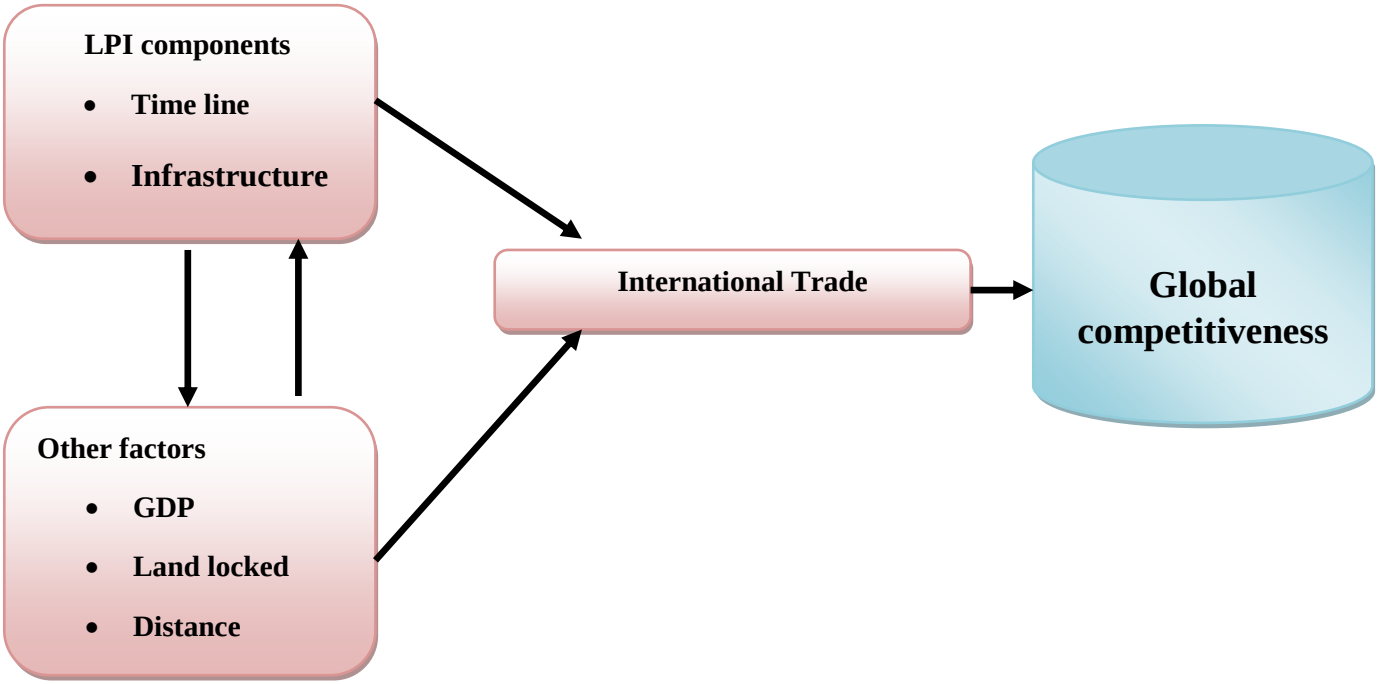



**Figure 2.1:** Conceptual frame work

# CHAPTER THREE

## Research Methodology

### 3.1. Introduction

This chapter describes the research design employed in this research. To obtain reliable research findings, a research must be well designed with clear method for collecting, editing, organizing, summarizing and analyzing data. The chapter describes the research design, data type and source, Research Design and Research approach, data collection method, data Selection Procedure and Techniques finally, measurements and analysis is constituted.

### 3.2. The Research Design

The research design is the structure of the research. It can be regarded as an arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance with the research purpose (Kombo and Tromp, 2006). Descriptive studies are used to acquire information regarding the present status of the phenomena and to describe what exists with regards to variables in a scenario. Therefore, in order to assess the fright transport service and international trade with its implications for global competitiveness descriptive research design is applied; because the researcher have been collect published data from the international organizations reports in relation to the factors that influence in a freight transportation services and international trade with its implications for global competitiveness, with an aim to determine if these factors influence the international trade and global competitiveness for the logistics organization.

Moreover, it has been used longitudinal in design since it is a series of data points indexed in time order. Most commonly, a time series is a sequence taken at successive equally spaced points in time.

In addition, research strategies help researchers to provide data that can answer the research questions or achieve the research objectives. In fact, there are many types of research strategies, depending on the types of data that the researcher wants to collect and analyze, such as experiment, survey, case study, action research and grounded theory. However, this study had been employed case study because there is a wide scope of competencies to be evaluated within a serious of time in this research. These determines a long interaction time, which in turns to aimed at attracting a wider sample group with a given time interval.

## 3.3 Research approach

In order to achieve the objectives of this study and thereby to give answer for its problems, quantitative research approach has been used by the researcher. There were compelling reasons why the researcher opts to use quantitative method. For instance, the adoption of positivist paradigm entails that measurement remains an essential element since its basic assumption in social and economic phenomenon can be measured. So, this helps to deeper insights on the issue, to significantly strengthen the analyses and thus enhance confidence in the conclusions.

## 3.4 Data source

Data collection refers to gathering specific information aimed at improving or refuting some facts (Kombo and Tromp, 2006). The researcher has been used secondary sources of data for gathering information. Since it has to evaluate the assessment of fright transport service and international trade with its implications for global competitiveness, the type of data for the study is more of a quantitative time dependent; so that it could be measured and ranked. The coverage of data for this particular study encompassed from 2007-2018. That has the competitive measure of logistic and trade has been done within two years globally. Therefore, 6 consecutive two years interval data would be collected regardless of the countries those do not have all the data within the indicated duration. Thus, the study purely used secondary data.

## 3.5. Data collection

In order to assess the fright transport service and international trade with its implications for global competitiveness, the LPI and GCI data, GDP, Infrastructure, distance Timelines data have been collected from the World Bank report, from the official Websites of the world bank and associated organizations. However, countries of unfiled or missing data have not considered.

Additional information's also collected from different sources includes the international organizations policy and standards documents and international organizations annual reports (World Bank report, WTO, OECD, and UNCTAD), organizations internal reports, publications, newspapers, journals, documents from respective government offices etc.

## 3.6 Selection Procedure and Techniques

Reliable logistics is indispensable to integrate global value chains and reap the benefit of trade opportunities for growth and poverty reduction. The ability to connect to the global logistics web depends on a country's infrastructure, service markets, and trade processes. Government and the private sector in many developing countries should improve these areas or face the large and growing costs of exclusion. According to recent information from the World Bank report, there are 160 countries worldwide those recorded their LPI and GCI within two years interval, out of which, the top first ten, lower ten countries has been selected purposively to evaluate their competitiveness. Because, as stated earlier, the objective of this study has to assess the fright transport service and international trade with its implications for global competitiveness for the year 2007-2018 by using the two indexing systems. However, the countries those have missed or unfiled data are not considered in the study.

## 3.7 Data analysis

After data were collected, data processing has been carried out. The raw data converted into suitable form for analysis and interpretation. This has achieved through sequences of activities including editing, coding, entry, and tabulation. The objective has to check the completeness, internal consistency and appropriateness of the data to each of the variables. Statistical analysis has been carried out by using Excel and Statistical Package for Social Science Software (v.24).

Descriptive statistic such as mean, percentages and frequency distributions, have been employed to give a deeper analysis of data. Moreover, GCI and LPI indexes have been used to evaluate the trade and logistic services and their implication on the global competitiveness. In addition, gravity model have been applied to indicate the relationship between trade and logistic service implication on the global competitiveness.

To measure the fright transport service and international trade implications for global competitiveness, Performance Indicators (output and service), and Comparative analysis has to be used. It is a standard analysis model for measuring competitiveness. For instance, the common indexing system those used for logistic and trade competitiveness are LPI and GCI.

The logistics performance (LPI) is the weighted average of the country scores on the six key dimensions:

1. Efficiency of the clearance process (i.e.; speed, simplicity and predictability of formalities) by border control agencies, including customs.
2. Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology);
3. Ease of arranging competitively priced shipments;
4. Competence and quality of logistics services (e.g., transport operators, customs brokers);
5. Ability to track and trace consignments;
6. Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

Later, those six LPI indicators can be mapped onto two main categories: -

1. Areas for policy regulation, indicating main inputs to the supply chain (customs, infrastructure, and services); and

2. Supply chain performance outcomes (corresponding to LPI indicators of time, cost, and reliability - timeliness, international shipments, and tracking and tracing).

Each of the components had different attritions. The level of international competitiveness using that attrition was measuring through a psychometric 5-point Likert scale inquires. The five categories of response were: 1, very dissatisfied; 2, dissatisfied; 3, neutral; 4, satisfied; and 5, very satisfied. This scale has been used to measure the reliability, cost, frequency, and time factors how to determine the provisions of freight transport service and international trade implications with its global competitiveness. The use of a 5-points Likert scale allows for the balanced collection of respondent opinion through an equal number of positive and negative categories (Bureau of Transport Statistics, 2011).

Based on a worldwide survey of global freight forwarders and express carriers, the LPI is a benchmarking tool developed by the World Bank that measures performance along the logistics supply chain within a country. Allowing for comparisons across 160 countries, the index can help countries identify challenges and opportunities and improve their logistics performance. The World Bank conducts the survey every two years.

Likewise, the trade competitiveness evaluated by using GCI. The indexes measure the relative capacity of countries to provide their citizens opportunities to prosper. These indexes also provide a benchmark to measure the bureaucracy, management of resources and regulation institutions of countries. GCIs are used by businesses to decide which countries are more receptive to investment and more likely to provide a good return. The most used index is the Global Competitiveness Index, GCI, which is calculated by the World Economic Forum as a basis for its Global Competitiveness Report. It is calculated by using twelve reliable pillars those seated with 5-points Likert scale attritions.

In other direction, the gravity model to examine international trade flow is also analogous to Newton's law, relating the gravity between two objects to their masses and the distance between them. According to the gravity approach, bilateral trade between two regions (countries) is directly related to their incomes (GDP, GNP) and inversely related to the distance between them. The antecedents for using the gravity approach to model international trade flow date back to Tinbergen (1962), Poyhonen (1963) and Linnemann (1966). Linnemann added more variables and went further toward a theoretical justification. He pointed out that, when considering the theoretical aspects of a gravity model for trade, there are three main factors to be considered:

1) The total potential supply (or exports) of a country to the world market;
2) The total potential demand (or imports) of a country to the world market;
3) Those factors that create a resistance to trade and thus affect the degree of trade intensity.

These include ordinarily tariff barriers and transportation costs. The first and second factors are expected to be equal to one another if one disregards the international flow of capital, services or land transfers. The advantages of using gravity approach for modeling transition processes in foreign trade are the ability of gravity models to explain international trade pattern under the conditions of comparatively little amount of data and validity of theoretical background of the model to the economies in transition.

## 3.8. Model Specifications

$$\ln(\delta_{ij}) = \alpha_i + \beta_1 \ln(GDP)_j + \tau_1 \ln(Distance_{ij}) + \tau_2 Landlocked_i + \tau_3 \ln(Time_{ij}) + \tau_4 \ln(Infrastructor) + \upsilon_{ij}$$

Where:

$\alpha_i$ : Constant term

$\delta_{ij}$ : is measured as exports from country *i* to country *j*

$\beta_1 GDP_j$ *:* Gross Domestic products of country *j*.

$\tau_1$ : can be interpreted as the elasticity of trade with respect to distance, Distance is a bilateral variable.

$Landlocked_i$ *:* Dummy variable

$Time_{ij}$ : The time (days) to accomplish exports of country *i* and imports of country *j* process or the time (days) where exports of country *i* and imports of country *j* to complete route.

*Infrastructor* : The amount of dollar to charge goods from export country *i* to import country *j*.

$\upsilon_{ij}$ : Error terms

# CHAPTER FOUR

## Data Analysis, Presentation and Interpretation of Findings

## 4.1 Introduction

In this chapter data collected was organized into a systematic format to enable analysis. The researcher analyzed the data in line with the four objectives of the study which included examining the factors which influenced freight transportation service and international trade with its implications for global competitiveness. In some cases, the researcher has been devoted to providing tools, by bringing evidence and that address, international as well as the country-specific supply chain constraints more deeply.

### 4.2. The extent of freight transport service and its implications on the international trade with the consideration of top-ten upper and lower countries.

The World Bank's Logistics Performance Index (LPI) provides the most comprehensive international comparison tool to measure the trade and transport facilitation friendliness of countries. Understanding and decomposing the components of trade and logistics performance can help countries improve freight transport efficiency and identify where international cooperation could help overcome barriers.

The logistics sector is now recognized as one of the core pillars of economic development. It allows for comparisons of the logistics performance of both the international and domestic trade across 160 countries. The figure 4.1, below illustrated the first top 10 highest scorer countries. According to the 2007 LPI report Singapore had been the first best performing country, with a score of 4.19. The differing pace of progress is also seen in the ratings on the quality of domestic trade and transport infrastructure. For instance, in terms of the domestic logistic cost Singapore were found in the least rank, 113. Rather Japan had a cost efficient, low logistic transport cost, compared all over the top 10 LPI scorers. This implies that Singapore scored first due to it scores highest grade with the overall quality domains consideration.

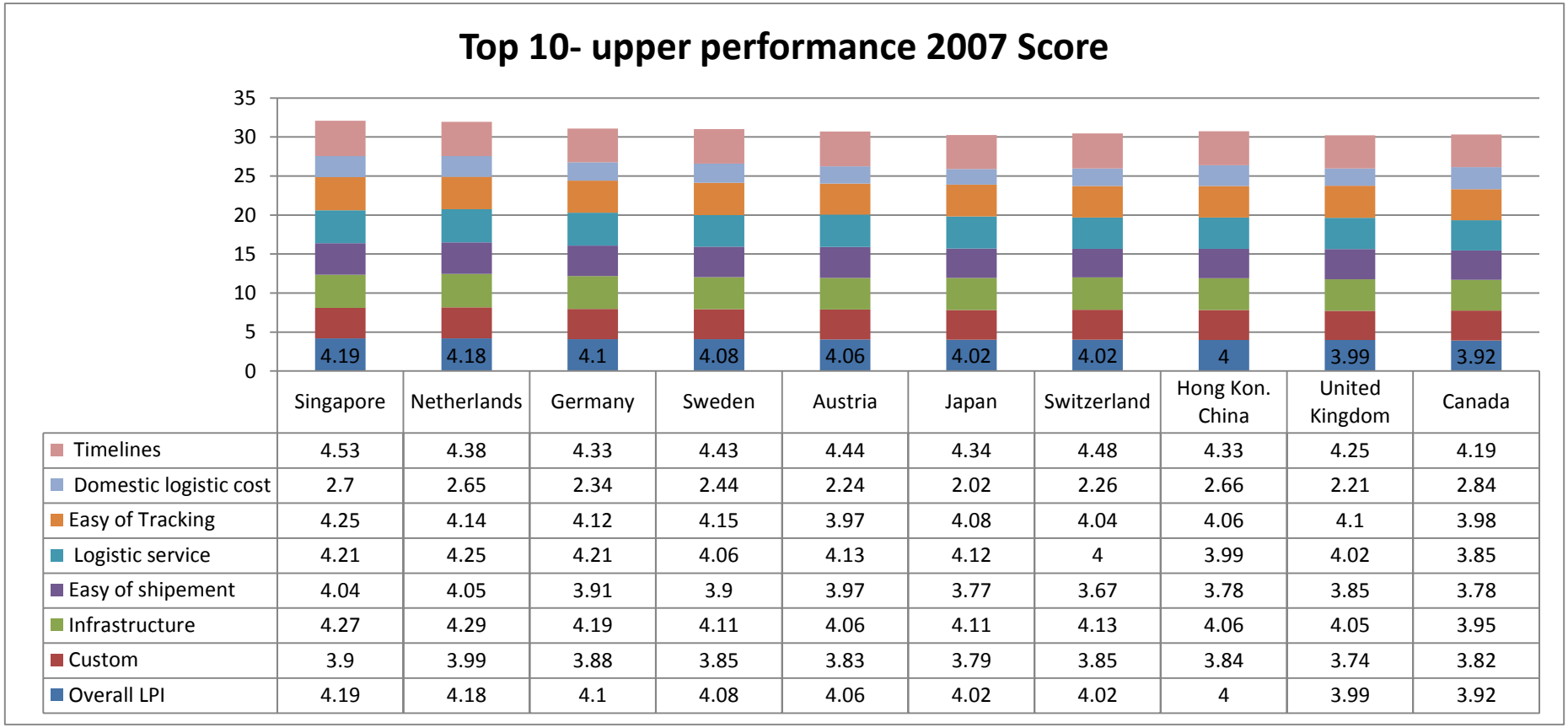
As the result also illustrated the custom processing, Netherlands were found in the 2st top position followed by Singapore, whereas, it scores highest with the consideration of customs, infrastructure, and ease of shipment. In contrast, United Kingdom and Japan were lowers countries compared with all the other top -10 LPI scorers. Even if the specified countries average LPI scores were rapidly increased, their customs status varied once with the other. This implies that the countries taxation system was not instable during that period.

Regarding to infrastructure Netherland score the top place as compared to other countries. In fact, almost all of the listed countries took the first top 10 positions, except Canada and United Kingdom. This indicated that those countries had aiming to improve trade supporting infrastructure in their logistics services. This explanation may still be largely valid in the majority of ranked countries.

The shipment quality of those indicated countries was also found in the beast status. Most of the countries rank from 1 to10, except Switzerland. This implies that the logistic performance of the countries was also supported with quality of shipment. This finding also illustrates that in supply chain efficiency and reliability the logistics gap of the top scorers' countries were not that much real and persistent.

Moreover, reliability and timeliness are key considerations for logistics in global value chains. Indeed, the ability to ensure on time delivery and clearance as reflected in the figure below the majority of the top 10 LPI performers' countries had a better punctuality. Singapore took the first score; whereas, Canada was found in the bottom next to United Kingdom. This also indicated that the supply chain of clearance and delivery of those countries were found in a better condition.

FIG 4.1: Top 10 upper performance Score --2007




| | Singapore | Netherlands | Germany | Sweden | Austria | Japan | Switzerland | Hong Kon. China | United Kingdom | Canada |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.53 | 4.38 | 4.33 | 4.43 | 4.44 | 4.34 | 4.48 | 4.33 | 4.25 | 4.19 |
| Domestic logistic cost | 2.7 | 2.65 | 2.34 | 2.44 | 2.24 | 2.02 | 2.26 | 2.66 | 2.21 | 2.84 |
| Easy of Tracking | 4.25 | 4.14 | 4.12 | 4.15 | 3.97 | 4.08 | 4.04 | 4.06 | 4.1 | 3.98 |
| Logistic service | 4.21 | 4.25 | 4.21 | 4.06 | 4.13 | 4.12 | 4 | 3.99 | 4.02 | 3.85 |
| Easy of shipement | 4.04 | 4.05 | 3.91 | 3.9 | 3.97 | 3.77 | 3.67 | 3.78 | 3.85 | 3.78 |
| Infrastructure | 4.27 | 4.29 | 4.19 | 4.11 | 4.06 | 4.11 | 4.13 | 4.06 | 4.05 | 3.95 |
| Custom | 3.9 | 3.99 | 3.88 | 3.85 | 3.83 | 3.79 | 3.85 | 3.84 | 3.74 | 3.82 |
| Overall LPI | 4.19 | 4.18 | 4.1 | 4.08 | 4.06 | 4.02 | 4.02 | 4 | 3.99 | 3.92 |

Source; world bank 2007.

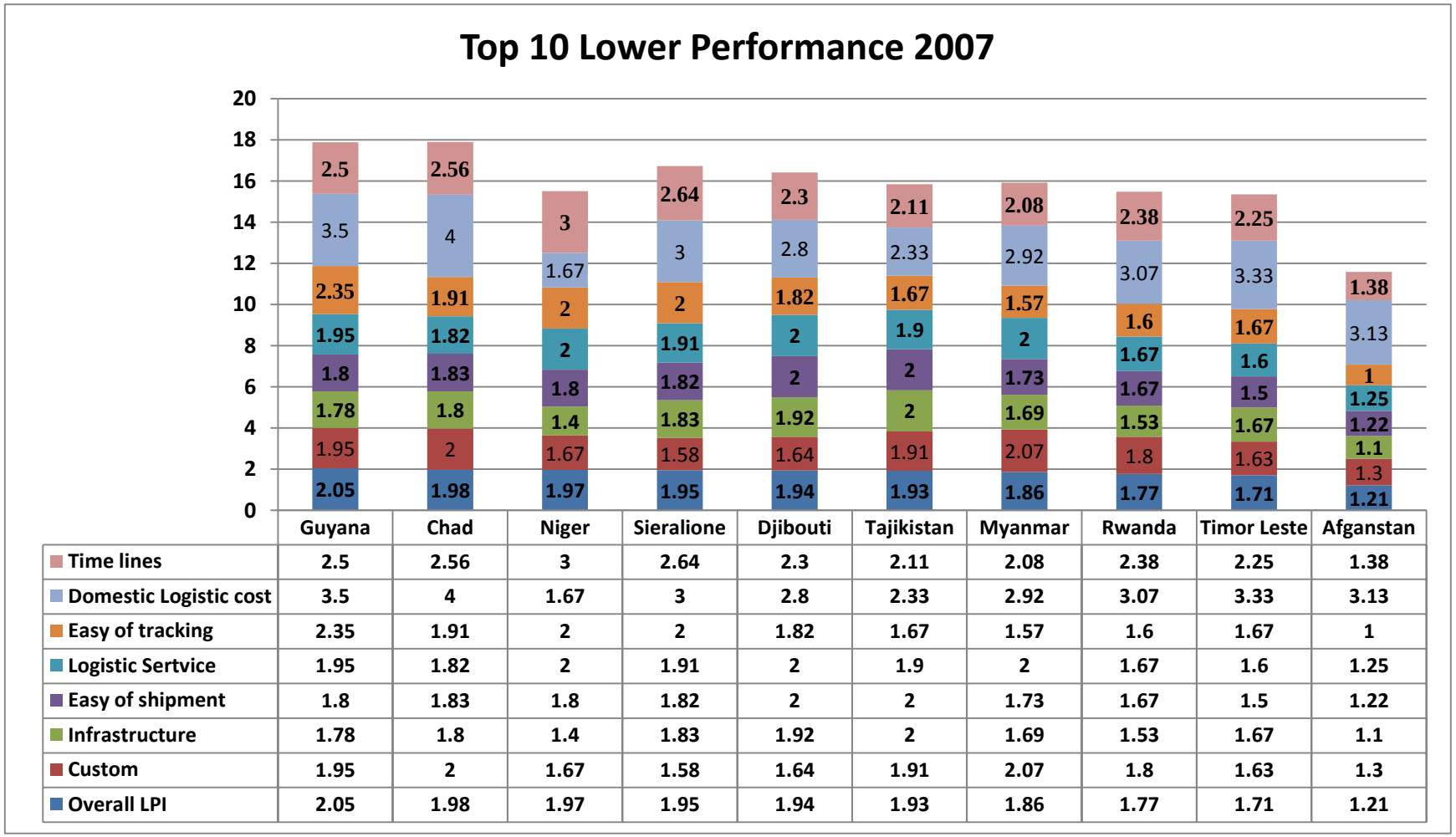
The figure below is also exemplified the top 10- lower scorer performing countries. According to the 2007 LPI report Afghanistan has the worst logistics performing country, with a score of 1.21. The distributions of data score and progress is also seen difference in the ratings on the quality of domestic logistic costs and transport infrastructure. For example, in terms of the domestic logistic cost Afghanistan were found in place of $40^{th}$, and followed by, Timor-Leste. However, Chad attain the $1^{st}$ domestic score rank within the entire considered countries within the indicated period. Rather, Niger had a better to lowering domestic logistic cost as compared to the top-10 lower performing countries. Likewise, Tajikistan had a little better performance regarding to transport infrastructure, as compared to top-10 lower performing countries.

In terms of taxation system, Myanmar had a better customs process than the other lowest bottom 10 scorers' countries. In other dimensions, Tajikistan had a slight difference international shipment, even if, the countries categorized in to the top 10-lowest logistic performers countries.
Regarding the logistics service quality and competence, Niger, Djibouti and Myanmar were performing the same score and slightly the higher position, as compared to the other top-10 lower performing countries. In fact, almost all of the listed countries recorded very lowest performance in the indicated issues.

Furthermore, tracking and tracing is key driving factors that determining for firms involved in global logistic chains. Tracking and tracing is the ability to track and trace consignments during the concern period. The lower performing top 10 countries had taken a worst position. For instance Guyana score better rank compared the rest of the other competent; whereas, Afghanistan and Myanmar registered a very lowest score, very worst.

Likewise, reliability and timeliness are vital considerations for firms involved in international supplies chains. Timeliness is the frequency with which shipments reach consignees within scheduled or expected delivery times. Even though, this category was at the lower edged and low income-economy, Niger had took the $1^{st}$ position among lower top10-performing categories, not only from the lower edge countries but also Niger attain a best score rank-$85^{th}$ , among 150 countries, in the year 2007.

Figure 4 2: Top 10 lower performance Score --2007




| | Guyana | Chad | Niger | Sieralione | Djibouti | Tajikistan | Myanmar | Rwanda | Timor Leste | Afganstan |
|---|---|---|---|---|---|---|---|---|---|---|
| Time lines | 2.5 | 2.56 | 3 | 2.64 | 2.3 | 2.11 | 2.08 | 2.38 | 2.25 | 1.38 |
| Domestic Logistic cost | 3.5 | 4 | 1.67 | 3 | 2.8 | 2.33 | 2.92 | 3.07 | 3.33 | 3.13 |
| Easy of tracking | 2.35 | 1.91 | 2 | 2 | 1.82 | 1.67 | 1.57 | 1.6 | 1.67 | 1 |
| Logistic Sertvice | 1.95 | 1.82 | 2 | 1.91 | 2 | 1.9 | 2 | 1.67 | 1.6 | 1.25 |
| Easy of shipment | 1.8 | 1.83 | 1.8 | 1.82 | 2 | 2 | 1.73 | 1.67 | 1.5 | 1.22 |
| Infrastructure | 1.78 | 1.8 | 1.4 | 1.83 | 1.92 | 2 | 1.69 | 1.53 | 1.67 | 1.1 |
| Custom | 1.95 | 2 | 1.67 | 1.58 | 1.64 | 1.91 | 2.07 | 1.8 | 1.63 | 1.3 |
| Overall LPI | 2.05 | 1.98 | 1.97 | 1.95 | 1.94 | 1.93 | 1.86 | 1.77 | 1.71 | 1.21 |

Souce; world bank 2007.

The World Bank's Logistics Performance Index (LPI) provides the most comprehensive international comparison tool to measure the trade and transport facilitation friendliness of countries, based on these provisions. Germany has the first best performing country among 155 countries with a score of 4.11. Aiming to improve logistics performance has become an important development policy objective and tools to Germanys.

**The customs clearance efficiency** and service level not only affect the trade efficiency, but also creates great impact on the investment, employment and even regional economic development (Yaqin and Yuming, 2010)., The 1st best performing country on this component was Luxembourg, followed by Singapore and Germany. However, the worst performing country, Switzerland only among top-10 economies.

**Regarding Quality of infrastructure;-** and developing modern trade processes. The physical movement of goods now entails the efficient and timely exchange of information. Among top-10 upper income countries of the LPI's competition, Germany had took the 1st best performance across 155 competitors' country, followed by Netherlands and Norway respectively. These imply that, high -income economies' have been hard working, concerning of quality infrastructure building.

**International shipment** it is the critical measure area that needs concrete improvement, because of these logistics service providers are fighting for the national and region's economic grows continuously. Logistics service providers have become key players and to improve logistics and supply chain. Considering to these phenomenon, Singapore had acquired the 1st rank among 155 countries from these categories, followed by Sweden and Luxembourg. However the worst performing countries from the categories, Belgium

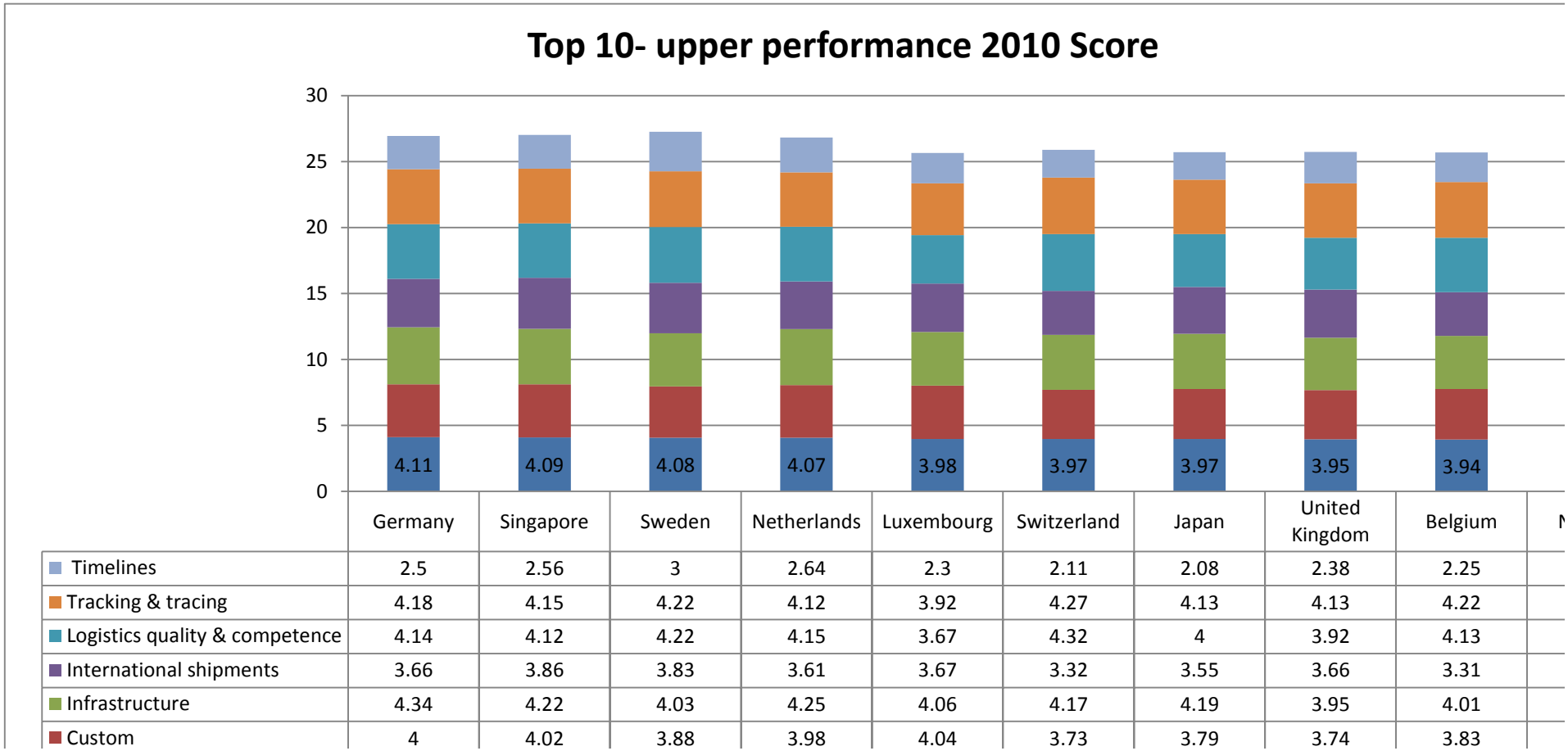
**Logistics quality and competence**;- are a critical and significant factor to evaluate the overall level of competence and quality of logistics services, regarding to this dimension, Switzerland had took the 1st rank among the top 10-upper performing countries, with its score of 4.37. Followed by Sweden and Netherlands respectively.

**Tracking and Traceability;-** has the result of the activity of the logistics sector as a whole, since all parties in the goods' supply chain are involved in this component and it can be regarded as one of the priority areas for future investments in trade logistics. Regarding Tracking & tracing performance**,** Switzerland had took the 1st rank, followed by Belgium and Sweden 2nd , Germany 3rd rank among the Top 10- upper performance countries.

**Timeliness of shipments in reaching destination**

Timeliness of shipments is the schedule of in reaching destination measures, how reliably shipments meet the promised delivery times. The reliability of the supply chains is generally measured by the timeliness of the delivery day. Concerning timeliness of shipments performance. Luxembourg had attained the 1st rank and followed by Poland and Germany across the top 10 performing countries, even if the comparison between top 10 performing countries and also, among of 155 countries Rather Poland had took the 2nd rank and highest score among 155 countries, but not in the categories of top- 10 categories.

Figure 4.3 : Top 10 upper performance Score –2010




| | Germany | Singapore | Sweden | Netherlands | Luxembourg | Switzerland | Japan | United Kingdom | Belgium |
|---|---|---|---|---|---|---|---|---|---|
| Timelines | 2.5 | 2.56 | 3 | 2.64 | 2.3 | 2.11 | 2.08 | 2.38 | 2.25 |
| Tracking & tracing | 4.18 | 4.15 | 4.22 | 4.12 | 3.92 | 4.27 | 4.13 | 4.13 | 4.22 |
| Logistics quality & competence | 4.14 | 4.12 | 4.22 | 4.15 | 3.67 | 4.32 | 4 | 3.92 | 4.13 |
| International shipments | 3.66 | 3.86 | 3.83 | 3.61 | 3.67 | 3.32 | 3.55 | 3.66 | 3.31 |
| Infrastructure | 4.34 | 4.22 | 4.03 | 4.25 | 4.06 | 4.17 | 4.19 | 3.95 | 4.01 |
| Custom | 4 | 4.02 | 3.88 | 3.98 | 4.04 | 3.73 | 3.79 | 3.74 | 3.83 |

Source: world bank reports 2010.

The World Bank's Logistics Performance Index (LPI) 2010 is a comprehensive index published reports in 2010 of logistics performance result for 155 countries, that encompass lower-top-10 performing (low-income economy) country. The LPI covers the entire supply chain and based on a valuable tool in comparing performance across countries and identifying key challenges within countries. Aiming to Improving logistics performance has become an important development policy objective, the concerns of customs, trade-related infrastructure, International shipments, Logistics quality & competence, Tracking & tracing, and Timeliness are all critical to whether countries can trade goods and services on time and at low cost, Since lower income countries do benefit significantly from improved logistic cost and service.

**The efficiency of customs and border clearance**

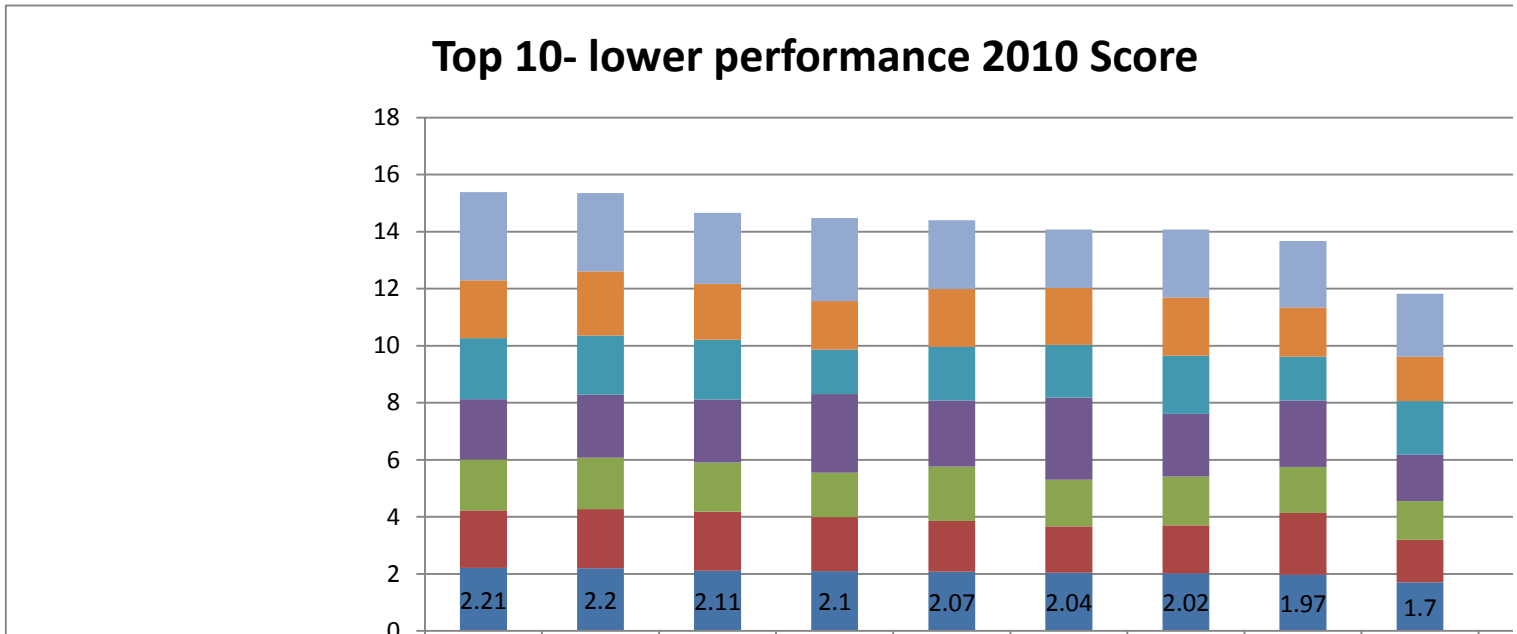
The efficiency of customs and border clearance measures this procedure in terms of speed, simplicity and predictability when dealing with customs and other border agencies. As customs and border clearance is one of the LPI components evaluation tool and dimension for the year 2010. The figure- 4 below illustrated on a comparative basis, Sierra Leone had took $110^{th-}$ crossways 155 countries, Somewhat Sierra Leone had, the preferable and leading countries among top 10 -lower-income economies categories, even if, Sierra Leone performs better customs clearance procedures than others rest countries.

**International shipment**

Regarding to the International shipment its' the critical measure area that needs concrete improvement, because of both domestic and international factors are measured by LPI tools. Domestically, there are many attempts applied by both government and private stakeholders, to reduce logistics cost as well as facilitating logistics activities. Logistics service providers have become key players and to improve logistics and supply chain. To realizing the phenomena, (the figuer-4 below illustrated). Rwanda had performed the $67^{th}$ rank among 155 countries, followed by Guinea-Bissau and Cuba, even if, both Rwanda and Guinea-Bissau are at the lower-income economics as well as categorized to the top-10 lower performing countries, they got the best performing rank in International shipments.

Moreover, On the case of Logistic performance Index (I.e. Logistics quality & competence, Tracking & tracing, Timeliness), as illustrated on the figure -4, below, the logistic performance report had been poor for all lower top-10 performing groups amongst 155 countries. This implies that, the top-10 lower performing country's economic un-efficiency, those countries obliged to stays and process poor Logistics quality & competence, Tracking & tracing, Timeliness. These leads to high logistic service cost and fragmented economy.

Figure 4.4: Top 10 Lower performance Score -2010




| | Sudan | Nepal | Iraq | Guinea-Bissau | Cuba | Rwanda | Namibia | Sierra Leone | Eritrea | Sc |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 3.09 | 2.74 | 2.49 | 2.91 | 2.41 | 2.05 | 2.38 | 2.33 | 2.21 | |
| Tracking & tracing | 2.02 | 2.26 | 1.96 | 1.71 | 2.03 | 1.99 | 2.04 | 1.73 | 1.55 | |
| Logistics quality & competence | 2.15 | 2.07 | 2.1 | 1.56 | 1.88 | 1.85 | 2.04 | 1.53 | 1.88 | |
| International shipments | 2.11 | 2.21 | 2.2 | 2.75 | 2.32 | 2.88 | 2.2 | 2.33 | 1.63 | |
| Infrastructure | 1.78 | 1.8 | 1.73 | 1.56 | 1.9 | 1.63 | 1.71 | 1.61 | 1.35 | |
| Custom | 2.02 | 2.07 | 2.07 | 1.89 | 1.79 | 1.63 | 1.68 | 2.17 | 1.5 | |

**Source: world bank 2010 report.**

The efficiency of a country's supply chain depends on specific features of domestic economy. And finally, the better logistics performance and trade simplification are strongly connected to trade expansion, export diversification, attractiveness to foreign direct investment, and economic growth. The figure 5, below illustrated LPI data for the 3rd round based on World Bank report. According to the 2012 LPI report, Singapore had the first best performing country, as an overall score of 4.13. Singapore replaces Germany and increases by one rank, as compared to the previous year's 2010.

The countries' LPI ensures the improvement of freight transport efficiency and identified options for better international cooperation. Subsequently, the element which helps to evaluate the logistic performance results in terms, customs processing among country. Singapore has found in the 1st top position, followed by Hong K. S. China and Finland. However, japan and United States' are worst compared across top-10 upper performance LPI economies. Even if the indicated countries average LPI scores were rapidly increased their customs status varied once with the other. This indicated that the performance of Singapore in this respect is best at a score of 4.13 and ranking 1st among 150 countries, these implies that Asian countries have been, exerting high efficiency regarding to LPI. Performance.

**customs clearance efficiency**

The customs clearance efficiency and service level not only affect the trade efficiency, but also creates great impact on the investment, employment and even regional economic development (Yaqin and Yuming, 2010). Customs department operates in an increasingly complex and rapidly changing environment characterized by new trade patterns, demands for better trade facilitation and efficiencies, while at the same time dealing with growing safety and security concerns and new risks. Considering to the top-10 upper performing countries competitions, the 1st best performing country on this component was Singapore, followed by Finland and Hong K. S. China. However, the worst performing country, United States only among top-10 economies.

**Infrastructure**

Regarding to the logistic performance evaluation results of Infrastructure among the countries rank. Germany had found in the 1st-top best position followed by Singapore and Netherlands as well as Finland. However, on the situation of Infrastructure factors' Denmark and United Kingdom were at lower position as compared to top-10 upper performance LPI scorers. Even the indicated countries average LPI scores were rapidly increased their customs status varied once with the other. This indicated that, the performance results. Germany in this respect had took 1st best score of 4.26 and ranking 1st among 150 countries, or Germany had best infrastructure facilitations.

**International shipments**

Correspondingly Indicators for measuring the national logistics performance are vital for efficient policy and operational regulations. These basic element which helps to associate the logistic performance level of International shipments of the country report provides. Hong K. S. China was found in the top position followed to Singapore and Netherlands. However, Japan and United States' are lower rank for the factors of International shipments as compared to top 10 upper performance LPI scorers.

**Logistics quality and competence**

Moreover, the LPI's component for measuring the quality of logistics services and operations evaluates the general logistics level of a particular country. The basic indicator which helps to grading the logistic performance level of Logistics quality and competence between the countries. Finland and Denmark has been found on the 1st- top position, followed by Hong.K. However, United States and United Kingdom are lower rank to the factors of Logistics quality & competence as compared only with top 10 upper performance LPI scorers.

**Tracking and tracing**

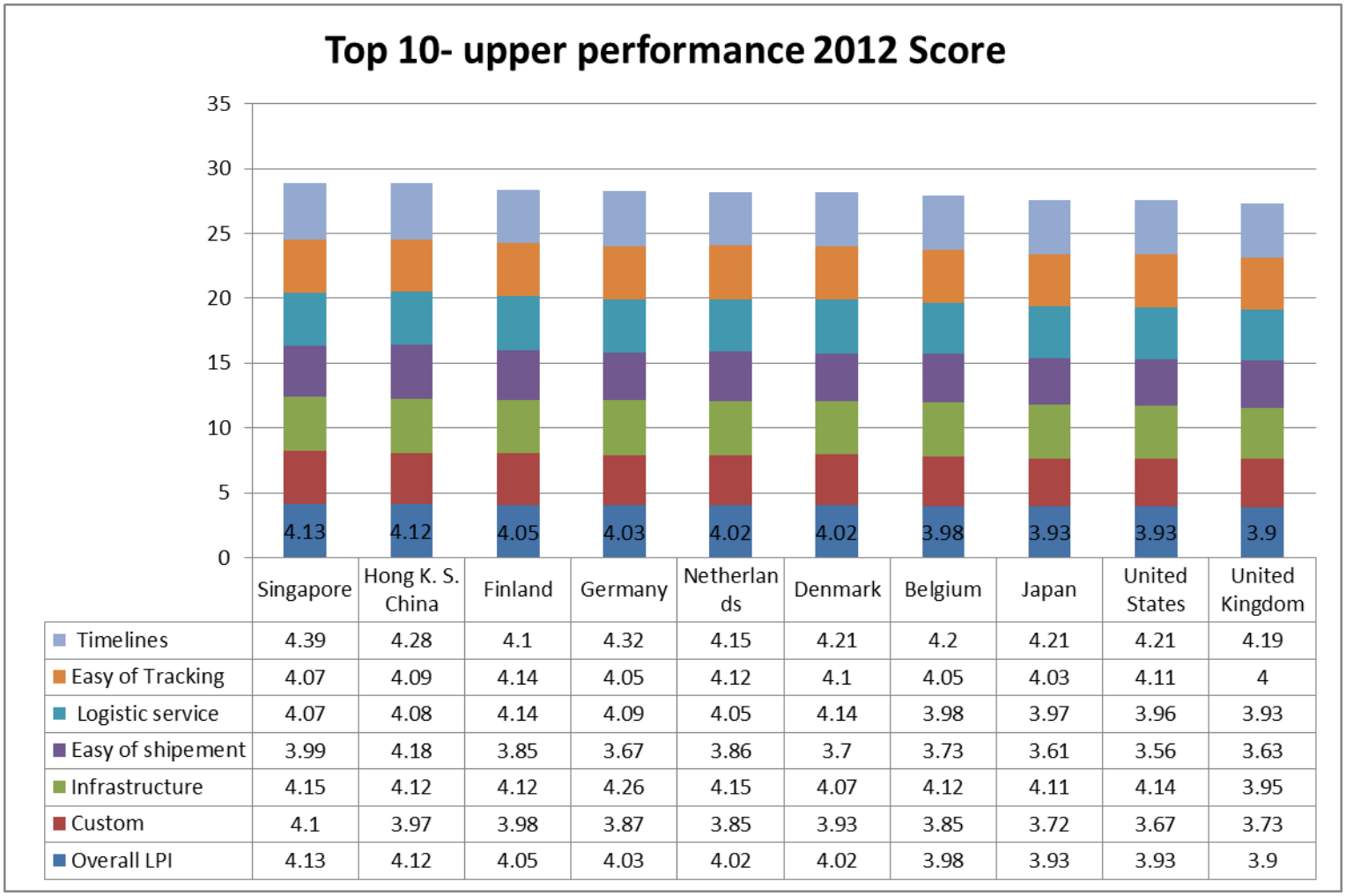
Ability to track and trace consignments: - is important to identify the exact location and the route of each consignment up to its delivery to the end customer. Traceability is the result of the activity of the logistics sector as a whole, since all parties in the goods' supply chain are involved in this component. Since lower income countries do benefit significantly from improved tracking and tracing, it can be regarded as one of the priority areas for future investments in trade logistics.

Concerning to the logistic performance evaluation results of Tracking & tracing across the countries. Finland had found on the 1st top best position, followed by Netherlands and United States. However, Japan and United Kingdom are lower ranks behind Tracking & tracing, as compared to top 10 upper performance LPI scorers.

**Timeliness**

Regarding to the reliability of the supply chains is generally measured by the timeliness of the delivery. However, longer lead times do not always mean unreliability but instead are the outcome of steady demand trends and higher predictability. Based on the logistic performance level of Timeliness. Singapore had found on the top position, followed by Germany and Hong K. China. However, Belgium and Finland are lower rank in terms Timeliness as compared to top-10 upper performance LPI scorers.

Figure. 4.5: Top 10 upper performance  Score-2012




| | Singapore | Hong K. S. China | Finland | Germany | Netherlands | Denmark | Belgium | Japan | United States | United Kingdom |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.39 | 4.28 | 4.1 | 4.32 | 4.15 | 4.21 | 4.2 | 4.21 | 4.21 | 4.19 |
| Easy of Tracking | 4.07 | 4.09 | 4.14 | 4.05 | 4.12 | 4.1 | 4.05 | 4.03 | 4.11 | 4 |
| Logistic service | 4.07 | 4.08 | 4.14 | 4.09 | 4.05 | 4.14 | 3.98 | 3.97 | 3.96 | 3.93 |
| Easy of shipement | 3.99 | 4.18 | 3.85 | 3.67 | 3.86 | 3.7 | 3.73 | 3.61 | 3.56 | 3.63 |
| Infrastructure | 4.15 | 4.12 | 4.12 | 4.26 | 4.15 | 4.07 | 4.12 | 4.11 | 4.14 | 3.95 |
| Custom | 4.1 | 3.97 | 3.98 | 3.87 | 3.85 | 3.93 | 3.85 | 3.72 | 3.67 | 3.73 |
| Overall LPI | 4.13 | 4.12 | 4.05 | 4.03 | 4.02 | 4.02 | 3.98 | 3.93 | 3.93 | 3.9 |

Source: world bank report 2012.

LPI is an internationally adopted tool for measuring the trade and logistics facilitation in a given country. LPI promotes the understanding of key issues and options for improvement of logistics performance. The LPI entails several components assessing the logistics environment: customs clearance performance, quality of transport infrastructure, competitive and efficient shipment process, and logistics process quality, international tracking & tracing of shipments, international shipments frequency. And also, LPI allows for assessment of logistics performance trends while performance is measured through a five-point scale. The figure below illustrated, top-10 lower performing countries, competing amongst 155 countries. According to the World Bank (2012) LPI report. Comoros had taken the top of lower -performing categories. with an LPI-score of 2. 14.

**Customs clearance process**

The efficiency of customs and border clearance measures these procedures in terms of speed, simplicity and predictability when dealing with customs and other border agencies. This is one of the functional components to evaluate countries progresses and this dimension used as a comparative basis, Sudan is the only country among lower-income economies that performs better than the others lower-10.in the LPI score for customs and other border agencies. Followed by Nepal and Comoros. However, Djibouti and Burundi are lower rank concerning to Customs clearance as compared with all lower-10. Performance LPI scorers.

**Infrastructure**

The logistic performance evaluation results of Infrastructure among the countries. Sierra Leone had found in the 1$^{st}$-top best position followed by Sudan and Chad. However, on the situation of Infrastructure factors 'Djibouti and Congo. Republic was at worst lower position as compared to top-10 lower performance LPI scorers. Even the indicated countries average LPI scores were rapidly increased their customs status varied once with the other. This indicated that, the performance results. Lower income countries have no improvement from the report trends.

**International shipments**

Correspondingly six-Indicators for measuring the national logistics performance are vital for efficient policy and operational regulations. Even if the categories are lower- performance economies, the evaluation analysis explain that, In case of the basic element which helps to associate the logistic performance level of International shipments of the countries. Eritrea has found in the top position. With the rank of 97$^{th}$ followed to Haitis and Congo Rep. However, the other lower economies are no more important devotions to perform, on the area of International shipments.

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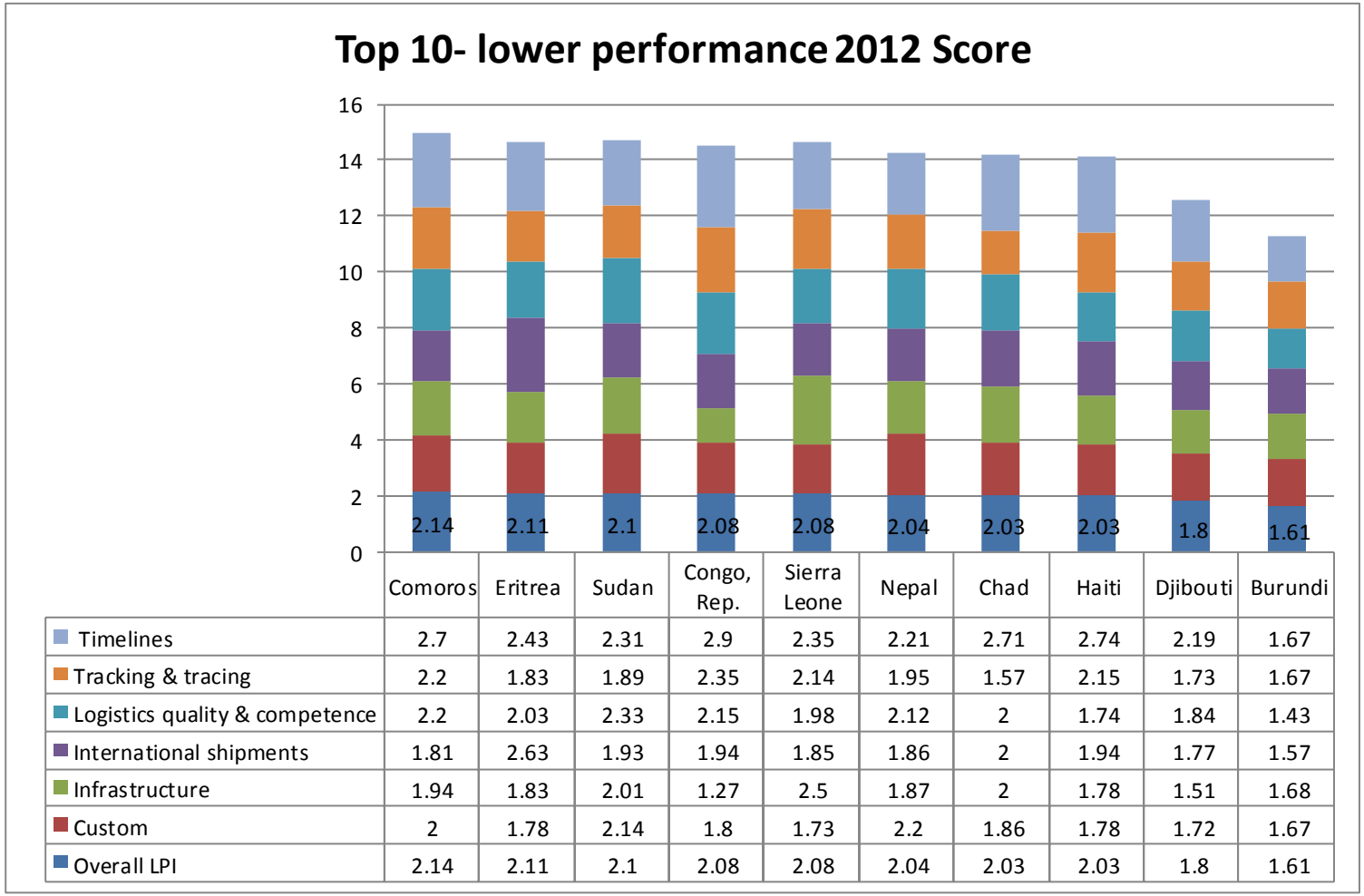
**Tracking and tracing**

Tracking and Tracing; ability to track and trace consignments, tracking system for the delivery of goods contributes to reducing the costs for claims as a consequence of goods routing errors. There is increasing demand for tracking and tracing in the supply chain, statutory requirements are growing stricter, and there is increasing pressure to develop standardized systems to tackle such logistics needs (Kandel et al., 2011). Concerning to these components, the logistics performance index- 2012 of the lower top-10 result shows. Congo, Rep had a top-place performance, followed by Comoros and Haiti. However, the worst performing country has, Chad. This implies Countries at similar performance levels may haven't substantial different ranks, especially in the lower income ranges. Because of economic disadvantage, politics, corruption, poverty exposure etc. had the exposure of the poor countries.

**Timeliness**

The index is applied for identification of the issues and opportunities as concerns each country's transport infrastructure, logistics and supply chains efficiency. Countries at similar performance levels may have substantially different ranks, especially in the middle and lower country income ranges. Likewise, reliability and timeliness are vital considerations for firms involved in international supplies chains. Timeliness is the frequency with which shipments reach consignees within scheduled or expected delivery times. Even though, this category was at the lower edged and low income-economy, Haiti had took the 129$^{st}$ position among lower world and lower top-10-performing categories followed by Chad and Eritrea, and the others from the lower 10-edge countries are worst.These implies that top -10- bottom performing countries have un exposure of politics unrest. Inefficient economic performance or GDP, GNP.

Figure.4.6: Top 10 lower performance Score-2012




| | Comoros | Eritrea | Sudan | Congo, Rep. | Sierra Leone | Nepal | Chad | Haiti | Djibouti | Burundi |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 2.7 | 2.43 | 2.31 | 2.9 | 2.35 | 2.21 | 2.71 | 2.74 | 2.19 | 1.67 |
| Tracking & tracing | 2.2 | 1.83 | 1.89 | 2.35 | 2.14 | 1.95 | 1.57 | 2.15 | 1.73 | 1.67 |
| Logistics quality & competence | 2.2 | 2.03 | 2.33 | 2.15 | 1.98 | 2.12 | 2 | 1.74 | 1.84 | 1.43 |
| International shipments | 1.81 | 2.63 | 1.93 | 1.94 | 1.85 | 1.86 | 2 | 1.94 | 1.77 | 1.57 |
| Infrastructure | 1.94 | 1.83 | 2.01 | 1.27 | 2.5 | 1.87 | 2 | 1.78 | 1.51 | 1.68 |
| Custom | 2 | 1.78 | 2.14 | 1.8 | 1.73 | 2.2 | 1.86 | 1.78 | 1.72 | 1.67 |
| Overall LPI | 2.14 | 2.11 | 2.1 | 2.08 | 2.08 | 2.04 | 2.03 | 2.03 | 1.8 | 1.61 |

**source : world bank 2012 report.**

The LPI is a composite index based on proxy measures for transport and information infrastructure, supply chain management (SCM) and trade facilitation capabilities, which are calculated based on a world survey of international freight forwarders and express carriers. The figure below exemplified, top-10 upper performing countries, LPI- 2014 score, Germany had took the 1st top best position, 4.12. Followed by Netherlands and Belgium. However, Japan has worst scores as compared with top 10 high-income economies. From the results observations, European countries, dominates the world economies. With just a heading, Singapore, United States and Japan.

**Customs clearance process**

Regarding to Customs clearance process, the logistic performance measuring result of the country. Norway had found on the 1st top position with the score of 4.21, followed by Germany and Singapore. However, Japan and United States are lower rank for the core factors of Customs clearance as compared only with all top 10 upper performance LPI scorers.

**Infrastructure**

Extensive and efficient infrastructure is critical for ensuring the effective functioning of the country's economy, as it is an important factor in determining the location of economic activity and the kinds of activities developed in a particular instance Well-developed infrastructure reduces the effect of distance between regions, integrating the national market and connecting it at low cost to markets in other countries and regions. Aiming to this factor the logistic performance evaluation reports of Infrastructure crossways the countries. Germany has been found on the top position followed by Singapore and Netherlands. However, Sweden and Luxembourg are lower rank for the core factors of Infrastructure as compared with all tope 10 upper performance LPI scorers.

**Easy of International shipments**

International shipment is the only area that shows concrete improvement. The area indicates the ease of arranging competitively priced shipments. Because of both domestic and international factors. Domestically, there are many attempts that both government and private to reduce logistics cost as well as facilitate logistics activities

Regarding to this factors, the logistic performance measurement outcomes of International shipments of the country. Luxembourg had found on the 1st top position, followed by Belgium and Sweden However, United States and Norway are lower rank concerning to International shipments as compared with all tope 10 upper performance LPI scorers.

**Logistics quality and competence**

Logistics quality and competence can be defined as the degree in which the performance of the freight transport service operations across modes in the supply chains meets stated service criteria.

Considering the importance of the LPI evaluation report 2014- illustrated on the figure-7 below, Logistics quality & competence of the countries. Norway were found on the top position followed by Netherlands and Germany However, Japan and Luxembourg are lower rank, through the evaluation factors of Logistics quality & competence as compared with top 10 upper performance LPI scorers.

**Tracking and tracing**

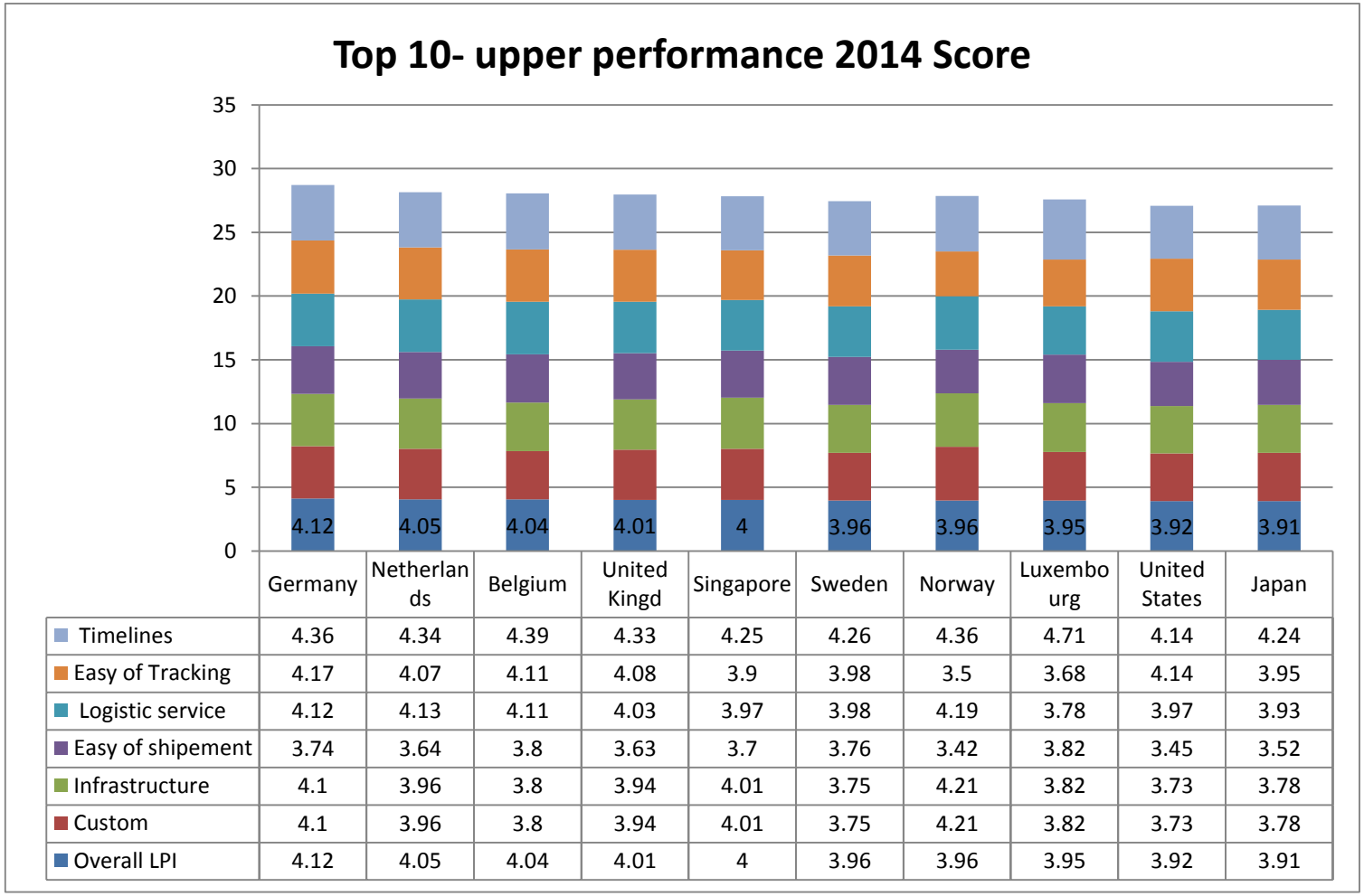
Track and trace within supply chains is an important issue for supply chain planning and executing. Therefore, not only transportation but also production processes should be able to be monitored. But especially potentials of tracking transport processes are immense because they are often bottlenecking within supply chains because of high traffic volumes and high uncertainty of planned execution since possible disruptions. An early identification of disruptions is quite important to safeguard subsequent processes

Considering this basic indicator, the logistic performance evaluation result of Tracking & tracing evidenced. Germany had found on the top position followed by United States and Belgium. However, Luxembourg and Norway are lower rank for the core factors of Tracking & tracing as compared with all top 10 upper performances LPI scorers.

**The Timeline Factors**

This entails measurement of timeliness in logistics performance operations. As poor state of infrastructure and lack of connectivity or link to economic centers, the phenomena impact logistics performance and international trade competitiveness. Based on the LPI measurement and evaluation of the timeline factor crossways the countries'. Luxembourg were found on the top 1$^{st}$- position followed by Belgium and Germany, However, Japan and United States are lower rank for the core factors of Timeliness as compared with all tope 10 upper performance LPI score.

**Figure 4.7 : Top 10 upper performance Score-2014.**




| | Germany | Netherlands | Belgium | United Kingd | Singapore | Sweden | Norway | Luxembourg | United States | Japan |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.36 | 4.34 | 4.39 | 4.33 | 4.25 | 4.26 | 4.36 | 4.71 | 4.14 | 4.24 |
| Easy of Tracking | 4.17 | 4.07 | 4.11 | 4.08 | 3.9 | 3.98 | 3.5 | 3.68 | 4.14 | 3.95 |
| Logistic service | 4.12 | 4.13 | 4.11 | 4.03 | 3.97 | 3.98 | 4.19 | 3.78 | 3.97 | 3.93 |
| Easy of shipement | 3.74 | 3.64 | 3.8 | 3.63 | 3.7 | 3.76 | 3.42 | 3.82 | 3.45 | 3.52 |
| Infrastructure | 4.1 | 3.96 | 3.8 | 3.94 | 4.01 | 3.75 | 4.21 | 3.82 | 3.73 | 3.78 |
| Custom | 4.1 | 3.96 | 3.8 | 3.94 | 4.01 | 3.75 | 4.21 | 3.82 | 3.73 | 3.78 |
| Overall LPI | 4.12 | 4.05 | 4.04 | 4.01 | 4 | 3.96 | 3.96 | 3.95 | 3.92 | 3.91 |

Source: world bank report 2014.

The monitoring and management of logistics service and supply chain networks are nowadays considered an important issue for global manufacturing companies. This aspect has substantial and growing impact on tracking and tracing the logistics and delivery network. It is considered one of the motivating factors in maintaining customer satisfaction and building trust among manufacturers, suppliers and potential customers (Fritz and Schiefer, 2009; Claesson and Hilletofith, 2011; Shamsuzzoha and Helo, 2011). In practice, the current business world is replete with delivery and supportive logistics chains.

## Customs clearance

Customs has been collecting more revenue, facilitating more trade, and fighting more corruption to improve the clearing process, installation of a new customs clearance system, began reforming, not just to track processing for each consignment but also to measure the performance of customs officers. Based on the LPI 2014 reports, Djibouti had taken 134$^{th}$ rank. However, the worst countries, Congo, Rep. 160$^{th}$

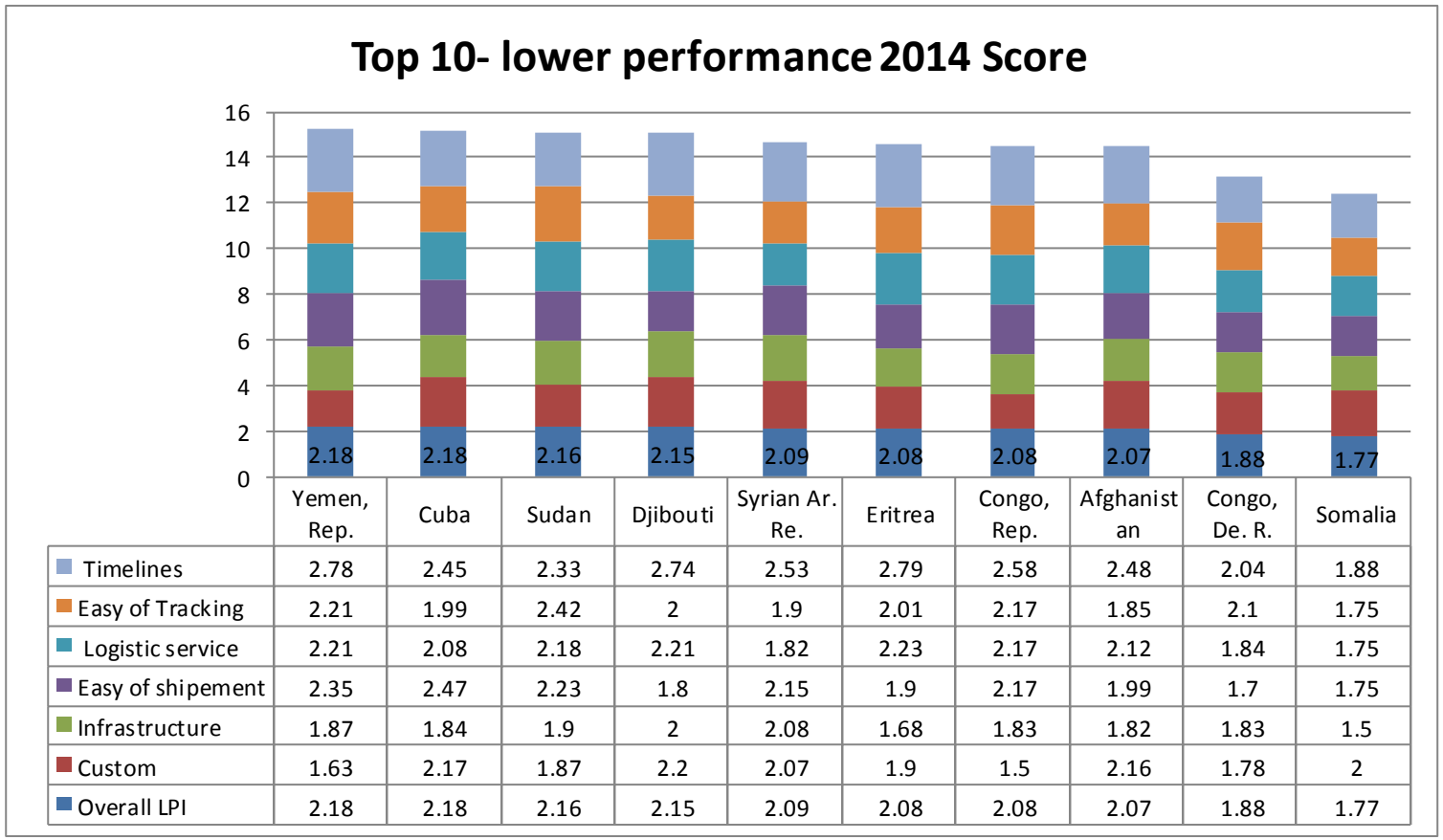
## Infrastructure

The worldwide Logistics Performance Index (LPI) was developed to provide a better assessment of countries' ranking in managerial and physical effectiveness of their logistics. On a global level, a gradual convergence of the LPI is observed. Mostly, it is the outcome of diffusion of transport infrastructures and services, a process favored by the growing presence of global freight carriers, such as maritime shipping companies, global terminal operators, air freight and even third-party logistics providers. Aiming to this factor the logistic performance evaluation reports of Infrastructure crossways the countries. Syrian Arab Republic has been found on the top position followed by Djibouti and Yemen Rep. However, Afgahanistan and Somali are lower rank for the core factors of Infrastructure as compared with all bottom 10 lower performance LPI scorers.

Timeline

Regarding to the timeline efficiency the reliability of the supply chains is generally measured by the scheduled commitments of the delivery time. However, longer lead times do not always mean unreliability but instead are the outcome of steady demand trends and higher predictability. Based on the logistic performance level of Timeliness. Eritrea had found on the top position, followed by Yemen and Djibouti. However, Congo Demo.Rep. and Somalia are lower rank in terms Timeliness as compared to bottom-10 lower performance LPI scorers.

Figure 4.8: Top 10- Lower performance Score-2014




| | Yemen, Rep. | Cuba | Sudan | Djibouti | Syrian Ar. Re. | Eritrea | Congo, Rep. | Afghanistan | Congo, De. R. | Somalia |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 2.78 | 2.45 | 2.33 | 2.74 | 2.53 | 2.79 | 2.58 | 2.48 | 2.04 | 1.88 |
| Easy of Tracking | 2.21 | 1.99 | 2.42 | 2 | 1.9 | 2.01 | 2.17 | 1.85 | 2.1 | 1.75 |
| Logistic service | 2.21 | 2.08 | 2.18 | 2.21 | 1.82 | 2.23 | 2.17 | 2.12 | 1.84 | 1.75 |
| Easy of shipement | 2.35 | 2.47 | 2.23 | 1.8 | 2.15 | 1.9 | 2.17 | 1.99 | 1.7 | 1.75 |
| Infrastructure | 1.87 | 1.84 | 1.9 | 2 | 2.08 | 1.68 | 1.83 | 1.82 | 1.83 | 1.5 |
| Custom | 1.63 | 2.17 | 1.87 | 2.2 | 2.07 | 1.9 | 1.5 | 2.16 | 1.78 | 2 |
| Overall LPI | 2.18 | 2.18 | 2.16 | 2.15 | 2.09 | 2.08 | 2.08 | 2.07 | 1.88 | 1.77 |

**source : world bank 2014 report.**

**customs and border clearance measure**:- the procedures in terms of speed, simplicity and predictability. Aiming to these basic elements, the logistic performance evaluations results indicates**.** Singapore had found on the 1st- top position, followed by Germany and Netherlands. However, Austria and United States are lower rank for the core factors of Customs as compared with all top- 10 upper performance LPI scorers.

**Infrastructure; -** In logistics value chain, efficient infrastructure is critical for confirming the effective functioning of the country's' economy, the quality and comprehensiveness infrastructure networks significantly influence economic growth and reduce income inequalities and poverty in a variety of ways. Based on this element, the logistic performance report (exhibited in below figure 9). Germany had taken the 1st- top position, followed by Netherlands and Sweden However, Austria and Belgium are lower rank concerning to Infrastructure facilities, as compared with all top- 10 upper performance LPI scorers.

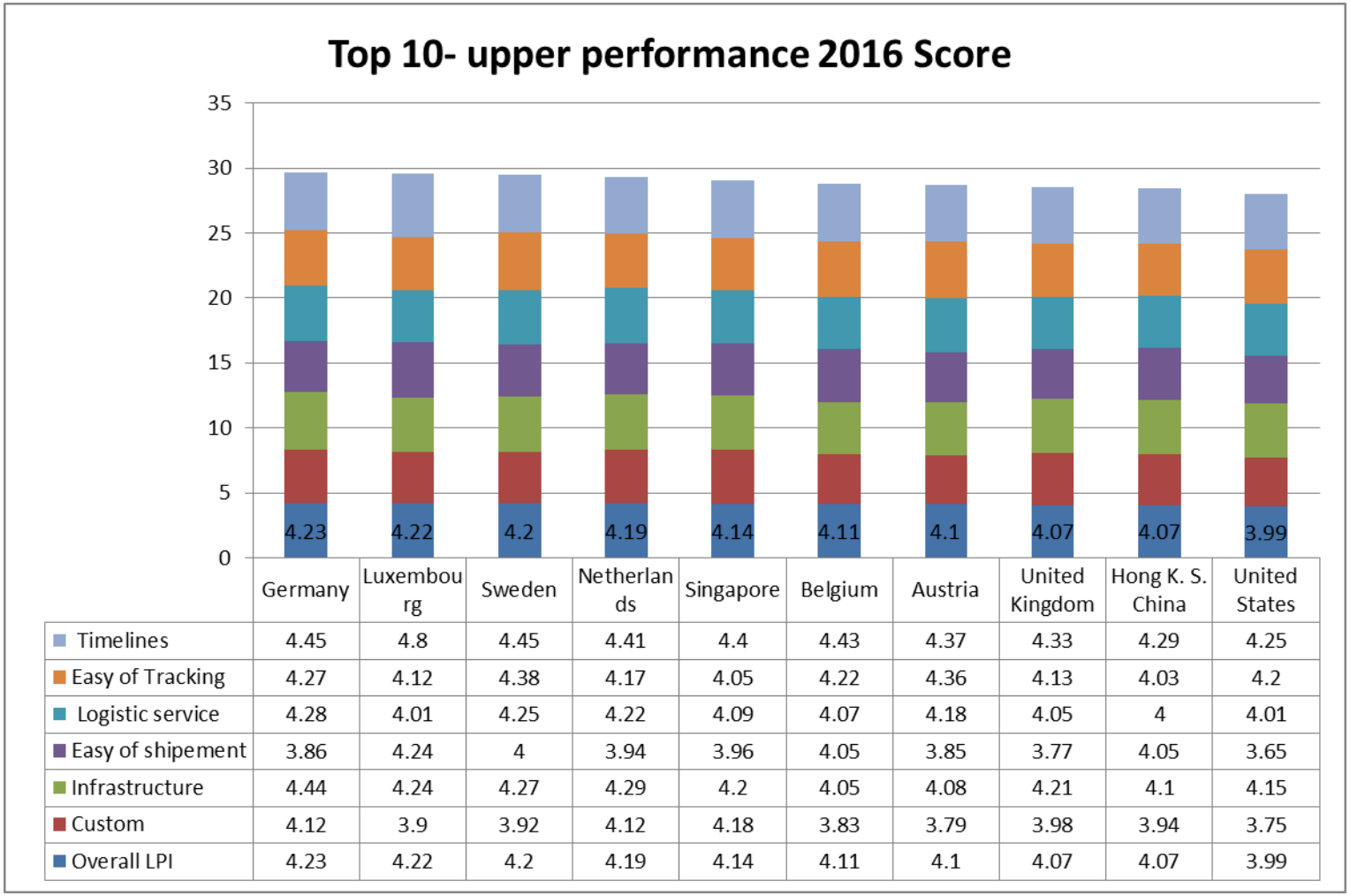
International shipments;- Regarding to the logistic performance evaluations of International shipments results, Luxembourg had took the 1st- top position, followed by Hong K. S. China and Belgium However, United Kingdom and United States are lower rank for the indicators of International shipments, as compared with all tope 10 upper performance LPI scorers.

**Logistics quality and competence;-** Regarding to Tracking and Tracing ability, the logistic performance results report -2016. Germany had taken the 1st-top place. followed by Sweden and Netherlands However, Luxembourg and Hong K. S. China are lower rank among all top 10 upper economies. Even the specified countries average LPI scores were rapidly increased their customs status varied once with the other. This indicated that the high-income economic countries adapt efficient Logistics quality & competence.

**Tracking and tracing; -** depend on recent technological developments for monitoring the material flow, these reduce tracking Lead time. Based on these processes, Sweden had taken the 1st- top position, 4.38. followed by Austria and Germany However, Singapore and Hong K. S. China are lower rank for the factors of Tracking & tracing as compared with all tope 10 upper performance LPI scorers.

**Timeliness:-** According to the LPI – Timeliness - evaluations among the countries. Luxembourg was found on the 1st top position, followed by Germany and Sweden. However, Hong K. S. and United States was lower end for these factors among with top-10 upper economies. Knowingly, countries with high income economy have a concern to accomplish customers commitment efficiently and based on schedule time.

**Figure 4.9: Top 10- upper performance Score-2016**




| | Germany | Luxembourg | Sweden | Netherlands | Singapore | Belgium | Austria | United Kingdom | Hong K. S. China | United States |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.45 | 4.8 | 4.45 | 4.41 | 4.4 | 4.43 | 4.37 | 4.33 | 4.29 | 4.25 |
| Easy of Tracking | 4.27 | 4.12 | 4.38 | 4.17 | 4.05 | 4.22 | 4.36 | 4.13 | 4.03 | 4.2 |
| Logistic service | 4.28 | 4.01 | 4.25 | 4.22 | 4.09 | 4.07 | 4.18 | 4.05 | 4 | 4.01 |
| Easy of shipement | 3.86 | 4.24 | 4 | 3.94 | 3.96 | 4.05 | 3.85 | 3.77 | 4.05 | 3.65 |
| Infrastructure | 4.44 | 4.24 | 4.27 | 4.29 | 4.2 | 4.05 | 4.08 | 4.21 | 4.1 | 4.15 |
| Custom | 4.12 | 3.9 | 3.92 | 4.12 | 4.18 | 3.83 | 3.79 | 3.98 | 3.94 | 3.75 |
| Overall LPI | 4.23 | 4.22 | 4.2 | 4.19 | 4.14 | 4.11 | 4.1 | 4.07 | 4.07 | 3.99 |

**Source: world bank 2016 report.**

**Custom Clearance process**

Customs is the main body of a country to administrate the action of importing or exporting commodity and to collect the duties. The customs clearance efficiency and service level not only affect the trade efficiency, but also creates great impact on the investment, employment and even regional economic development (Yaqin and Yuming, 2010). Customs department operates in an increasingly complex and rapidly changing environment characterized by new trade patterns, demands for better trade facilitation and efficiencies, while at the same time dealing with growing safety and security concerns and new risks. Considering to the top-10 lower perfuming countries competitions, The 1st performing country on this component was Mauritania followed by Singapore and Zimbabwe. However, the worst performing country, Syrian Arab Republic only among top-10 lower economies. These implies the lower performing countries are highly exposed to economic inefficiency.

## Trade-related infrastructure

The quality and availability of trade-related infrastructure, especially roads, still constrained logistics performance in developing countries, especially for countries with the lowest incomes. Yet countries nearer the middle of the LPI rankings are also hindered by the quality and availability of roads and ports. Regarding to infrastructure, Zimbabwe had taken the upper rank -123th among the lower -ten, followed by Tajikistan holds 130th rank. However, the worst performing country, from the top 10-lower perfuming countries are, Syrian Arab Republic-160th.

## Logistics quality and competence

The logistics quality and competence has also central to trade efficiency and also Logistics services is strongly associated with the reliability of supply chains and the predictability of service delivery, to producers and exporters. Considering these factors, Lesotho had taken the top rank -138th, followed by Zimbabwe holds 141th rank. However, the worst performances, from the top 10- lower perfuming countries, Syrian Arab Republic-160.

**International Shipment**

International shipment it is the critical measure area that needs concrete improvement. The area indicates the ease of arranging competitively priced shipments. This can be because of both domestic and international factors. There are many attempts both government and private to reduce logistics cost as well as facilitate logistics activities. From the International context logistics service providers are fighting for the national and regional economic grows continuously. Logistics service providers have become key players and to improve logistics and supply chain. And (the figuer below illustrated). Sierra Leone had acquired the 1st rank among among the lower countries with these components, followed by Lao PDR. Howevere the worst performing countries from the categories, Syrian Arab Republic.

**Tracking and tracing**

The information management across the logistics lifecycle can be improved through real-time tracking and tracing of delivery items. In order to improve delivery lead time, the selection process of technology depends on the actual requirements of the tracking environments such as cost, lead time, convenience of use, etc. Regarding to the vital component, Syrian Arab Republic, holds 138th rank. and all other are worst

**Timeliness of shipments in reaching destination**

Timeliness of shipments is the schedule of in reaching destination measures, how reliably shipments meet the promised delivery times. The reliability of the supply chains is generally measured by the timeliness of the delivery. However, longer lead times do not always mean unreliability but instead the outcome of steady demand trends and higher predictability. On the contrary and due to the present market situation, transshipments are causing the highest level of delivery delays mainly affected by the operators need to cut on cost. Concerning timeliness . concerning these idea, Lao PDR Has the top of the lower category among the poor economies. And the other are worst.

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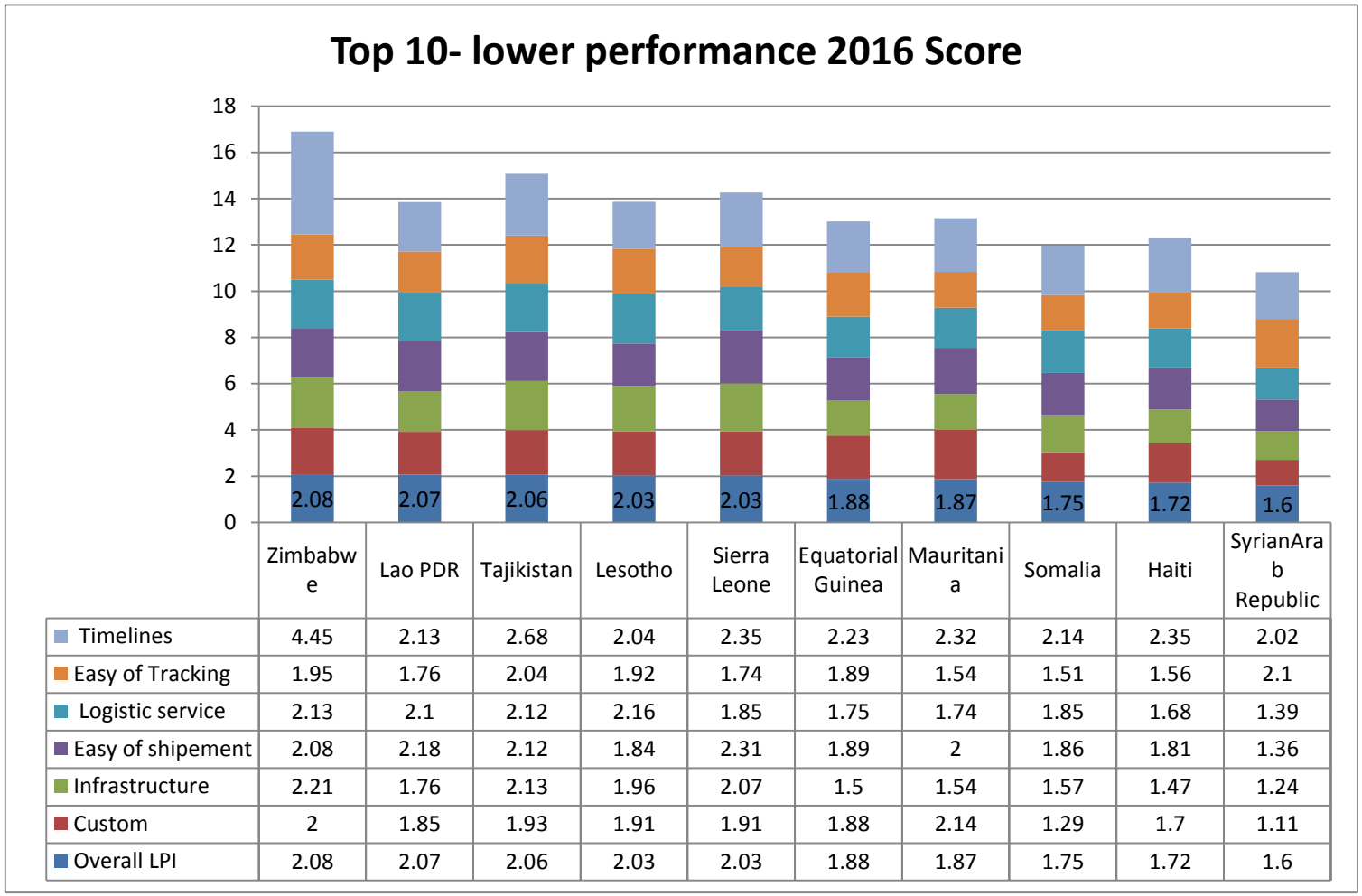
**FIG 4.10 :** Top 10- Lower performance Score-2016




| | Zimbabwe | Lao PDR | Tajikistan | Lesotho | Sierra Leone | Equatorial Guinea | Mauritania | Somalia | Haiti | SyrianArab Republic |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.45 | 2.13 | 2.68 | 2.04 | 2.35 | 2.23 | 2.32 | 2.14 | 2.35 | 2.02 |
| Easy of Tracking | 1.95 | 1.76 | 2.04 | 1.92 | 1.74 | 1.89 | 1.54 | 1.51 | 1.56 | 2.1 |
| Logistic service | 2.13 | 2.1 | 2.12 | 2.16 | 1.85 | 1.75 | 1.74 | 1.85 | 1.68 | 1.39 |
| Easy of shipement | 2.08 | 2.18 | 2.12 | 1.84 | 2.31 | 1.89 | 2 | 1.86 | 1.81 | 1.36 |
| Infrastructure | 2.21 | 1.76 | 2.13 | 1.96 | 2.07 | 1.5 | 1.54 | 1.57 | 1.47 | 1.24 |
| Custom | 2 | 1.85 | 1.93 | 1.91 | 1.91 | 1.88 | 2.14 | 1.29 | 1.7 | 1.11 |
| Overall LPI | 2.08 | 2.07 | 2.06 | 2.03 | 2.03 | 1.88 | 1.87 | 1.75 | 1.72 | 1.6 |

Source : world bank 2016 report.

World Bank has developed an international logistics assessment tools, called "Logistics Performance Index (LPI)''. LPI comprises of 6- components should be included in the LPIs report. Because of Logistics is an elevated priority for all countries, to facilitating International trade and transport service have at the core of stimulating economic development, several countries have developed comprehensive national logistics strategies. Well-functioning domestic and international logistics is a precondition of national competitiveness; the rests have been fragile and not Well-functioning. So that, these researches applies the fact-based metrics, to assess impacts, and compare global advances in logistics chain and It allows for comparisons of the logistics performance of both the international and domestic trade across 160 countries. The table below illustrated the first top 10 highest scorer countries. According to the 2018 LPI overall report Germany had been the first best performing country, with a score of 4.13. Followed by Sweden and Belgium respectively. In these new versions also European dominates the upper rank of the world.

**Custom clearing procedure**

Regarding custom clearing procedure LPI measures the affectivity and efficiency of customs information in terms of speed, simplicity, and predictability. Considering that, the best performing country on this components Germany has 1$^{st}$ rank with the score of (4.10), followed by Belgium and Netherland. However, the worst performing country, from the top 10 upper perfuming countries were listed on the LPI ranking at the end of top countries, Denmark.

**Transport infrastructure**

Transport infrastructure has a significant impact on the productivity and the cost structure of businesses, an effective and efficient logistics system is the cornerstone of a prosperous economy in attracting foreign investment. The best performing country on this component has, Austria with score of (4.26), followed by Germany, Japan and United Kingdom. However, the worst performing country, from the top 10 upper perfuming countries had been listed at the lower area of LPI ranking, Denmark.

**Logistics quality and competence**

Logistics quality and competence are mostly performed by private parties, and include all services performed to move goods from the producer to the customer. As illustrated on the bellow figure, the best performing country on this component was Belgium and Netherland with the scores of (4.14), followed by Austria and Sweden. However, the worst performing country, from the top 10 upper perfuming economies had been listed at the end of top 10 LPI ranking, Finland. And also, LPI-(2016) report exhibited, Germany has at the top first rank performance as compared to current year result.

**International shipments**

International shipments, defined as the ease of arranging competitively priced shipments. The term international shipments are easy to understand, it concerns all shipments to and from the specified country than originated in another country. The best performing country on this component has Sweden, with the score of (4.18), followed by Germany and Japan. However, the worst performing country, from the top 10 upper perfuming economies has been listed on the lower area of top -10 LPI ranking, United Kingdom.

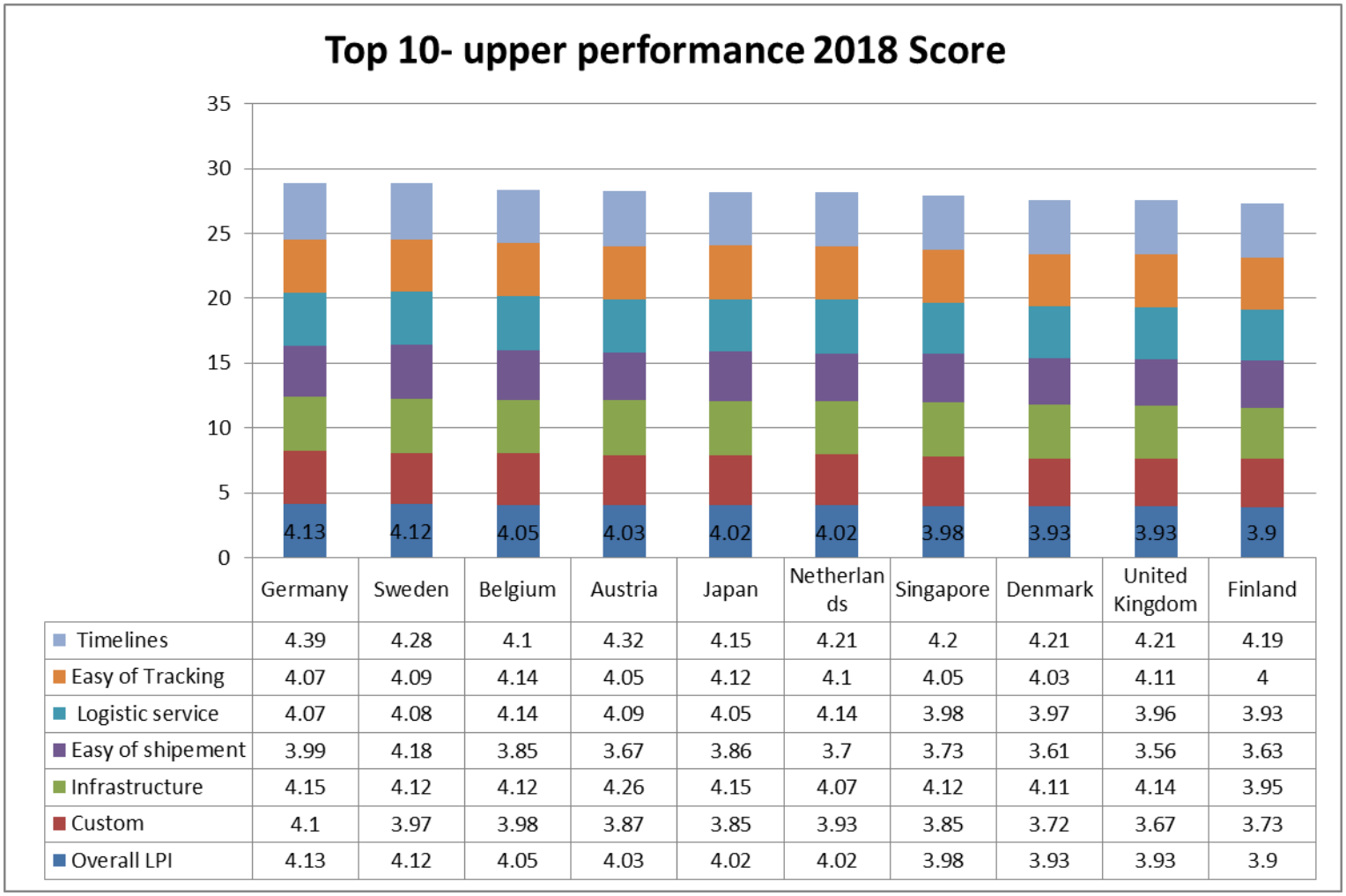
**Tracking and Tracing**

Tracking and Tracing is the ability to track and trace consignments, meaning that at every certain point in time, the element should be a major area for investments. Concerning to this factor, Belgium scores of (4.14) has been took the first rank, from the best performing country on this component, followed by Japan and United Kingdom. While Finland performs the worst from the top economies only. Even if, these years performance scored high and included in top ten, Finland (2016) performance hasn't included to top-10 categories of the world LPI reports.

**Timeliness**

Reliability and timeliness are key considerations for firms involved in global value chains. Indeed, the ability to ensure on time delivery and clearance and the frequency with which shipments reach consignees within scheduled or expected delivery times.The table below illustrated majority of the top LPI performers' countries had a better punctuality, Even though, Germany has took the 1$^{st}$ - highest best score among the top-10 high income categories, followed by Austria and Sweden. However, Belgium were worst rank, as compered only with top ten

**Figure 4.11: Top 10- upper performance Score-2018**




| | Germany | Sweden | Belgium | Austria | Japan | Netherlands | Singapore | Denmark | United Kingdom | Finland |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 4.39 | 4.28 | 4.1 | 4.32 | 4.15 | 4.21 | 4.2 | 4.21 | 4.21 | 4.19 |
| Easy of Tracking | 4.07 | 4.09 | 4.14 | 4.05 | 4.12 | 4.1 | 4.05 | 4.03 | 4.11 | 4 |
| Logistic service | 4.07 | 4.08 | 4.14 | 4.09 | 4.05 | 4.14 | 3.98 | 3.97 | 3.96 | 3.93 |
| Easy of shipement | 3.99 | 4.18 | 3.85 | 3.67 | 3.86 | 3.7 | 3.73 | 3.61 | 3.56 | 3.63 |
| Infrastructure | 4.15 | 4.12 | 4.12 | 4.26 | 4.15 | 4.07 | 4.12 | 4.11 | 4.14 | 3.95 |
| Custom | 4.1 | 3.97 | 3.98 | 3.87 | 3.85 | 3.93 | 3.85 | 3.72 | 3.67 | 3.73 |
| Overall LPI | 4.13 | 4.12 | 4.05 | 4.03 | 4.02 | 4.02 | 3.98 | 3.93 | 3.93 | 3.9 |

**Source world bank 2018 report**

The Logistics Performance Index (LPI) was introduced in 2007 as a tool to give countries insight in their logistical performance. It is an interactive benchmarking tool that countries used to identify possible challenges and opportunities. The ranking has been drawn up based on the overall score of countries and this evaluation enclosed to the lower top-10 and lower- income country. In these recent versions of the 2018 report Madagascar and Bolivia was the top performing country, with an LPI score of 2.39 and 2.36 respectively. The worst performing country in the most bottom parts of the report, with a score of, 1.95, was Afghanistan.

Customs Clearing Process**:**

From these points of view, the LPI completions of the customs clearing process. The moderate performing countries among the categories are Guyana has score of 2.55. Followed by Fiji 2.41 and Madagascar, Bolivia scores 2.32. However, Afghanistan performs the worst. Score, 1.73. These imply that, because of poor economies, countries can't prioritize trade and trade facilitations process.

Infrastructure

Infrastructure seems like a very logical factor in logistical performance since it is one of the basic needs to facilitate transportation of goods. According to the LPI ranking and the below figure illustrated that Fiji has a little preferable infrastructure score of 2.40, followed by Mauritanian and Senegal. While Afghanistan has the worst. The countries with the worst performance in 2018 reports categorized to, least developing countries that are also landlocked countries, small-island states, or post conflict countries.

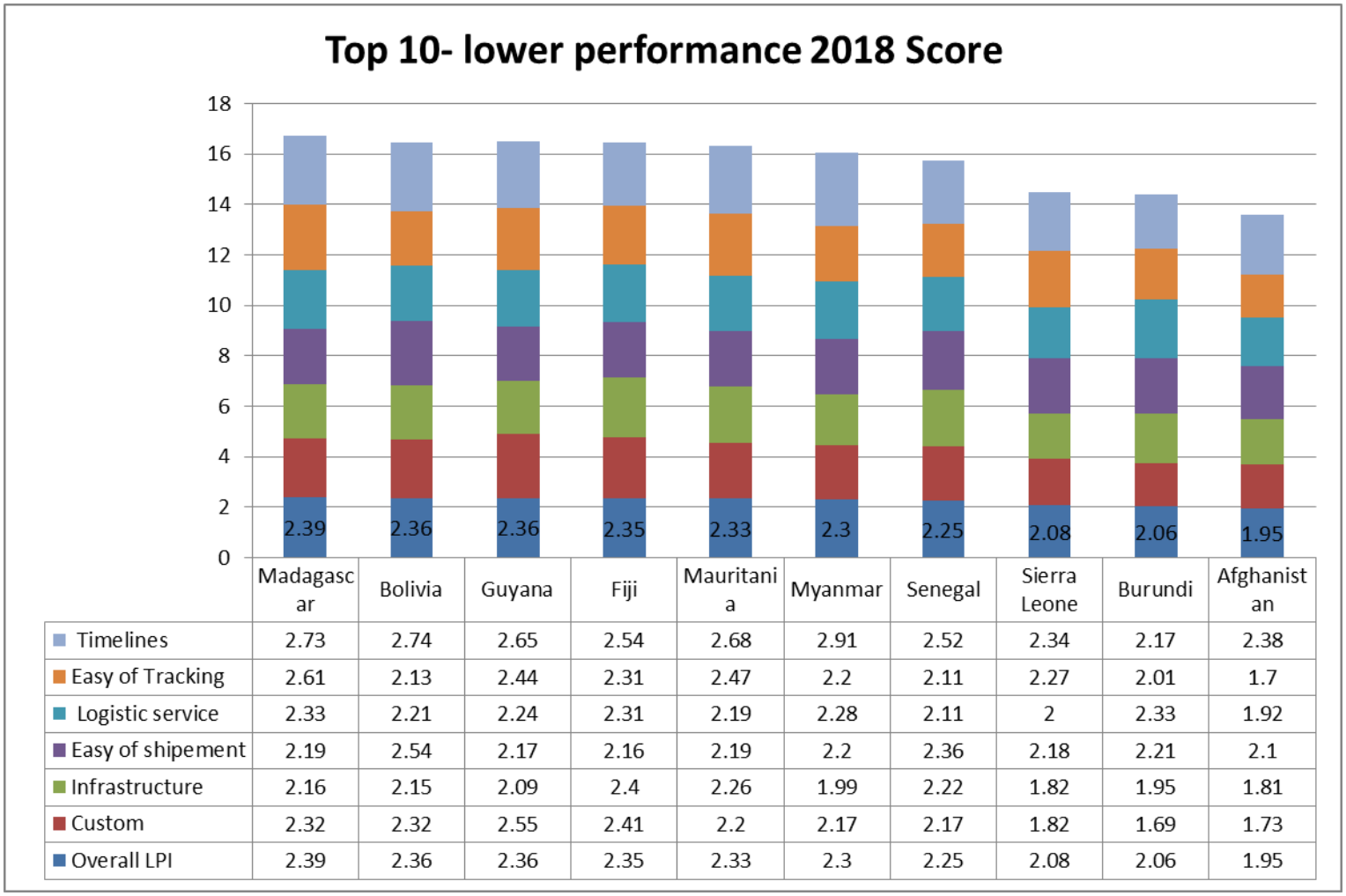
## Tracking and tracing

The concept of tracking and tracing involves managing the successive links between batches and logistic units throughout the entire supply chain network. Based on the LPI ranking. Madagascar has a moderate performance score of 2.61, followed by Mauritanian and Guyana and Afghanistan score of 1.70. Was the worst performer regarding to this factor.

**Timeliness**

Timeliness refers to the factor that not only about fast delivery but mostly on the predictability of when the shipments will arrive. Based on these competitions. Myanmar has performed score of 2.91, followed by Bolivia and Madagascar score of 2.74 and 2.73. Burundi was the worst performer on this category, 2.17.

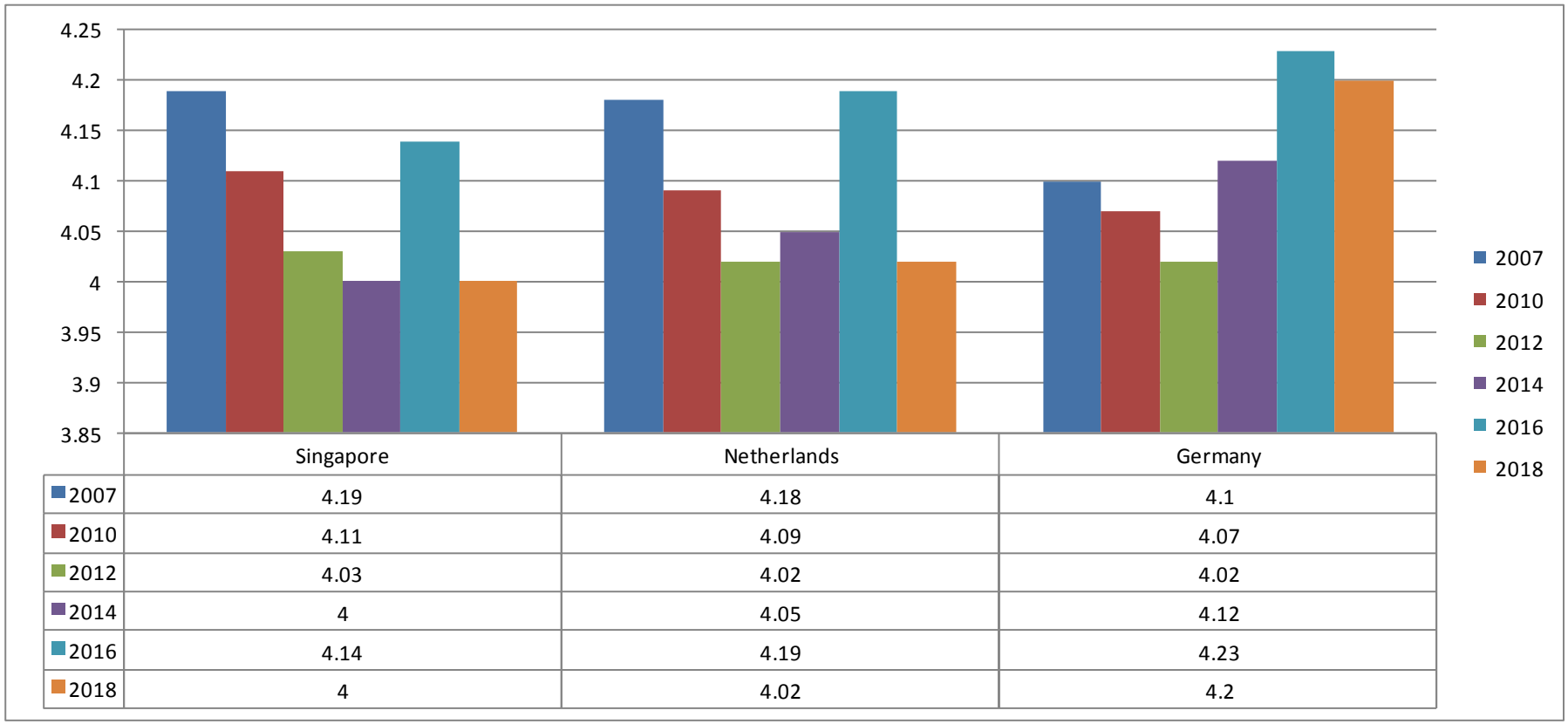
**Figure 4.12: Top 10- Lower performance Score-2018**




| | Madagascar | Bolivia | Guyana | Fiji | Mauritania | Myanmar | Senegal | Sierra Leone | Burundi | Afghanistan |
|---|---|---|---|---|---|---|---|---|---|---|
| Timelines | 2.73 | 2.74 | 2.65 | 2.54 | 2.68 | 2.91 | 2.52 | 2.34 | 2.17 | 2.38 |
| Easy of Tracking | 2.61 | 2.13 | 2.44 | 2.31 | 2.47 | 2.2 | 2.11 | 2.27 | 2.01 | 1.7 |
| Logistic service | 2.33 | 2.21 | 2.24 | 2.31 | 2.19 | 2.28 | 2.11 | 2 | 2.33 | 1.92 |
| Easy of shipement | 2.19 | 2.54 | 2.17 | 2.16 | 2.19 | 2.2 | 2.36 | 2.18 | 2.21 | 2.1 |
| Infrastructure | 2.16 | 2.15 | 2.09 | 2.4 | 2.26 | 1.99 | 2.22 | 1.82 | 1.95 | 1.81 |
| Custom | 2.32 | 2.32 | 2.55 | 2.41 | 2.2 | 2.17 | 2.17 | 1.82 | 1.69 | 1.73 |
| Overall LPI | 2.39 | 2.36 | 2.36 | 2.35 | 2.33 | 2.3 | 2.25 | 2.08 | 2.06 | 1.95 |

Source ; world bank report 2018

Fig.4.13: **Competition of top ranked countries (2007-2018).**




| | Singapore | Netherlands | Germany |
|---|---|---|---|
| 2007 | 4.19 | 4.18 | 4.1 |
| 2010 | 4.11 | 4.09 | 4.07 |
| 2012 | 4.03 | 4.02 | 4.02 |
| 2014 | 4 | 4.05 | 4.12 |
| 2016 | 4.14 | 4.19 | 4.23 |
| 2018 | 4 | 4.02 | 4.2 |

Source: world bank LPI report (2007- 2018).

The overall score profile of the entire set of those three countries has exists in competitive market from 2007 – 2018 of World Bank report, an indication of the robust nature of underlying data exhibited. The countries perceived improvement in the trade-supporting infrastructure among high-income countries and, to maximum extent, in their logistics services and customs and border management. As the trend analysis and figure above of LPI (2007-2018) illustrated, over the past several years, high-income countries, most of which are in Europe, occupied the top 10 positions in the LPI rankings. Surprising, since these countries traditionally have been dominant in the supply chain industry. From the High-income countries competitions that occupied by the top 10 of the world ranks and, three of them highly compete to keep the top-10 position since 2018 consiquativly, and also two of them (Netherlands and Germany) are from Europe and Singapore from Asian . these implies that those countries Singapore, Germany and Netherlands give attentions to Logistics performance and quality of service, these leads to positively impacts on countries economy. From the lower performing economies no one can keep to stay at the lower position for the continuative year of 2007-2018.

## 4.3. The relationship between freight transport service and global competitiveness

To evaluate the association between international trade and logistic service implication on the global competitiveness, the researcher uses LPI and GCI indexes. The 6 years survey data were used with two years intervals from 2007 up to 2018. The data were collected by World Bank and its agent organization using online structured survey. Both the LPI and GCI survey uses standardized questionnaire which comprises domestic and international parts. So, those international organizations use these indexes for comparing once country trade and logistic performance with the others. Therefore, this study also used those indexes in order to compare and contrast the relationship between international trade and logistic services.

A correlation analysis was used to examine the relationships and strengthens between LPI and GCI indexes. Accordingly, as the result illustrated most of the serious years LPI and GCI indexes are linearly associated except 2016 result; because their p-values lower that the corresponding significant threshold 0.05. Regarding the strangeness of the association, as the index comparison indicated starting from 2007 up to 2014 both the logistic and trade develop a strong positive association, because the correlation coefficients of the selected indexes are above 0.7.This implies, tread and logistic services had developed a strong association during those indicated times.

However, during 2016 the two indicators loses their relationship and in the next resent year, 2018, developed a weak negative association. This mean, i.e., if the logistic performance increases the trade performance will drowned back. These implies during 2016 logistic activity and trade loses their association at all; whereas, in 2018 the trade activity inversely affected by logistic correspondent, these indicates that, as global competitiveness does not only depends on logistics performance factors, but also other factors such as, supply chains complex systems with its complex processes, services in business, regulations constraints, politics, trade restriction. Investment climate, perceptions of enterprises and policymaker, financial constraints and other problems like bilateral and regional trade agreements that affect tariffs and increase documentation, might have been the reason that causes the negative relationship between Logistic Performance and Global competitiveness. The logistics performance is positively impacted by the management strategy of the supply chain and a direct impact on marketing performance, which in turn influences the financial performance (Green *et al.* 2008).

**Table.4.1: Pearson correlation matrix**

| Year | | GCI |
|---|---|---|
| 2018 | LPI | -0.314** |
| | Sig. | 0.003 |
| 2016 | LPI | -0.073 |
| | Sig. | 0.497 |
| 2014 | LPI | 0.794** |
| | Sig. | 0.000 |
| 2012 | LPI | 0.864** |
| | Sig. | 0.000 |
| 2010 | LPI | 0.887** |
| | Sig. | 0.000 |
| 2007 | LPI | 0.884** |
| | Sig. | 0.000 |

Source: Model estimation

## 4.4. Estimation of the Econometric Trade Model

### 4.4.1. The determinants of freight transport service on international trade performance within the top-ten upper countries.

As the researcher tried to indicate in the method of the proposal, gravity model was widely used to measure the trade potential and to judge the effect of trade. Moreover, it was also used to analyze the trade pattern, estimate the marginal cost of trade barrier, and explain the economic phenomena in reality. Hence, gravity model is applied to measure trade in services international competition as a new index. Taking this consideration into account, the study used the analyses of this method in order to determine the bilateral trade flows, the goal being the development of more precise predictions on the bilateral trade. To do so, the study take the resent the top 10 highest LPI scorer countries in one hand and the bottom 10 lower LPI scorer during 20018 in other hand. The gravity model is built based on the major factor impacting the total trade in services such as GDP, Time line, Distance between bilateral countries, infrastructure, and Land locked.

The log linear regression (gravity) model was conducted to examine the causal and strengthens of a relationship between the exporter trades with partner countries of the world. In the model the parameters were estimated using Ordinary Least Squares (OLS) method, and for the selection of the regression variables was used the stepwise method. The basic idea of stepwise regression is "Inclusion or Exclusion". That is the approach used to select variables one by one based on sum of the square of argument regression. Involve argument one by one in the regression model and test them for statistical significance, delete any that are not significant. Methods are a combination of the above, testing at each stage for variables to be included or excluded.

Basically, the regression analysis is used to test how the model fits and investigate the determinant variables from the given explanatory variables. Finally, the research questions got their proper answer based on the proposed specific objectives and the regression output results. The study before giving more explanation about the determinant factors, primarily, has to test which stage of the formulated model fitted. Therefore, the ANOVA results, indicated that the models explained significant variation in bilateral trade flows, based on factors included in the model (Sig. <0.05).

As the result illustrated in the table below, the F-test of the entered countries p-values were below the significant value (0.05) with different stages. Hence, the significance (sig.) value is greater than

that of the p-value; therefore, there is full evidence that the model is fitted or good with different level. For instance the German trade were found with the lowest residual error in the fourth model (Regression df=4), Netherland in the third (Regression df=3), Belgium in the third (Regression df=3) etc

**Table4.2:** Model specification (ANOVA)

| **Countries** | **Model** | **SSS** | **Df** | **MS** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| Germany | Regression | 23.432 | 4 | 5.858 | 16.894 | 0.000 |
| | Residual | 11.789 | 34 | 0.347 | | |
| | Total | 35.221 | 38 | | | |
| Netherland | Regression | 27.340 | 3 | 9.113 | 16.480 | 0.000 |
| | Residual | 21.566 | 39 | 0.553 | | |
| | Total | 48.906 | 42 | | | |
| Belgium | Regression | 47.374 | 3 | 15.791 | 35.639 | 0.000 |
| | Residual | 16.838 | 38 | 0.443 | | |
| | Total | 64.212 | 41 | | | |
| UK | Regression | 60.270 | 2 | 30.135 | 41.596 | 0.000 |
| | Residual | 30.428 | 42 | 0.724 | | |
| | Total | 90.697 | 44 | | | |
| Singapore | Regression | 9.666 | 1 | 9.666 | 4.469 | 0.040 |
| | Residual | 90.836 | 42 | 2.163 | | |
| | Total | 100.502 | 43 | | | |
| Sweden | Regression | 7.921 | 1 | 7.921 | 8.712 | 0.006 |
| | Residual | 30.005 | 33 | 0.909 | | |
| | Total | 37.927 | 34 | | | |
| Norway | Regression | 44.321 | 3 | 14.774 | 15.469 | 0.000 |
| | Residual | 35.338 | 37 | 0.955 | | |
| | Total | 79.659 | 40 | | | |
| Luxembourg | Regression | 28.338 | 2 | 14.169 | 11.842 | 0.000 |
| | Residual | 49.058 | 41 | 1.197 | | |
| | Total | 77.396 | 43 | | | |
| US | Regression | 18.770 | 1 | 18.770 | 25.219 | 0.000 |
| | Residual | 29.771 | 40 | 0.744 | | |
| | Total | 48.541 | 41 | | | |
| Japan | Regression | 19.598 | 2 | 9.799 | 9.859 | 0.000 |
| | Residual | 36.776 | 37 | 0.994 | | |
| | Total | 56.374 | 39 | | | |

Source: Model estimation

Having the above concept in mind, the next question which follows would be how much is the model good. The answer is given by the goodness of fit test ($R^2$) value. That is, the value of R square used to measure how much of the variation in the dependent variable, bilateral trade flow, identified by the regressors. The larger the value of R square, the better it fits.

So, table.4.2.displays R, R square, adjusted R square, and the standard error of the estimate. R is the multi-correlation coefficient which is measuring the relationship between the dependent and predictor variables. The values of R range from -1 to 1. The sign of R indicates the direction of the

relationship (positive or negative). The absolute value of R indicates the strength, with larger absolute values indicating stronger linier relationship.

The coefficient (R square) helps to quantify the proportion of variation in the dependent variable explained by the regression model. It is ranged from 0 to 1. Small values indicate that the explainable level of the independent variables to determine the dependent variable is weak. The sample R squared tends to optimistically estimate how well the models fit for the population. Both R squared and adjusted R square somehow has the same meaning and purpose. But, adjusted R square is applicable for the small numbers of observation (n<30) or numbers of variables (No. of variable <5) (Julie, 2011). So, in the case of this study, the researcher used R square, because the size of the data seat as well the number of variables full filed the above criteria.

Therefore, as shown in the table below the R square results of each final model were indicated; their result lay between 0.096 and 0.738. For example, the R square of Belgium bilateral trade flows with the models based on all the regression factors is 0.738. This means, the chosen model explains 73.8% of the variation of the dependent variable, the bilateral trade flow between Belgium and partner countries. Likewise, the bilateral trade flow between partner countries and Germany is 66.5%, UK 66.5%, Netherland 55.9%, and Norway 55.6% of the variation covered by the inclusive factors in the fitted model; whereas, the R square values of Singapore bilateral trade flow with other partners is 0.096, i.e., 9.6% of the variation of the dependent variable explained by the considered factors in the fitted model. The below table illustrated more about the goodness of fit test of model what is considered by all the conserved countries (Table-.4.3).

**Table.4.3:** Goodness of fit test

| Country | R | R square | Adj. R Square | Std. Error of the estimate |
|---|---|---|---|---|
| Germany | 0.816 | 0.665 | 0.626 | 0.5885 |
| Netherland | 0.748 | 0.559 | 0.525 | 0.7436 |
| Belgium | 0.859 | 0.738 | 0.717 | 0.3354 |
| UK | 0.815 | 0.665 | 0.649 | 0.8512 |
| Singapore | 0.310 | 0.096 | 0.075 | 1.4706 |
| Sweden | 0.457 | 0.209 | 0.185 | 0.9536 |
| Norway | 0.746 | 0.556 | 0.520 | 0.9773 |
| Luxembourg | 0.605 | 0.366 | 0.335 | 1.0939 |
| US | 0.622 | 0.387 | 0.371 | 0.8627 |
| Japan | 0.590 | 0.348 | 0.312 | 0.9970 |

Source: Model estimation

Result of regression analysis presented in table below also provides more comprehensive and accurate examination of the research questions. Therefore, the regression analysis is used to test the

developed questions based on the specific objectives and investigate the contributions of the independent variables over the dependent once.

1. **Germany**

The variables which have influence on Germen's bilateral trade are: distance between Germen and partner country, GDP of the partner countries, time line and land locked. However, infrastructure did not have an influence on bilateral trade because of insignificant coefficients.

According to the study finding, Germany tends to have trade relations with countries where their total GDP is higher. The estimated coefficient of this variable has statistical significance and show positive influences, in line with expectations when constructing the model. After taking the remaining effect as a constant, for a 1% increment of partners GDP would lead to enhance trade value by approximately 0.572%. In other term, Germany has more intense external trade with countries that have a better GDP than with the countries with lower GDP. The researcher argument confirmed that, the previous results of, Önsel *et al.* (2008) and Ülengin *et al*. (2002) , are the same as these results.

Geographical distance is statistically significant and estimated to impair bilateral trade between Germany and partners. That is, with an increase by 1% of distance, the trade value would decrease by 0.353% on average. So, the negative correlation between bilateral trade flow and the geographical distance shows that the greater the distance between Germany and the partner country, the lower is the trade volume between the two. Based on the researcher empirical study and the output of the arguments also the same as empirical results as of Hausman *et al* (2012) results.

The study finding also indicated that time line of reaching and loading off had positive impact on trade flows between Germany and a trade partner. This means, when the time line between Germany and partners improved the tread relation also go with the same line. For instance if the time line improved with 1% after taking the other effect as a constant the trade flow of Germany would be elongated by 3.037%. This implies Germen has a better relation with the countries which have good time management. Based on the researcher empirical study, the output of the arguments seems to the works of, Önsel *et al.* (2008) Akomolafe (2013) and Raballand *et al.* (2012) also, argue there is a proven link between the storage rate level and the dwell time of cargo as well as port congestion,

In addition land locked is significant effect for the bilateral trade of Germany and its partners. Accordingly the bilateral trade flow and land locked shows that German has more intensified trade

activities with countries which had a port than countries those are land locked. The researchers result confirmed that, the previous results of, an empirical analysis by Raballand (2003) and Arvis *et al.* (2010) , are the same as these results.

**2. Netherland**

Time line, GDP and distance are significant important factors to determine the bilateral trade flow of the Netherland. That is, this country trade flow would escalate, if the duration of trade distribution improves. After controlling the remaining effect as a constant, for a 1% change in time line, the bilateral trade flow of Netherland with its partners would lead to increase 3.707% times. Based on the researcher empirical study, the output of the results seems to the works of, Önsel *et al.* (2008) Akomolafe (2013) and Raballand *et al.* (2012) also, argue there is a proven link between the storage rate level and the dwell time of cargo as well as port congestion,

Netherland has more intense external trade with countries that have higher GDP than with the countries with lower GDP. For a 1% increment of partners GDP would enlarge 32.8% increment of trade flow of Netherland. The researcher argument confirmed that, the previous results of, Önsel *et al.* (2008) and Ülengin *et al.* (2002), are the same as these results.

Contrarily, the geographical distance has inverse association with the trade flow. This implies, for a 1% increment of distance, the trade value would lead to decline 0.291%. In other words, the greater the distance between Netherland and the partner country, the lower is the trade volume between the two. As the researcher compare and contrast, the output is identical as to Hausman *et al* (2012) results

**3. Belgium**

The bilateral trade flow of Belgium and its partners depending on GDP, distance and infrastructure. For instance, a 1 % increase of GDP, would lead to escalate 0.64% of the trade value. This implies Belgium has more intense external trade with countries that have higher GDP. The researcher argument confirmed that, the previous results of, Önsel *et al.* (2008) and Ülengin *et al.* (2002), are the same as these results.

Likewise, as the result illustrated if the infrastructure of the partner country increases by 1%, the bilateral trade value of Belgium would step up by roughly 1.956%. That is the Belgium mostly attracted by the infrastructure development of the partner countries for the bilateral trade flows. As

we compare the results with authors empirical evidence; the argument has the same as. Arellano and Bover (1995), they find strong positive effects of infrastructure on growth.

However, distance is negatively affected the bilateral trade flow of Belgium and its partners. In that regard for a 1% increment of geographical distance would lead to decrease 0.528% of the trade value. In other word the greater the distance between Belgium and the partner country, the lower is the trade volume within them. From the empirical information, the output is identical as to Hausman et al (2012) results

**4. UK**

Infrastructure and GDP's are highly statistically significant to determine the bilateral trade between UK and its partner's countries on the trade flow. If the infrastructure of the partner countries increases by 1%, the bilateral trade value of UK would intensify by roughly 3.617%. That is UK has more strengthened trade activities with countries that had better infrastructure facilitation, compared to countries with low infrastructure. As we compare the results with authors empirical evidence; the argument has the same as. Arellano and Bover (1995), they find strong positive effects of infrastructure on growth.

Moreover, the GDP is significant important to determine the bilateral trade flow of UK and its partners, i.e., UK has more strengthened trade activities with countries that had more GDP, compared to countries with low growth domestic product. Also these results are supported by, Önsel *et al.* (2008) and Ülengin *et al.* (2002) previous finding.

**5. Singapore**

Singapore's trade flow is highly emphasized on the geographical distance only. Hint, geographical distance is statistically significant and estimated to impair bilateral trade between Singapore and partners. With an increase by 1% of distance, the trade value would decrease by 0.438%. This indicates when the country distance with its partner wider, the possibility of reaching would be declined. These arguments also the same as empirical results as of Hausman *et al* (2012) results.

### 6. Sweden

As like Singapore, Sweden's trade flow with partners would under consider geographical distance. As the study finding illustrated, the bilateral trade flow and the geographical distance developed negative association. So, the greater the distance between Sweden and the partner country, the lower is the trade volume between the two. These arguments also the same as empirical results as of Hausman *et al* (2012) results.

### 7. Norway

In here also the bilateral trade flows are explained by infrastructure, GDP, and the distance between Norway and its partner countries. The infrastructure status of the partner countries play a significant role for the Norway trade flow chose. Accordingly, if the infrastructures of the partner countries increased by 1% the Norway trade flow chose would also elongated by 3.248%. That is, Norway has a bigger trade volume with countries having a better infrastructure. As we compare the results with authors empirical evidence; the argument has the same as. Arellano and Bover (1995), they find strong positive effects of infrastructure on growth.

Likewise, the GDP of the partner countries play a significant role to work with Norway. This mean, when the growth domestic product of the partners' country escalating by 1% the Norway intense of trade relation with them would escalate by 0.199%. In other word, Norway has powerful external trade with countries that have higher GDP than with lowest. The researcher argument confirms the previous results, of Önsel *et al.* (2008) and Ülengin *et al.* (2002) are the same as these results.

Regarding the geographical distance, impairs bilateral trade between Norway and partners indicate invers association. If the partner countries distance increase by 1%, the trade value of Norway decrease by 0.352% after taking the other effect as a constant. This mean, the greater the distance between Norway and the partner country, the lower is the trade volume between the two. Confirming that, these empirical results are the same as Hausman *et al* (2012) results.

### 8. Luxemburg

TimeLine and GDP are statistically significant and estimated to impair bilateral trade between Luxemburg and its trade partners. Both of the determinant factors have positive association; i.e., the increment of them leads to increase their trade association.

For instance, if the time line of the partners country improved by 1%, correspondingly Luxemburg's trade volume would rise by 5.146%. In other terms, Luxemburg has made stronger trade activities

with countries that have better port time management, compared to countries with lower time line. Based on the researcher empirical study, the output of the arguments seems to the works of, Önsel *et al.* (2008) Akomolafe (2013) and Raballand *et al.* (2012) also, argue there is a proven link between the storage rate level and the dwell time of cargo as well as port congestion,

Similarly, Luxemburg's trade is affected by its partners GDP. GDP is statistically significant with a positive impact. So, If GDP of the partner country increases by 1%, the bilateral trade flow of Luxemburg would step up by 0.204%. That is, Luxemburg has more intense external trade with countries that have higher GDP than with the countries with lower GDP. The researcher argument confirms the previous results, of Önsel *et al.* (2008) and Ülengin *et al.* (2002) are the same as these results.

**9. US**

GDP is influential in trade flow activities. The bilateral trade between US and partners linked with the consideration of better GDP. That is, the GDP of the partner countries elongated by 1%, the trade value of US would escalate up by 0.521%. In other words, US have powerful external trade with countries that have better GDP. And also these arguments agree with, Önsel *et al.* (2008) finding and Ülengin *et al.* (2002)

**10. Japan**

The study finding also illustrated in the table below that bilateral trade flows of Japan are explained by infrastructure and the distance between the bilateral countries. Infrastructure has positive effect on trade flow. The infrastructure statues of partner countries increase by 1%, the trade value would escalate by 29.724%. That is Japan has more intense external trade with countries that have better infrastructure. And these results are seeming to, Arellano and Bover (1995) they find strong positive effects of infrastructure on growth

Moreover, geographical distance is statistically significant and important to impair bilateral trade between Japan and partners. This impels, if the distance increase by 1%, the trade flow of Japan would decrease by 1.165%. The negative correlation between bilateral trade flow and the geographical distance indicated that the greater the distance between Japan and the partner country, the lower is the trade volume between the two. The individual inclusive countries details are shown in below: And finally, these empirical results are the same as Hausman *et al* (2012) results.

**Table 4.4:** Estimate of trade flow between the given countries with their partners

| Countries | Model | Unstandardized coefficient | | Standardized coefficient | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| **Germany** | Constant | 18.594 | 1.742 | | 10.672 | 0.000 |
| | Distance | -0.353 | 0.088 | -0.438 | -4.033 | 0.000 |
| | GDP | 0.572 | 0.081 | 0.822 | 7.105 | 0.000 |
| | Time line | 3.037 | 1.117 | 0.279 | 2.719 | 0.010 |
| | Land locked | 0.811 | 0.345 | 0.259 | 2.347 | 0.025 |
| **Netherland** | Constant | 17.42 | 1.992 | | 8.744 | 0.000 |
| | Time line | 3.707 | 1.264 | 0.339 | 2.932 | 0.006 |
| | GDP | 0.328 | 0.074 | 0.500 | 4.414 | 0.000 |
| | Distance | -0.291 | 0.099 | -0.336 | -2.937 | 0.006 |
| **Belgium** | Constant | 19.584 | 1.012 | | 19.334 | 0.000 |
| | GDP | 0.640 | 0.096 | 0.643 | 6.631 | 0.000 |
| | Distance | -0.528 | 0.085 | -0.552 | -6.242 | 0.000 |
| | Infrastructure | 1.956 | 0.679 | 0.267 | 2.880 | 0.007 |
| **UK** | Constant | 14.563 | 0.832 | | 17.502 | 0.000 |
| | Infrastructure | 3.617 | 0.774 | 0.489 | 4.671 | 0.000 |
| | GDP | 0.427 | 0.100 | 0.445 | 4.255 | 0.000 |
| **Singapore** | Constant | 25.506 | 1.809 | | 14.097 | 0.000 |
| | Distance | -0.438 | 0.207 | -0.610 | -2.114 | 0.040 |
| **Sweden** | Constant | 14.847 | 2.269 | | 6.545 | 0.000 |
| | Distance | -4.899 | 1.660 | -0.457 | -2.952 | 0.006 |
| **Norway** | Constant | 17.962 | 1.451 | | 12.379 | 0.000 |
| | Infrastructure | 3.248 | 0.898 | 0.441 | 3.616 | 0.001 |
| | Distance | -0.352 | 0.117 | -0.331 | -3.006 | 0.005 |
| | GDP | 0.199 | 0.080 | 0.302 | 2.483 | 0.018 |
| **Luxembourg** | Constant | 10.140 | 1.967 | | 5.155 | 0.000 |
| | Time | 5.146 | 1.538 | 0.439 | 3.347 | 0.002 |
| | GDP | 0.204 | 0.089 | 0.299 | 2.282 | 0.028 |
| **US** | Constant | 20.196 | 0.678 | | 29.796 | 0.000 |
| | GDP | 0.521 | 0.104 | 0.622 | 5.022 | 0.000 |
| **Japan** | Constant | 29.724 | 2.828 | | 10.511 | 0.000 |
| | Distance | -1.165 | 0.288 | -0.540 | -4.047 | 0.000 |
| | Infrastructure | 2.588 | 1.165 | 0.297 | 2.222 | 0.032 |

Source: Model estimation

## 4.4.2. The determinants of freight transport service on international trade performance within the top-ten lower countries

In this portion the study took the bottom lower 2017 LPI scorers countries for examination. In here the regression estimation also has carried out based on the research equations. It was governed by the gravity model which is denoted in the model specification in chapter three. The result shows how the

study explanatory variables affect export value in bilateral trade flows. The independent variables those included in this study were geographical distance, GDP, time line, infrastructure, and land locked.

But, due to poor computability of these countries some of them, Guili, Burundi, Afghanistan, Senegal, Myanmar, and Mauritania could not fit with the dependent variable, bilateral trade value. Some of the data shows grate variation, whereas, some others moving with the same line. Both have a problem to formulate the model. Even the poor model formulated by using the data, the user supposed to reach in a wrong conclusion. Therefore, the researcher was supposing to take only some of competent countries lowest LPI countries those capable to full file the model specification.

The analysis of the data presented in Table.4.5, ANOVA results, shows that the models explained significant variation in bilateral trade flows, based on factors included in the model (Sig. <0.05), but the result indicated the lowest residual error model, the one that, consequently, has the highest goodness of fit value. In the other hand, the F test is highly statistically significant, which means the regression model is fitted to the data. Thus, the study explanatory variables statistically significantly predict the flow of trade from country i to j.

As the findings of the study illustrated Fiji, Madagascar and Sierra Leone bilateral trade included in the first model, whereas, Bolivia include the second stage model with the minimal error. The F-test of the p-value found between 0.001 and 0.017 and the significant value is 0.05. Hence, the significance (sig.) value is greater than that of the p-value; therefore, accept the statement which is stated that the model is fitted.

**Table.4.5:** Model specification (ANOVA)

| **Countries** | **Model** | **SSS** | **df** | **MS** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| Fiji | Regression | 75.555 | 1 | 75.555 | 6.292 | 0.017 |
| | Residual | 384.236 | 32 | 12.007 | | |
| | Total | 459.791 | 33 | | | |
| Bolivia | Regression | 102.880 | 2 | 51.440 | 5.952 | 0.007 |
| | Residual | 241.979 | 28 | 8.642 | | |
| | Total | 344.859 | 30 | | | |
| Madagascar | Regression | 104.727 | 1 | 104.727 | 12.617 | 0.001 |
| | Residual | 215.814 | 26 | 8.301 | | |
| | Total | 320.541 | 27 | | | |
| Sierra Leone | Regression | 68.819 | 1 | 68.819 | 6.557 | 0.014 |
| | Residual | 461.805 | 44 | 10.496 | | |
| | Total | 530.624 | 45 | | | |

Source: Model estimation

The gravity model estimation result, which indicated in the table below, illustrated that the summary statistics of Fiji R-square, 0.164. This means that the model explanatory variables explains 16.4% of the observed variations in bilateral export value from Fiji to the rest of the world. Comparably, the Sierra Leone goodness of fit test is leaser than Bolivia's model to explain trade flows of the lower LPI countries to global market. This indicates the independent variables ability to explain the trade flow of Bolivia is a bit well. Here anyone can understand that the largest the R square, the better the fit is. Basically, Madagascar's bilateral flow trade explained 32.7% by the included factor, infrastructure (Table.4.6).

**Table.4.6:** Goodness of fit test

| Country | R | R square | Adj. R Square | Std. Error of the estimate |
|---|---|---|---|---|
| Fiji | 0.405 | 0.164 | 0.138 | 3.46517 |
| Bolivia | 0.546 | 0.298 | 0.248 | 2.93974 |
| Madagascar | 0.572 | 0.327 | 0.301 | 2.88107 |
| Sierra Leone | 0.360 | 0.130 | 0.110 | 3.23969 |

Source: Model estimation

The regression model which indicated in the below table shows every of the listed countries estimates for the dependent variables which is export value (Trade) and gravity model variables that include bilateral distance, exporter GDP, infrastructure, time line, and land lock; whereas, the estimated determinant for the study key variables such as GDP, infrastructure and geographical distance. The individual inclusive countries details are shown as follow:

1. **Fiji**

Evidence on the effect of trade logistics performance on Fiji trade has secured, under the dimension of GDP. Having this, estimation has made for each of LPI components based on the research equations. The study explanatory variables coefficients with their significance level have summarized in the table below.

According to the study findings GDP of the importer countries have statistically significant positive effects on bilateral trade flows as expected, with coefficient 0.774. This indicates for a 1% increment in GDP would tend to upsurge bilateral tread of Fiji by 0.774%. This installs Fiji has more intense external trade with countries that have higher GDP than with the countries with lower GDP.

## 2. Bolivia

In studying the effect of bilateral trade flow on Bolivia, variables such as GDP and geographical distance are statistically significant with a 0.05 level of significance. The estimation result of this study gravity model with interaction effect has presented in the table below.

In terms of economic size, GDP have significant positive effect on bilateral trade flows of Bolivia. As the result reviled for a 1% increase in GDP will tend to increase export value by 0.780 % after controlling the remaining effect as a constant. This indicates Bolivia export its product for the highest GDP countries rather than lowest.

In other direction, geographical distance negative impacted on the bilateral trade flows of Bolivia. This shows bilateral trade is inversely proportional to distance. This means after controlling the other effect as a constant for a 1% increase in bilateral distance between Bolivia and partners will reduce trade by 1.034%. This implies that countries with longer geographical distance with Bolivia will have low trade interaction.

## 3. Madagascar

Madagascar's trade is affected by the infrastructure development of the partner countries. This facture is statistically significant with a positive impact. So, if the infrastructure of the partners' country increases by 1%, the bilateral trade value of Madagascar will step up by roughly 7.505%. This implies Madagascar has a bigger trade volume with countries having a better infrastructure development. Therefore, positive effect of infrastructure on bilateral trade is strongly supported in the case of Madagascar.

## 4. Sierra Leone

The study findings also confirmed that GDP is statistically significant and estimated to impair bilateral trade between Sierra Lion and partners. That is, when the GDP of the partner countries increase by 1% bilateral trade of Sierra Lion will increase by 0.518%. This implies, Sierra Lion will share trade mostly with countries with bigger economic size. In other term, it has more intense external trade with countries that have higher GDP than others.

**Table.4.7:** Estimate of trade flow between the given countries with their partners

| Countries | Model | Unstandardized coefficient | | Standardized coefficient | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | T | Sig. |
| Fiji | Constant | 1.818 | 1.898 | | 0.958 | 0.345 |
| | GDP | 0.774 | 0.308 | 0.405 | 2.508 | 0.017 |
| Bolivia | Constant | 12.120 | 4.697 | | 2.581 | 0.015 |
| | GDP | 0.780 | 0.263 | 0.473 | 2.970 | 0.006 |
| | Distance | -1.034 | 0.497 | -0.331 | -2.079 | 0.047 |
| Madagascar | Constant | -1.407 | 2.510 | | -0.561 | 0.580 |
| | Infrastructure | 7.505 | 2.113 | 0.572 | 3.552 | 0.001 |
| Sierra Leone | Constant | 8.755 | 1.249 | | 7.012 | 0.000 |
| | GDP | 0.518 | 0.202 | 0.360 | 2.561 | 0.014 |

Source: Model estimation

## 4.5. The extent of international trade competitiveness in service for top-ten upper and top-ten lower countries.

There are different indexing systems which help to test international trade competitiveness. Commonly, reviewing the studies of trade competition, three indexes are usually applied. One is Revealed Comparative Advantage Indices (RCA), the other is Trade Special Coefficient (TSC) and the third once is bilateral tread error series. In this study the researcher used bilateral tread error series.

To determine the degree of trade efficiency or inefficiency, the researcher calculated, for the error series, the one standard deviation interval around the mean, which is (-1, +1). If the error values are outside the range, then for positive values there is a high efficiency of bilateral trade; whereas, for negative values there is a highly inefficient trade (Elena-Daniela, 2012).

To analyze the efficiency of the listed top 10 and bottom 4 LPI scorer countries bilateral trade with their partner countries, as the literature suggested as the above the researcher have analyzed the model error series that resulted from estimating the trade model. Accordingly, negative error values indicate that the real value of the bilateral trade flow is below the estimated one; whilst, positive error values indicate the real value is greater than the estimated value. The working hypothesis is that negative error values indicate an inefficient trade or uncompetitive, which has not reached its potential; but, positive error value show an effective trade or competitive, above the theoretical potential.

Taking the above consideration into account, this study examined and executed, from the individual top as well bottom LPI scorer countries, few bests competitive and few uncompetitive trade partner and list in the table below.

As the study reveled in the table below most of the selected countries developed various kinds of trade association with their partners. The researcher specified the partners' country as per their level of efficient trade assistance with the domain country. For example, regarding the area, Germany has the most efficient bilateral trade with EU and Asian countries. Some of the European partners deploying ineffective trade relations with Germany, for instance Luxemburg have a very inefficient tread relation; so, their trade association is not competitive.

Likewise, Netherland, Belgium and UK have the most efficient bilateral trade with the EU countries. However Singapore and Sweden have best tread link with the Middle Asia and African country. Moreover, Norway, Luxemburg and U.S have highest trade link with EU, Asian and Southern American countries. In contrast Sweden and Luxemburg are the most ineffective trade partnerships with Netherland. Latvia and Japan are also had a very weak trade link with Belgium.

Most of the African countries except Nigeria and South Africa did not have any trade link with the most top LPI scored countries. Even South Africa have inefficient trade link with Sweden. Amicably, Nigeria have highly efficient bilateral trade link with Belgium.

As the above topics illustrated most of the highest LPI scorer countries in 2018 were European countries. According to this study finding those countries usually have an effective market link with themselves as well with the Asian countries mostly. These indicated that the countries mostly competent and better trade link with themselves or with the inpouring continents. The below table illustrated more about the global trade link effectiveness of higher LPI scorer countries (Table 4.8).

Table.4.8: Some trade competent partners of high LPI scorer countries

| **Germany** | | **Netherland** | | **Belgium** | |
|---|---|---|---|---|---|
| **Countries** | **Competitiveness** | **Countries** | **Competitiveness** | **Countries** | **Competitiveness** |
| Luxembourg | Highly incompetent | Sweden | Highly incompetent | Latvia | Highly incompetent |
| Japan | Incompetent | Luxembourg | Highly incompetent | Japan | Highly incompetent |
| Norway | Incompetent | Thailand | Incompetent | Norway | Incompetent |
| Canada | Incompetent | Japan | Incompetent | Mexico | Incompetent |

| | | | | | |
|---|---|---|---|---|---|
| Hungary | Competent | Mexico | Incompetent | Austria | Incompetent |
| South Korea | Competent | Turkey | Competent | Poland | Competent |
| Slovakia | Competent | Czech | Competent | India | Competent |
| Czech | Competent | Hungary | Competent | U.A.E | Competent |
| Island | Highly competent | Belgium | Highly competent | Nigeria | Highly competent |
| Australia | Highly competent | Germany | Highly competent | Germany | Highly competent |
| **UK** | | **Singapore** | | **Sweden** | |
| Taiwan | Highly incompetent | Pakis | Highly incompetent | Ireland | Highly incompetent |
| Austria | Highly incompetent | Italy | Highly incompetent | Hungary | Highly incompetent |
| Check Republic | Incompetent | Bahamas | Incompetent | South Africa | Incompetent |
| Finland | Incompetent | Canada | Incompetent | Austria | Incompetent |
| Slovakia | Incompetent | Spain | Incompetent | Czech | Incompetent |
| Germany | Competent | Philippines | Competent | Russia | Competent |
| Netherland | Competent | Belgium | Competent | Netherland | Competent |
| Belgium | Competent | German | Competent | UK | Competent |
| Switzerland | Highly competent | Thailand | Highly competent | Finland | Highly competent |
| Island | Highly competent | Vietnam | Highly competent | China | Highly competent |
| **Norway** | | **Luxemburg** | | **US** | |
| Israel | Highly incompetent | Japan | Highly incompetent | Qatar | Highly incompetent |
| Austria | Highly incompetent | Israel | Highly incompetent | Egypt | Highly incompetent |
| Spain | Incompetent | Finland | Incompetent | Norway | Incompetent |
| Singapore | Incompetent | Lithuania | Incompetent | South | Incompetent |
| Oman | Incompetent | India | Incompetent | New Zealand | Incompetent |
| Portugal | Competent | Austria | Competent | Nether | Competent |
| Denmark | Competent | UK | Competent | Guatemala | Competent |
| Poland | Competent | Switzerland | Competent | Singapore | Competent |
| US | Highly competent | Russia | Highly competent | Honk Kong | Highly competent |
| Belgium | Highly competent | Italy | Highly competent | Columbia | Highly competent |
| | | | | | |
| **Japan** | | | | | |
| Hungary | Highly incompetent | | | | |
| South Africa | Highly incompetent | | | | |
| New Zealand | Incompetent | | | | |
| Kuwait | Incompetent | | | | |
| Israel | Incompetent | | | | |
| Singapore | Competent | | | | |
| India | Competent | | | | |
| Malaysia | Competent | | | | |
| Mexico | Competent | | | | |
| Canada | Competent | | | | |

Source: Model estimation

As like the most top LPI scorers, low scorers countries also have effective or ineffective tread link with their partner countries. For instance Fiji has most effective trade partner link with Canada,

Dominica, China and India. Likewise, Bolivia's most effective partnerships are with Australia and Cyprus; whereas, it has highly ineffective trade link with Spain and India.

Moreover, Madagascar has the most efficient bilateral trade with EU countries like Chile and UK. But, Sierra Leone has well trade link with African countries.

Even if these lower LPI scorer countries have effective trade link with some partner, it is not effective enough for their growth. In addition to that most of their partners are come from the developing nations like Asia, South America and Africa (Table. 4.9).

Table.4.9: Some trade competent partners of low LPI scorer countries

| **Fiji** | | **Bolivia** | | **Madagascar** | |
|---|---|---|---|---|---|
| **Countries** | **Competitiveness** | **Countries** | **Competitiveness** | **Countries** | **Competitiveness** |
| Czech Republic | Highly incompetent | Spain | Highly incompetent | Australia | Highly incompetent |
| Belgium | Highly incompetent | India | Highly incompetent | Argentina | Highly incompetent |
| Argentina | Incompetent | Liberia | Incompetent | Brazil | Incompetent |
| Chile | Incompetent | Israel | Incompetent | Finland | Incompetent |
| Iraq | Incompetent | Argentina | Incompetent | Bahrain | Incompetent |
| France | Competent | China | Competent | Egypt | Competent |
| Canada | Highly competent | Ireland | Competent | Eritrea | Competent |
| Dominica | Highly competent | Italy | Competent | Burkina | Competent |
| China | Highly competent | Austria | Highly competent | Chile | Highly competent |
| India | Highly competent | Cyprus | Highly competent | UK | Highly competent |
| **Sierra Leone** | | | | | |
| Germany | Highly incompetent | | | | |
| Seychelles | Highly incompetent | | | | |
| Turkey | Incompetent | | | | |
| Kenya | Incompetent | | | | |
| Indonesia | Incompetent | | | | |
| Vietnam | Competent | | | | |
| Bangladesh | Competent | | | | |
| Spain | Competent | | | | |
| The Gambia | Highly competent | | | | |
| South Africa | Highly competent | | | | |

Source: Model estimation

# CHAPTER FIVE

## CONCLUSION

This paper aims to assess the Freight Transport service and international trade with its implications for global competitiveness. The study also provides the following key insights and lessons:

Freight Transport service and international trade are one of the most expedient economic factors in pushing economies to transition and integration. The objectives of this paper has to provide justification based on LPI, GCI trends and Gravity model analysis of bilateral trade flow and the evaluations has been applied on both top-ten high and lower -income performing countries (2007-2018).

Regarding the extent of freight transport service and its implications on the international trade with the consideration of top-ten upper and lower countries, the finding shows that, top-ten countries are devoted to provide maximum efficiency and commitments on the Logistic Performances improvements areas such as physical limitations and capacity constraints. Thus, High efficiency logistics performance resulting to increases the competitive advantage of the countries in terms of marketing performance, economic growth and integration into global markets. European countries are highly dominate on the world trade rank, thus, those countries have a better economic advantages for the world market and highly competitive in the Global market.

Contrarily, the bottom-ten lower performing countries are also illustrated that their trade is inefficient on the area of infrastructures development, customs clearance and border management, competence and quality of logistics services, and timelines and international shipments consecutively. This is because of poor economic efficiency, countries have been loses competitive advantage.

Regarding to the relationship between freight transport service and global competitiveness, both of those factors are statistically significant. Since, starting from 2007 up to 2014 both the logistic performance and global competitiveness develop a strong positive association. Therefore, during those periods tread and logistics moved in the same line. That is, if the logistic performance of the country improved forward, the trade competency also had escalated up.

During 2016 the world logistic activity and tread loses their association at all; whereas, in 2018 the trade activity inversely affected the logistic correspondent, these indicates that, as global

competitiveness does not only depends on logistics performance, but also other factors such as, supply chains complex systems with its complex processes, services in business, regulations constraints, politics, trade restriction, investment climate, perceptions of enterprises and policymaker, financial constraints and other problems like bilateral and regional trade agreements would affect tariffs and increase documentation, might have been the reason that causes the negative relationship between Logistic Performance and Global competitiveness.

Most of the countries trades depend on the size of the economies (GDP), Infrastructure, landlocked, and timelines. But, the geographical distance between bilateral countries is also significant factor negative impact on a country's trade. Therefore, to be trade competent with the highest LPI scorer countries, the partner should full file either of their criteria. For example Germany makes a great trade partner with countries those have a better GDP, time line, land locked and distance.

Concerning to the extent of international trade competitiveness in service, most of the countries developed various kinds of tread association with their partners. From the finding the top 10 upper and lower performing countries usually have an effective market link and also ineffective market link with their partners, based on countries competitive index. Some of the countries develop effective or highly effective link with the partners; whereas, some other develop uncompetitive or strong uncompetitive link with the importer countries. Especially the inefficient trade link with the developing bilateral trade countries, impose insufficient problem for countries and also tempted them to compete in the global world.

Generally, the value of the results of this study is a better understanding of the Freight Transport service and international trade with its implications for global competitiveness and indicates the existing logistics practices and challenges regards to international trade competitiveness

# Recommendation

Based on the findings of the study and conclusions drawn from them, the following possible and reasonable recommendations are suggested for actions to be undertaken by each stakeholder at different levels.

Adopting a new reform and automation on the area of Customs process, police and procedure, helps to accelerate regulatory harmonization with the trade partner's and the implementation of modern techniques with regard to international cooperation, bilateral trade agreements on Police and Customs cooperation and mutual assistance, including protocols on exchanges of pre-shipment information. These techniques help to reduce, the economic disadvantage of low-income countries to overcome, trade barriers.

Based on the research finding, improvement in LPI and GCI will have significant effect at reducing cost of trade flows, to do this the availability of LPI and GCI data for all countries are one of a very problematic. However, further study shall be conducted on the relevance and availability of all countries data to materialize the world information.

For future research studying the logistics practices, complex process ,challenges and expanding the logistics industry's scope i.e. by including, Innovations and Inventions to empower the sectors by adapting R&D. especially lower income countries to give attentions, on the area of transporters Industry and customs office process quality, etc. is recommended.

One of the major disadvantages of LLDCs like ,"**Ethiopian"** face is that they are dependent on the transport networks of neighboring transit countries and have very little influence over the transit transport mode, route, price or management.

In order to control the operation of a system and to overcome the port disadvantages, LLCDs devoted to provide future R&D, on the area of system automation, Innovations on transport industries, Infrastructure development, transport mode selection, port and geography, bilateral trade agreement, tariff and cotaa trade barriers etc.. Are critically recommended.

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Appendix I top-10- upper performing countries competitive data.

| Germany | | Netherland | | Belgium | | UK | |
|---|---|---|---|---|---|---|---|
| Countries | E | Countries | E | Countries | e | Countries | e |
| Luxembourg | -1.11469 | Sweden | -2.00865 | Latvia | -1.2601 | Panama | -1.47081 |
| Japan | -0.84881 | Luxembourg | -1.22275 | Japan | -1.06286 | Mexico | -1.38052 |
| Norway | -0.82328 | Thailand | -0.91574 | Norway | -0.98663 | Japan | -1.25875 |
| Canada | -0.70367 | Japan | -0.85717 | Mexico | -0.93157 | Taiwan | -1.17921 |
| India | -0.63897 | Mexico | -0.71309 | Austria | -0.77442 | Austria | -1.16064 |
| Finland | -0.53827 | India | -0.58282 | South K | -0.76762 | Check Republic | -0.84169 |
| Brazil | -0.49838 | Slovakia | -0.57662 | Sweden | -0.60436 | Finland | -0.69086 |
| Greece | -0.46999 | Swathed | -0.4682 | Ireland | -0.53763 | Slovakia | -0.63404 |
| Denmark | -0.46736 | Portugal | -0.41251 | New Zea | -0.50405 | Australia | -0.6009 |
| Australia | -0.43202 | Denmark | -0.3793 | Denmark | -0.49577 | Belarus | -0.57918 |
| Singapore | -0.34038 | Hong Korea | -0.36156 | China | -0.49149 | Peru | -0.54595 |
| Mexico | -0.32583 | Austral | -0.31834 | Canada | -0.45612 | Serbia | -0.53429 |
| Un, A.b | -0.30783 | Malaysia | -0.31575 | Swithze | -0.40113 | Denmark | -0.48677 |
| Hong Kong | -0.28917 | Bulgari | -0.29491 | Finland | -0.38182 | Thailand | -0.41469 |
| Portugal | -0.26189 | United | -0.27995 | Ghana | -0.31445 | S. Africa | -0.36688 |
| Slovenia | -0.20487 | Finland | -0.24065 | Austral | -0.25257 | Uruguay | -0.25281 |
| Saudi Arabia | -0.20005 | Canada | -0.23971 | US | -0.10642 | S.Koria | -0.21759 |
| Swedin | -0.13389 | Egypt | -0.23208 | South A | -0.04936 | portugal | -0.21683 |
| Malaysia | -0.00977 | Austria | -0.22592 | UK | -0.03166 | quatar | -0.19519 |
| Hungary | 0.02548 | Norway | -0.21377 | Saudi A | -0.02734 | brazil | -0.19463 |
| South Korea | 0.03834 | Brazil | -0.19187 | Singapo | -0.01103 | algeria | -0.07638 |
| Slovakia | 0.09525 | Ireland | -0.18681 | Thailan | 0.0388 | singapore | -0.03943 |
| UK | 0.10065 | South A | -0.15354 | Czechia | 0.04455 | hangary | -0.03902 |
| Rusia | 0.17048 | Romania | -0.12297 | Spain | 0.11852 | Norway | -0.01168 |
| Belgium | 0.18112 | Greece | -0.12123 | Portuga | 0.12104 | malesia | 0.10996 |
| US | 0.23649 | Turkey | 0.09995 | Egypt | 0.14889 | Italy | 0.14784 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Italy | 0.24842 | Czech R | 0.20507 | Greece | 0.16308 | saudiarabi | 0.18272 |
| Spain | 0.2574 | Hungary | 0.22876 | Romania | 0.20236 | China | 0.21012 |
| China | 0.32878 | Rusia | 0.37929 | Hungary | 0.28629 | Russia | 0.2501 |
| South Africa | 0.33446 | South K | 0.38731 | Israel | 0.3498 | Tunisia | 0.25419 |
| Turkey | 0.3401 | China | 0.39037 | Italy | 0.38656 | Indian | 0.2851 |
| Romania | 0.40763 | Singapo | 0.45227 | Hong Ko | 0.41649 | Spain | 0.36794 |
| France | 0.43667 | Israel | 0.4528 | Brazil | 0.44758 | Turkey | 0.39544 |
| Switzerland | 0.46043 | US | 0.56911 | France | 0.45233 | romania | 0.42465 |
| Netherland | 0.59518 | Spain | 0.56974 | Turki | 0.46628 | U arab E | 0.45589 |
| Poland | 0.75957 | Italy | 0.58721 | Netherl | 0.6353 | poland | 0.53135 |
| Czech Republic | 0.99396 | Saudi A | 0.66389 | Luxemab | 0.67262 | Honk Kong | 0.54817 |
| Isiland | 1.14978 | Nigeria | 0.7075 | Poland | 0.76626 | Nigeria | 0.59476 |
| Australia | 1.44891 | Uk | 0.74524 | India | 0.83613 | France | 0.63692 |
| | | Poland | 0.75481 | U.A.E | 0.95269 | US | 0.67007 |
| | | France | 0.87301 | Nigeria | 1.05323 | Germeny | 0.69172 |
| | | Belgium | 1.18979 | Germeny | 1.88956 | Netherland | 0.90019 |
| | | Germeny | 2.37977 | | | Belgiem | 0.92938 |
| | | | | | | Swithzerla | 1.42454 |
| | | | | | | Isiland | 3.37769 |

| Singapore | | Sweden | | Norway | | Luxemburg | |
|---|---|---|---|---|---|---|---|
| Countries | e | Countries | E | Countries | e | Countries | e |
| Phili | -3.268 | United | -1.6861 | Australia | -2.33114 | Austral | -1.68212 |
| Norwa | -2.97391 | Mexico | -1.5443 | Switzerlan | -1.44051 | Singapore | -1.64665 |
| New Z | -2.43919 | Portuga | -1.34222 | Hong Kong | -1.34393 | Mexico | -1.59876 |
| Qatar | -1.80498 | Singapo | -1.3258 | Israel | -1.17331 | Hong Ko | -1.44803 |
| Czech | -1.4923 | Ireland | -1.14011 | Austria | -1.04321 | United | -1.20369 |
| Turke | -1.48844 | Hungary | -1.01339 | Spain | -0.85176 | Japan | -1.12128 |
| Portu | -1.43307 | South A | -0.8951 | Singapore | -0.75524 | Israel | -1.09102 |
| PA.NE | -1.34109 | Austria | -0.87135 | Oman | -0.73787 | Finland | -0.9651 |
| Israe | -1.27082 | Czechia | -0.83931 | Indonesia | -0.71933 | Lithuan | -0.96465 |
| Russi | -1.23846 | Switzer | -0.70693 | Russia | -0.68336 | India | -0.87386 |
| Pakis | -1.09936 | Canada | -0.51779 | Sweden | -0.5333 | Greece | -0.71093 |
| Italy | -1.08221 | Lithuan | -0.49934 | Lithuania | -0.49991 | South K | -0.66404 |
| Baham | -0.98687 | Estonia | -0.42158 | Czechia | -0.49577 | Vietnam | -0.63517 |
| Canad | -0.8888 | Japan | -0.40297 | India | -0.46963 | Spain | -0.61661 |
| Spain | -0.79785 | South K | -0.26633 | U.A.E | -0.42583 | Egypt | -0.57935 |
| Cambo | -0.60346 | Egypt | -0.12208 | Japan | -0.29254 | Portuga | -0.57699 |
| Malta | -0.56551 | India | -0.11867 | Malaysia | -0.24818 | Norway | -0.42112 |
| Burma | -0.48447 | Turkey | -0.03885 | Thailand | -0.21075 | Sloveni | -0.40767 |
| Brazi | -0.33941 | Spain | 0.07665 | Italy | -0.14619 | South A | -0.3834 |
| Mexic | -0.27912 | Brazil | 0.13338 | Turkey | -0.14124 | Ireland | -0.37151 |
| Bangl | -0.23606 | Austral | 0.3059 | Ireland | -0.04722 | Denmark | -0.2009 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| New Z | -0.23126 | Saudi A | 0.32505 | Finland | -0.04533 | Bulgari | -0.15941 |
| Sri L | 0.06425 | Italy | 0.32636 | Egypt | -0.00885 | Saudi A | -0.12092 |
| Switz | 0.13321 | Belgium | 0.48251 | Ukraine | 0.04216 | Canada | -0.11655 |
| U.A.E | 0.32082 | Poland | 0.67208 | Estonia | 0.0864 | Romania | -0.07174 |
| Liber | 0.34625 | France | 0.74232 | S.Koria | 0.167 | Check R | 0.01212 |
| U.K | 0.40365 | Rusia | 0.77059 | Nigeria | 0.17373 | Swedin | 0.19632 |
| Franc | 0.5979 | Netherl | 0.90216 | Vietnam | 0.27979 | Chaina | 0.2246 |
| Filip | 0.60834 | UK | 0.92229 | Brazil | 0.3191 | Hungary | 0.24032 |
| Belgi | 0.87781 | Finland | 1.06025 | Iceland | 0.38885 | Brazil | 0.25358 |
| Germa | 1.0716 | China | 1.20315 | China | 0.4154 | US | 0.43606 |
| Tilan | 1.08785 | Denmark | 1.21436 | Portugal | 0.74688 | Algeria | 0.4541 |
| Vetna | 1.09826 | US | 1.29766 | Denmark | 0.86606 | Austria | 0.52174 |
| Panam | 1.2059 | Norway | 1.89478 | Poland | 0.9951 | UK | 0.70427 |
| India | 1.26556 | | | US | 1.01284 | Swithze | 0.7641 |
| Nethe | 1.32841 | | | Belgiem | 1.0686 | Russia | 1.06802 |
| Austr | 1.34572 | | | France | 1.09741 | Italy | 1.12224 |
| Malay | 1.41517 | | | Angola | 1.13276 | Poland | 1.13107 |
| Indon | 1.52378 | | | Netherland | 1.4526 | Turkey | 1.14622 |
| S.Kor | 1.73644 | | | Germeny | 2.19408 | Netherl | 1.49888 |
| Japan | 1.81148 | | | UK | 2.20564 | Slovaki | 1.74154 |
| Hong | 2.48782 | | | | | Belgiem | 2.14837 |
| US | 2.72524 | | | | | France | 2.36591 |
| China | 2.88918 | | | | | Germeny | 2.602 |

| US | | Japan | |
|---|---|---|---|
| Contries | e | Contries | E |
| Sweden | -1.44829 | Sweden | -1.92206 |
| Russia | -1.36451 | Bangladesh | -1.58605 |
| Indone | -1.14945 | Czechia | -1.24922 |
| Qatar | -1.0637 | Pakistan | -1.08915 |
| Egypt | -1.06314 | Saudi Arab | -1.06391 |
| Norway | -0.95126 | Hungary | -1.03836 |
| South | -0.95073 | South Afri | -1.03007 |
| New Ze | -0.88316 | New Zealan | -0.99604 |
| Spain | -0.85828 | Kuwait | -0.98813 |
| Turkey | -0.62067 | Israel | -0.82713 |
| Italy | -0.54387 | Poland | -0.76648 |
| Kuwait | -0.42732 | Oman | -0.69684 |
| Argent | -0.4252 | France | -0.59624 |
| Philip | -0.36359 | Spain | -0.5766 |
| India | -0.34261 | Switzerlan | -0.28052 |
| Thaila | -0.30426 | S.Koria | -0.21176 |
| Vietna | -0.19701 | Italy | -0.18391 |
| Irelan | -0.13026 | UAE | -0.14181 |
| Peru | -0.1041 | Belgium | -0.13284 |

| | | | |
|---|---|---|---|
| France | -0.07575 | Philippine | -0.12292 |
| Austra | -0.05897 | Chile | -0.08892 |
| Israel | 0.00258 | Turkey | 0.27795 |
| Saudi | 0.04013 | Honkgong | 0.28554 |
| Malays | 0.04038 | Vetnam | 0.42519 |
| Chile | 0.1651 | Netherland | 0.4486 |
| Germen | 0.18043 | Singapor | 0.49267 |
| Switze | 0.18178 | India | 0.52303 |
| Brazil | 0.20683 | Malesia | 0.57567 |
| Panama | 0.21788 | Mexico | 0.57821 |
| Japan | 0.29462 | Canada | 0.61047 |
| U.A.E | 0.3604 | Panama | 0.62241 |
| U,K | 0.41849 | UK | 0.6936 |
| China | 0.43904 | Germeny | 0.72513 |
| S. Kor | 0.54225 | Russia | 0.81565 |
| Belgiu | 0.65059 | Brazil | 0.85318 |
| Nether | 0.702 | Indonesia | 0.93538 |
| Guatem | 0.79894 | Australia | 0.97206 |
| Singap | 0.87276 | Thiland | 1.25146 |
| Honk K | 1.14589 | Chaina | 1.38248 |
| Colomb | 1.45634 | US | 3.12029 |
| Canada | 2.28303 | | |
| Mexico | 2.32668 | | |

Appendix 2 top-10- Lower performing countries competitive data

| Fuji | | Bolivia | | Madagascar | | Sierra Leone | |
|---|---|---|---|---|---|---|---|
| Countries | e | Countries | e | Countries | e | Countries | E |
| Iceland | -7.76793 | Australi | -6.81703 | Cote d'I | -7.44932 | Russia | -8.90725 |
| Bulgaria | -5.98082 | Bahrain | -5.12532 | Japan | -6.7278 | Republic | -5.8236 |
| Ireland | -4.45795 | U.A.E | -4.93212 | Greeck | -4.63721 | Hong Kon | -5.06223 |
| Greece | -4.26934 | Indonesi | -3.70037 | Czech Re | -1.68951 | Mozambiq | -4.76833 |
| Egypt, A | -3.8308 | Georgia | -3.66263 | Denmark | -1.32364 | Mali | -3.97837 |
| Italy | -3.77728 | Czech Re | -3.44473 | Australi | -1.23286 | Croatia | -3.92269 |
| Iran, Is | -3.73759 | Jordan | -2.36996 | Argentin | -1.0297 | Ireland | -3.8287 |
| Denmark | -2.33455 | Iraq | -1.19557 | Brazil | -0.95651 | Hungary | -3.35615 |
| Switzerl | -2.29561 | Spain | -1.1636 | Finland | -0.42013 | Denmark | -3.24647 |
| Austria | -2.28276 | India | -1.08245 | Bahrain | -0.40573 | Ireland | -3.12072 |
| Israel | -1.87331 | Liberia | -0.68604 | Cameroon | -0.14584 | France | -2.9935 |
| Czech Re | -1.81745 | Israel | -0.16822 | Congo, R | -0.10374 | Italy | -2.82653 |
| Belgium | -1.44725 | Argentin | -0.05151 | Switzerl | 0 | Australi | -2.30349 |
| Argentin | -1.43373 | Chile | 0.10314 | Hong Kon | 0.04099 | Angola | -2.11805 |
| Chile | -0.9385 | Greece | 0.50918 | Banglade | 0.433 | Germany | -1.25175 |
| Iraq | -0.83624 | France | 0.57967 | Egypt, | 0.73656 | Seychell | -1.10274 |
| Germany | -0.77176 | China | 0.61875 | Eritrea | 0.78128 | Turkey | -0.84281 |
| France | 0.95069 | Ireland | 0.66075 | Burkina | 0.89442 | Kenya | -0.49737 |
| Canada | 1.43649 | Italy | 0.73672 | Chil | 1.32082 | Indonesi | -0.29899 |
| Dominica | 1.51323 | Austria | 1.33932 | United K | 1.64701 | Morocco | -0.01281 |
| China | 1.59389 | Cyprus | 1.5484 | Benin | 1.65097 | United A | 0.23135 |
| India | 1.64044 | Switzerl | 1.88532 | Germany | 2.06569 | Portugal | 0.29417 |
| Dominica | 1.68434 | Dominica | 2.03094 | Afghanis | 2.10804 | Vietnam | 0.40926 |
| Indonesi | 2.31279 | Korea, R | 2.08574 | Spain | 2.14011 | Banglade | 0.42639 |
| Hong K, | 2.80213 | Banglade | 2.43295 | China | 2.31809 | Spain | 0.76719 |
| U.A.E | 2.87675 | Canada | 2.44548 | U.A. E. | 2.85101 | The Gamb | 1.40232 |
| United K | 2.87787 | United K | 2.6327 | Canada | 3.01538 | South Af | 1.56027 |
| Spain | 3.05982 | Cuba | 2.81031 | France | 4.11863 | US | 1.71996 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Banglade | 3.80108 | Japan | 2.922 | | | India | 1.74244 |
| U.S | 3.98878 | Brazil | 3.69716 | | | Senegal | 1.8122 |
| singapor | 4.08769 | Jamaica | 5.36101 | | | S. Korya | 1.82931 |
| Australi | 4.45928 | | | | | Guinea | 1.88239 |
| luxembou | 4.80388 | | | | | Egypt | 1.8877 |
| Burkina | 5.96374 | | | | | Belgium | 1.90577 |
| | | | | | | Liberia | 2.34405 |
| | | | | | | Nigeria | 2.62264 |
| | | | | | | Cameroon | 2.65457 |
| | | | | | | Switzerl | 2.67654 |
| | | | | | | China | 2.72949 |
| | | | | | | UK | 2.89772 |
| | | | | | | Eswatini | 3.0158 |
| | | | | | | Ghana | 3.70785 |
| | | | | | | Benin | 4.44063 |
| | | | | | | Lebanon | 4.79063 |
| | | | | | | Netherla | 4.96883 |
| | | | | | | Cote d'I | 5.54308 |