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**WORLD MARITIME UNIVERSITY**

Malmö, Sweden

**IMPACT OF MARITIME TRADE ON THE  
SIERRA LEONEAN ECONOMY**

By

**RAJU GIDWANI**  
**Sierra Leone**

A dissertation submitted to the World Maritime University in partial  
fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE**  
**in**  
**MARITIME AFFAIRS**

**(SHIPPING MANAGEMENT AND LOGISTICS)**

2022

## Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature):

.....

(Date):

.....

Supervised by: **Prof. Pierre Cariou**

.....

Supervisor's affiliation **SML**

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## Abstract

Title of Dissertation: **Impact of Maritime Trade on the Sierra Leonean Economy.**

Degree: **Master of Science**

The current study looked at how Maritime Trade affected the Sierra Leonean economy from 1991 to 2020. The dependent variable for all two hypotheses was maritime trade in millions of dollars, whereas the independent variables for hypotheses one and two were the gross domestic product and foreign reserves of Sierra Leone.

Due to globalization and the growth of international trade, it is essential to analyse maritime trade and its effect on the economy of a country. Maritime trade influences national and regional economies. The knowledge and understanding of economic impacts and how they help in guiding policy-makers in taking and making useful decisions which can foster the well-being of a nation is vital in this research.

To that end, this research evaluates the role of maritime trade, its positive and negative effects/impact on the Sierra Leonean economy. The findings demonstrated that the GDP and the economy of Sierra Leone have significantly benefited from Maritime Trade. Additionally, it demonstrates the close relationship between Maritime Trade and Sierra Leone's level of foreign reserves.

**KEYWORDS:** Maritime Trade, Sierra Leone, Trade Theories, Gross Domestic Product, Foreign Reserves.

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## List of Abbreviations

<b>ADB</b>	African Development Bank
<b>AEIB</b>	African Export and Import Bank
<b>AU</b>	African Union
<b>ECF</b>	Extended Credit Facilities
<b>ECOWAS</b>	Economic Committee of West African States
<b>EPIA</b>	Export and Promotion Investment Agency
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organisation
<b>GATS</b>	General Agreement on Trade in Services
<b>GDP</b>	Gross Domestic Product
<b>ILO</b>	International Labour Organisation
<b>IMF</b>	International Monetary Fund
<b>IMO</b>	International Maritime Organisation
<b>MLC</b>	Maritime Labour Convention
<b>MOTA</b>	Ministry of Transport and Aviation
<b>MRU</b>	Mano River Union
<b>NEPAD</b>	New Partnership for Africa's Development
<b>NRA</b>	National Revenue Authority
<b>PTA</b>	Preferential Trade Agreement
<b>RMU</b>	Regional Maritime University
<b>SLMA</b>	Sierra Leone Maritime Administration
<b>SLNSC</b>	Sierra Leone National Shipping Agency
<b>SLPA</b>	Sierra Leone Ports Authority
<b>STCW</b>	Standard of Training Certification and Watch Keeping
<b>UK</b>	United Kingdom
<b>UN</b>	United Nations
<b>UNCTAD</b>	United Nations Conference on Trade and Development

<b>WHO</b>	World Health Organisation
<b>WITS</b>	World Integrated Trade Solution
<b>WTO</b>	World Trade Organisation

# Chapter 1 Introduction

## 1.1 Background

Due to globalization and the growth of international trade, it is essential to analyse maritime trade and its effect on the economy of a country. International transportation is currently in high demand and is essential to every nation, especially those pursuing growth. It is crucial to identify them since the volume of carried commodities and services varies annually depending on the country in question. The majority of the demand for sea transportation is created by the global economy, either via the trade in manufactured goods or the import of raw materials for the manufacturing sector. Since it is one of the least expensive means of transportation and uses natural communication channels like seas and oceans, maritime transport is the most effective for facilitating international trade. Transports, which are important to the world economy, vary between river, air, train, road, and pipeline transportation (Antonellini, 2021).

Sierra Leone a small developing country in West Africa understands the significant role maritime trade and shipping can play in the sustainability of its economy. In definition, Maritime trade can be defined as a trade in which goods and services are exchanged amongst two or more countries using sea transportation. It can be either international or national business trade transactions. Nations which are considered developed in the world significantly rely on the contribution of both national and international maritime trade for the growth of their economy. The sustainability of Sierra Leone's economy largely depends on maritime trade because majority of its trade transactions are through the use of sea transportation. The country is largely known internationally for its produce of ores and metals, agricultural raw materials, fishing products, manufactured goods and other food items (UNCTAD Stat, 2020). Most of these goods are not produced for and cannot be beneficial for domestic markets. Hence, the use of maritime trade by Sierra Leone and her regional trade collaboration are significant for the exporting of these goods which can positively contribute to the economy.

From the map shown below, it is clear that Sierra Leone is not a land locked country. It is situated in the Gulf of Guinea in West Africa, boarded by Guinea and Liberia along the Atlantic Ocean. This shows that it has an explicit advantage to sea transportation and the nation's resources are plentiful and its topography is favourable. The nation also has abundant fisheries, forests, and other forms of land that are renewable natural resources. The country's entire land area (71,740 km<sup>2</sup>) is around 75% arable.

It has one of the largest and deepest natural Harbour in the world and consists of ports like, Freetown ports, Nitty 1 and Nitty 2 ports and Kissy Oil Jetty terminals which are indispensable for exports and imports of goods and services. A very important and significant factor in Sierra Leone's benefit in maritime local and international trade is its strategic location which gives it easy access to the world. According to UNCTAD Statistics, (2020) Sierra Leone made an estimate of merchandise export of 368 million UD\$ worth of goods globally. With a population of 7.977 million people and GDP of about 4 Billion US\$, it is evident that maritime trade plays an important role in Sierra Leone's economic growth.

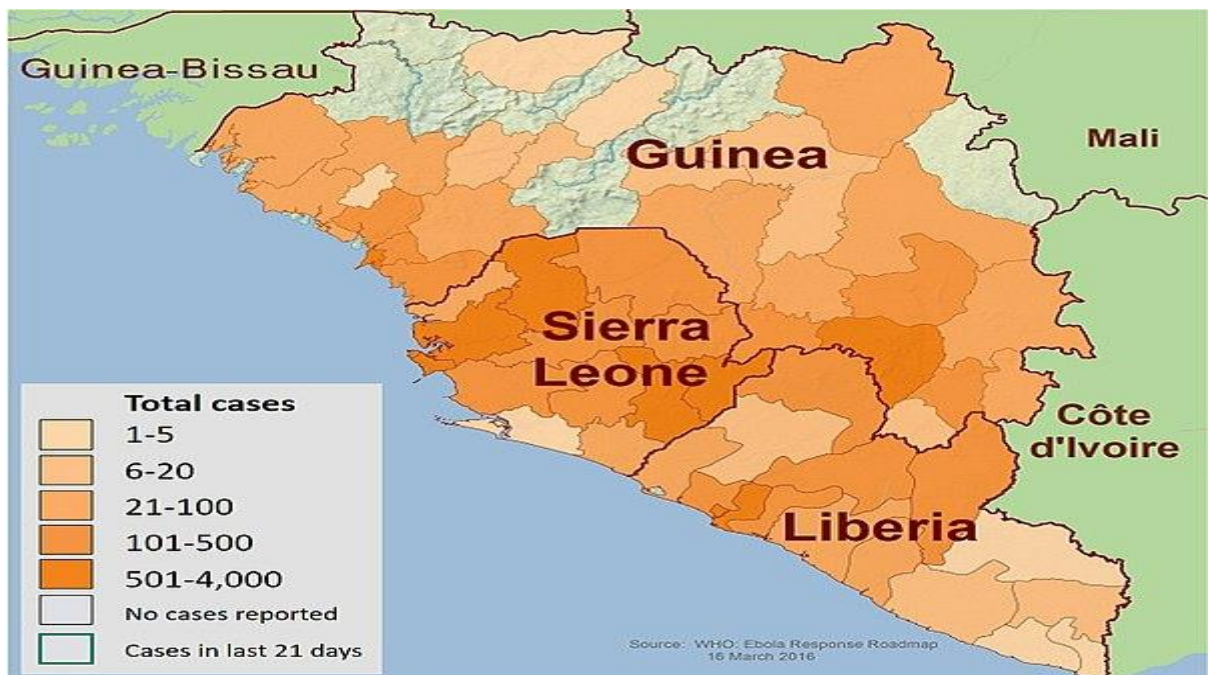


Fig 1. 1 WHO: Ebola Response Roadmap (WHO, 2016)

Globally, the maritime industry has and continues to be a significant factor in business sectors for importing and exporting products and industrial merchandise, with seaports serving as a gateway to countries worldwide. The faster the global trade progresses than global yield, the advancement of local economies will be greatly impacted significantly by maritime trade. Maritime trade continues to stand at an exceptional position in the economy of countries all over the world. This trade may include all business concerned with the blue economy which takes place in a country's maritime space (Elem, 2008).

In the dry bulk maritime trade, Sierra Leone exports ores, timbers, cocoa beans and many more which requires shipment through dry bulk carriers. Also Sierra Leone has a high demand for containers, which mostly carries raw materials and manufactured goods. Additionally, due to the strategic position of the country's national airport, passenger and water taxi services is highly utilized. In land waterways trade and adaptability of residents in the West African sub-area is growing swiftly and is predicted to be maximized when some provincial and sub local monetary inclusion is fully implemented.

Concerning flag state responsibility, Sierra Leone has over 400 international vessels registered to its flag and is at the moment emerging within Sierra Leonean economic sphere, which brings in development as expected in the economy of the state. Also in Port advancement, the deregulation and liberalization of port operations to include private participants is the most major shift happening in Sierra Leone's shipping sectors. These factors have led to the nation's major ports being given to private operators as they are being constructed. Despite all, the country needs modern, high-productivity managed ports to meet the growing need for efficient port administrations. Currently, Sierra Leone has a set number of port concessions, and the moderate to long-term economic growth anticipated should force the port infrastructure to accommodate the size of vessels and the volume of traffic.

Also as stated above, the country is blessed with natural resources such as fish. Aquaculture, artisanal, industrial, and inland fisheries make up the nation's fishing sector. For the majority of Sierra Leoneans, the sector is a substantial source of

employment, revenue, and the country's main protein supply. Through maritime trade and also registrations of fishing vessels, the fishing industry contributed around 7% of the nation's GDP in 2010 (FAO, 2010).

The enhancement and coordination of maritime trade, which is crucial to the growth of worldwide export and import operations with other nations, should reflect the financial growth of more emerging economies in Africa, including Sierra Leone. This is due to the fact that maritime operations effectively serve as every growing nation's enabling and advancing force. Therefore, the design of management approaches and frameworks that disturb the comprehensive and broad management of this fundamental sub-financial framework will have an impact on the effectiveness and prosperity of the developed world as a whole and its people. Even while maritime trade significantly boosts the economy in terms of GDP, foreign reserves, and debt repayment, it is good to note that more may be achieved with the support of capable and reliable frameworks. According to international standards, a nation's economy must adopt certain distinctive and flexible state-of-the-art methods (Valentine et al, 2013). By attempting to find solutions to problems, this research will evaluate the impact of the maritime trade on the economy of Sierra Leone.

## 1.2 Problem Statement

Sierra Leone is considered and has been rated amongst the poorest countries in the world. Although, this West African country has significant natural resources such as mineral resources, fish, forest, ocean and marine resources which can help the growth of the economy through international maritime trade. However, she is yet to be exceedingly productive, effective and remarkable in the function of maritime trade and global shipping.

It is clearly seen and a fact that approximately ninety percent (90%) of goods (cargo) coming in and going out of Sierra Leone is via the ports of Freetown and Nitty ports. According to the United Nations conference on trade and development (UNCTAD) statistics, 291 ships were noted in the seaports of Sierra Leone in the year 2020 (unctadstat.unctad.org, 2020).

While the government's priority is in agriculture and mining sector which will gear towards reviving the economy to sustainable heights, the maritime industry plays a significant role in fulfilling government's agenda through transportation of dividend from agriculture and the mining sector globally.

Regardless of the enormous positive effects generated by maritime trade, negative and unfavourable effects have also engulfed the industry such as lack of maritime legal framework in Sierra Leone, inadequate infrastructure, financial and environmental issues which are causing significant setback globally and affecting the economy of countries (F.E Ogunleye, 2020).

This research will evaluate the role of maritime trade, its positive and negative effects/impact on the Sierra Leonean economy.

### 1.2.1 Research Question

Sierra Leone is one of the major maritime trading nations on the African continent.

Therefor this research seeks to answer the following questions;

- How positively does maritime trade affect the economic growth (GDP) of Sierra Leone?
- What effect does Sierra Leone's maritime trade have on the country's foreign reserves as benchmarks?

### 1.3 Aims and Objectives

In this research, the aim and objective will be to understand and evaluate the impact and the viable utilization of maritime trade to help the economy of Sierra Leone. It will look at different stakeholder's involvement in maritime trade and its implications on the country's economy.

The study will also aim at understanding the importance as well as the challenges associated with maritime trade with regards to its contribution to the economic growth of Sierra Leone.



## 1.4 Research Scope and Purpose

Often, the economic strength of countries is assessed using GDP, which is defined as the estimation of goods and services supplied over a certain year, which includes maritime trade (Antonellini, 2021). Over the period of 1970–2012, Valentine et al. (2013) found a strong correlation between the global gross domestic product (GDP), global goods trade, and seaborne shipments. These indices grew simultaneously but at different rates. The globalization of industrial processes, increasing commerce in intermediate products and components, and the extension and deepening of global supply chains are only a few factors that contributed to the economic growth. The maritime industry is closely linked to economic growth. Since 85% of all items that are carried will at some point be sent by vessels, shipping plays a significant part in the global economy (Michail et al, 2021).

The maritime sector, if utilized effectively, should have a staggeringly positive impact on Sierra Leone's GDP and influence the growth and improvement of the economy through market expansion, opening doors for global trade, competition, and revenue, as well as providing crucial regional interest (UNCTAD, 2018).

It is currently essential to do a research on sensitive topics such as the relationship between financial development, foreign reserves, loan repayment, and maritime trade in Sierra Leone. Thus, a decision must be made on the necessity to provide a long-term solution to the problems of economic stagnation, extreme poverty, and the management of the country's abundant natural resources.

This study focuses on a broad element of maritime trade and how it relates to Sierra Leone's economic development, with particular attention paid to GDP and foreign reserves. The research also spans a 30-year period from 1991 - 2020. Lack of or insufficient access to reliable data and information might make the study difficult.

## 1.5 Disposition of Dissertation

This study will be divided into six chapters. In chapter one, it will look at the background of study, gives the problem statement and research questions, purpose and structure of the study. In chapter two, it will examine the results of other research theory and conceptual framework in the field of study. Chapter three will give an

insight about maritime trade in Sierra Leone. It will also discuss the challenges and economic impact of maritime trade in Sierra Leone. Chapter four will discuss the methodology used in this research. The data source, data design and data analysis will be provided. Chapter five will provide the empirical analysis of the dependent and independent variables values from 1991 - 2020, and finally Chapter six will provide conclusion and recommendations.

*Figure 1.2 Illustrates the structure of the dissertation*



## Chapter 2 Literature Review

### 2.1 Introduction

In the previous section, a brief background in to the study, objectives of the research, problem statement were discussed. This section focuses on assessing largely maritime trade, taking in to consideration some theories that support this research. To do so, we first present the contribution of maritime trade to economic development, then we present different theories/methods such as product life cycle, PESTEL, neo mercantilism and other theoretical frameworks that can be used to analyse this contribution.

### 2.2 Maritime Trade Contribution to Economic Development

Maritime trade influences national and regional economies. The knowledge and understanding of economic impacts and how they help in guiding policy-makers in taking and making useful decisions which can foster the well-being of a nation and by intensifying or facilitating the transportation of goods and services through a trade corridor (Boske and Cuttino, 2003). There are various literatures on how maritime trade has been developed across the world differently. The welfare of people and economies of nations would not be the same if the activities done at sea were in nonexistence. Hence, the blue economy plays a vital role in a country's economic growth, helps in providing food and several other resources for people, aid in improving tourism and facilitate maritime transportation. Sea transportation is of high significance to the world's economy, it records and constitute 80% of global trade which highly influences the development of the economy (Fratila et al, 2021).

According to Lane and Pretes, (2020) maritime trade and access to sea transportation plays a significant role when determining a nation's economic growth. It is evident that maritime trade is very important when it comes to the global economy and has become a backbone in the existence of the economic system.

The United Nations Conference on Trade and Development (UNCTAD), 2019, reported that maritime is the cornerstone of world trade and contributes immensely to

manufacturing supply chain. UNCTAD (2019) further reported that it is estimated that one-fourth of the volume of global trade is done by sea transportation. Further stating that 80% of world trade volume is carried out by sea transportation and also accounts for 70% of its value. Maritime trade includes and can be related to all maritime activities which can occur in a country's maritime space such as, fishing, salvage, underwater resources, towage, ferry services as well as port activities, shipping (Maritime transport), ship construction and dry docking activities which plays a very important role and has a strategic position in the global economy (Ekpo, 2012).

The shipping industry is seen to be one of the largest, most well-established, and well-defined sectors of global trade. Because "he who controls the sea, governs the globe," a truth that the Egyptian, Roman, Turkish, Spanish, and British domains assign great weight and value to, it includes a vast array of political forces and has a regional influence (Mukherjee, 2010). In order for a nation to thrive economically, shipping is essential, particularly in freight logistics, which is the shipping of products by sea and is a component of the supply chain. Ships are utilized as logistical equipment to convey these goods and services. (Fremont, 2009).

Since the second world war, the maritime industry is and continues to be a global commerce which includes creativity, specialized skills, huge benefits and great economic influence to a nation (Ma, 2011). Due to demands created by the global market, freight transportation underwent a significant transformation a few decades ago. The whole maritime sector needs to reconfigure itself in order to keep up with the surge in demand as a result of the expansion of global trade. It plays a very important and significant role in the supply chain. Within the global supply chain, this new trend in the sector has contributed to an expansion in value-added logistics services. (Song and Panayides, 2015). Now, shipping is a global community pattern using performance fleet and advanced technology to communicate which signifies one of the basics of free trade. From the beginning to the present day, maritime trade has not only been commensurate with the world economy but also has contributed immensely to development (George, 2014). A very renowned economist and philosopher Adam

Smith, interprets the shipping industry as a major source of monetary advancements. He expressed how division of work and labour of an industrialist society can lead to a huge strength of power of an economy and when this is realized, it will in great extent influence a huge sense in the share of industry and supply chain. As an economist, he revealed that the shipping industry through ship operations to be easiest source that can create more specialized industries and the cheapest source of transportation that can carry a huge volume of cargo thereby improving international trade (Mshela, 2002).

According to Kenneth (2019), maritime trade does not only bring huge benefits to the economy of a nation but brings in huge development for a region. He mentioned in his book how maritime trade leads to the development of systems of socioeconomic integration in the mainland civilizations of Angkor and Chapa in Asia. He further explained how Funan's success as a maritime depot and the introduction of statecraft models to serve in the maritime trade to facilitate transportation within the region. Further to the development of a nation, Dwarakish and Salim (2015) revealed that maritime transportation is considered a huge factor in the regional balanced development and economic strength of a nation leading to integration in the world economic market. Development of ports in a nation creates an important economic venture in coastal areas. These port's development increases the economic gain and facilitates maritime trade.

The Greek shipping industry can be seen as a source of development and a role model in global maritime transports. The industry is responsible and serves as the highest contributor to the Greek economy and accounts for the most important export sector. Because it is properly utilized and efficiently managed, the shipping fleet assets contributes immensely to the Greek economy. The maritime industry also provides huge number of employments for the citizens of Greece (Pradeka and Zarkos, 2014). As stated in the problem statement, regardless of the significant impact of maritime trade to the economy, negative impacts also exist in the shipping industry. Trade flows are complex networks because they are created by global supply chain. Such structure does not only affect the development of a nation but also impacts their ecosystem. The

maritime industry through ship operations are considered a source of Co2 emissions and immensely affects climate change. Following the announcement of Arctic shipping expansion, the need to study the effectiveness of the maritime trade network and forecast future trade flows has never been more essential (Kosowska-Stamirowska, 2020).

### 2.3 Product Life Cycle Theory

As developed by Raymond Venon as Venon trade theory and as cited by Audretsch et al, (2017). Trade is greatly associated to the wealth of nations, it contributes to competitiveness in global market which is an important factor for national growth. As a product moves through its life cycle, an industry will start by exporting its goods and then welcome foreign direct investment. This may be due to the fact that as commodities develop, both ideal production and sales sites change and have a tendency to affect the flow and direction of import and export. It is understood that this theory explains that when the demand for domestic market decreases, the industry can then expand internationally to tap in to new markets.

### 2.4 PESTEL Concept to Trade

According to Francis Aguilar as cited by Medoza (2019), PESTEL indicates that Political, Economic, Social, Technological, Environmental and Legal are external factors which can probably affect Maritime trade in different ways and can hinder the economic growth of a nation. When a country is blessed with a stable Political, Economic, Social, Technological, environmental and Legal factors, it will boost and keep the maritime industry and trade strong, safe and this in turn will significantly impact the growth of the country's economy. The P.E.S.T.E.L theory gives a strategic approach to be able to examine the external factors of any business or industry and also to pinpoint key elements that can impact the growth of the business. It also guarantees that some essential features in making strategic decisions are not disregarded. The P.E.S.T.E.L framework is an easy technique to encourage the growth of strategic and external thinking. It may, however, oversimplify the facts for strategic

decision-making and neglect to look at internal issues. P.E.S.T.E.L requires ongoing work since the microenvironment is always changing.

## 2.5 Neo Mercantilism Theory

According to Ally (2015), this theory is used to describe a policy mechanism to boost exports and prevent imports of a nation in international trade. It gives special importance on a nation being self-sufficient through a beneficial balance of trade. In the actual world of today, all governments have a tendency to urge its business people to grow exports rather than imports in order to boost the national economy and amass foreign cash. Due to its strategic location and access to natural resources like minerals and agricultural products like cocoa and coffee, Sierra Leone has a distinct advantage when it comes to increasing exports. The fact that the nation has been significantly opened to the world market should be a bonus for maximizing the benefits of this idea. This idea can be used to determine if the government of Sierra Leone has effectively used subsidies and levies to promote exporters over imports.

## 2.6 Other Theoretical Framework

As suggested by Bagwell and Staiger (2011), governments involve in trade agreements to find a way out of a prisoner's dilemma motivated by terms of exchange. On the basis of pre-negotiation data, such as tariffs, import quantities and prices, and trade elasticities, they create a relationship using the terms-of-trade theory that forecasts negotiated tariff levels. They continue that the practical and effective use of tariffs to examine the terms of trade impact could suggest clarification on many of the basic qualities of the present multilateral trading framework. Even though multilateral agreements are sometimes viewed as difficult agreements because they need a lot of time to discuss and come to an agreement, it is crucial to remember that 90% of trade throughout the world is carried out by sea. Government promises on maritime services are not formalized under the General Agreement on Trade in Services (GATS), making maritime services more susceptible to restrictions. As a result, the multilateral trading system needs to be changed with relation to maritime shipping transport. Countries must therefore develop internal policies to reduce or do away with any restrictions that

might be creating a barrier. Countries must develop domestic policies that lessen or eliminate any marine trade restrictions that may be working against them and harming their nation's economy by lowering their restrictive measures to minimal levels.

There has long been the idea that a country may benefit from protectionism. There are two main reasons why countries feel like their terms of trade have improved as a result of tariffs. Firstly, there are a number of possible prices at which countries would be persuaded to trade and secondly, if international suppliers decrease their prices it will lead to more profits which will sustain market access (Buhari, 2013).

Edgeworth's approach went a step further and suggested an expression that equals the welfare-maximizing trade-off and the inverse of the export supply elasticity. Furthermore, a more general application of the fundamental notion that a nation's optimal tariff increases its market power. To maximize wellbeing, there is no need for government.

Finally, the link between the ideas of "balance of trade" and "term of trade" has been the subject of investigation in the analysis of trade theories. The connection between a country's overall amount of exports and imports during a certain period of time is known as its trade balance. Exports are advantageous when they increase the trade balance; otherwise, they result in a loss (Branch, 2000).

$$\text{Balance of trade} = \text{Total Export} - \text{Total Import}$$

$$\text{Term of trade} = \frac{(\text{Index of export trade})}{(\text{Index of import trade})} \times 100\%$$

From the above equation, the relationship between terms of trade and balance of trade shows that, if there is an enhancement in terms of trade, it will yield profitable outcome of balance of trade, depending that there is an inclusive import and export. The benefits of the balance in trade will be diminished if the demand is elastic. A mechanism in the context of commerce does not indicate a loss-making in balance of trade. A change in



the terms of trade will increase demand if the need for greater import and export is relatively elastic (Branch, 2000).

## CHAPTER 3 Maritime Trade in Sierra Leone

### 3.1 Introduction

This chapter presents Sierra Leone's current pattern of trade, the importance of Sierra Leone's international and national trade positioning, taking in to consideration her agricultural and mining sectors' connection with maritime trade. It also reviews the difficulties that the Sierra Leonean economy and maritime trade face in the context of international trade.

### 3.2 Sierra Leone Experience in Maritime Development

History of sea trade in Sierra Leone is dated as far back as in the early 1800s. The slave trade in the New World began with the Portuguese, and other nations quickly followed. The ship owners viewed slaves as cargo to be transported as quickly and inexpensively as possible to the Americas, where they would be sold to work on coffee, tobacco, cocoa, cotton, and sugar plantations, in gold and silver mines, in rice fields, in the construction industry, cutting wood for ships, and as domestic servants. In order to monitor for illicit slave ships, the British created a naval base in Freetown and imposed a 100-pound fee for each slave discovered aboard a British ship (Bonne, 2017).

Bonne (2017) further stated that Britain's primary concern at the start of the 19th century was commerce with India, which it had already come to dominate by the end of the 18th century. Due to the fact that ships traveling to and from India had to sail along the African coast, where they could buy supplies and occasionally get shipwrecked, the British got interested in Africa incidentally. In the end, the British only controlled the Gambia, Sierra Leone, the Gold Coast, and Nigeria because only a small number of locations in West Africa, such as the Gold Coast and the Slave Coast (modern Nigeria), produced sufficient profit to make them desirable in their own right.

After the era of the slave trade, port advancement in Sierra Leone rose in Freetown as the main port and Nitty 1 and Nitty 2 following broad and costly harbour works. In 1964, the Quay's management was turned up to the government of Sierra Leone. In

2007, it made the decision to privatize the land, changing the port from a "service" port to a "land lord" port.

The modern city port hierarchy of tropical Africa is made up of a small number of significant international multipurpose centers and a greater number of port towns that operate within the state's regional economic structures (Sadiq et al, 2021). At this point port advancement strategy became a process of distributing port infrastructure within most coastal areas of Sierra Leone. It was seen as a way of development by creating a couple of ports and building up a variety of seaports outlets. Following independence, many became their nation's principal port as well as its capital, key industrial and economic hub, the main market for locally produced products and services as well as their imported equivalents, the location of the new elite's highest concentration, and its cultural hub.

Such port development and additions reflected the dominating regional and local financial conditions that influenced interest in maritime and port infrastructure. As a result, during the 1930s Great Depression, large open works were discontinued or given up, especially because there was less maritime trade and shipping activities. However, the design and implementation of port development endeavours were motivated by the hopeful outlook induced by a trade reverberation following the end of the two renowned world wars 1 and 2, or by the desire for one (Ndikom, 2015).

Looking at the experience in organization of ports in Sierra Leone, the framework of Sommer's (1976) model assumes structural change as cities transition from the traditional to the colonial to the post-colonial eras. It idealizes African port-city structure and is dynamic. It emphasizes links and how they have evolved through time rather than positing a zonal structure overlaid by sectors. The substantially greater importance of port activities during the colonial and post-colonial periods is significant here (Gleave, 1997). Regarding port locations, the development of the space economy, and the rise of Freetown Port as the leading port on Sierra Leone's coast, all of which had an impact on the expansion of the port and the city, the experience described in Vance's (1970) model of the Development of Central Place Systems in a Colony and

its "Motherland" may be particularly helpful in explaining not only the concentration of the majority of Sierra Leone's modern sector industrial, commercial, and service activity in Freetown but also their location within the urban area. Similarly, the linkages between ports and hinterlands in a competitive environment for both commerce and limited investment in port facilities are important to consider in order to partially explain the evolution of Freetown as a port. As a result of the mechanisms outlined in Rimmer's (1967) model, the coast of what is now Sierra Leone appears to have advanced in its evolution through some of the stages indicated in them.

Again in the development of control and assortment of sovereignty, in the ports, especially the important ones like the ports of Freetown and Rutile, there were a variety of specialists and controls. These includes Port authority, Maritime Administration, Navy, Customs and private port operators each responsible for specific port activities such as levy gatherings, ferry services, tug services, pilotage and harbour activities. As stated by Olukoju (2002), these administrative division of responsibility led to rivalry and inter divisional competition which affected the operational and port activities of the organization. In other to control the disaster, management required a series of investigations and managerial adjustments; and in 1964 the Sierra Leone Ports Authority was set up and a form of structure was also set up to run the affairs of maritime trade.

In accordance with the port act of No. 54 of 1964 and as amended in 1991, the Sierra Leone Ports Authority was set up with a mandate to manage and control all maritime related activities in Sierra Leone and to further operate the port of Freetown as well as supervise the activities of other ports in the country such as the ports of Nitty and Pepel. The SLPA was also given the power by the act to control activity of load and freight movement, supervise, improve and the facilitation of jetties, perform dredging, offer the services of pilotage, providing aids to navigation, control the light house and any other related maritime activities.

During this development stages, port management underwent particular modifications that had an adverse effect on employee morale and productivity. This was due to the

role natural resources and governance played in the 1991 – 2002 civil war in Sierra Leone. The country was faced with injustice, lack of political rights, social marginalization and ethnic divisions. In this situation, poor governance indicated the exclusion of some social groups from the growth and development process. The economy of Sierra Leone is still heavily dependent on natural resources, and new data indicates that poor governance, judicial abuse, and dissatisfaction continue to exist (Voors et al, 2017). These changes had more significant effects on the S.L.P.A. and the whole port division. The Authority's privatization is the most visible. The Sierra Leone Port Authority, the Government, the National Commission for Privatization, Bolloré Ports, and the Freetown Terminal Limited agreed into a concession deal on November 25<sup>th</sup>, 2010.

This deal related to the Container Terminal's (berths 3-6) concession to use, manage, operate, and maintain berths 3-6 and all adjacent areas, together with the fixed assets, as of March 2011. Agreements for berths 1 and 2 were finalized by Nectar Sierra Leone Bulk Terminal in September 2015 (Logistics Capacity Assessments, n.d). Also during this period some of the responsibilities were seen withdrawn from the port authority and were transferred to the Ministry of Transport, who doubles as the main supervisory ministry of the ports authority. In the year 2000, this was further segregated that led to the formation of the Sierra Leone Maritime Administration.

The Sierra Leone Maritime Administration as an independent body charged with overseeing the registration of ships and other vessels, as well as the regulation and improvement of performance and practice standards in the shipping industry in Sierra Leone, including the coastal and inland water transport system and the marine environment, it was established by a Parliamentary Act in 2000 and the Merchant Shipping Act in 2003. The Administration was also charged with the responsibility to provide safety and security at sea, certification of seafarers, pilotage, support aids to navigation and wreck removals (SLMA Act, 2000). Also the development in maritime saw a huge boost after the civil war when the home office in Freetown opened its international office in Cyprus which is called SLMARAD.

In compliance with the Sierra Leone Merchant Shipping Act of 2003, SLMARAD manages and controls the registration of international vessels. In order for the vessels listed in the register to be suitable for service and be manned with qualified marine personnel, SLMARAD conducts vessel registration and seafarer's certification programs with the goal of ensuring safety of life at sea and environmental protection.

The development of the shipping industry in Sierra Leone also saw the introduction of the Sierra Leone National Shipping Company in June, 1972 as a parastatal under the company's Act, cap 249 in the laws of Sierra Leone. It was a joint venture between the Government of Sierra Leone and A/S Ocean Transports. The corporation took over all of the stevedoring operations that had been nationalized by the government in February 1973. Negotiations between the Scanship /Allranine group and the SLNSC Management began in March of that year and culminated in the SLNSC assuming control of all of Scanship/ Allranine operations, including the incorporation of all of the Scanship's Sierra Leonean staff and some expatriates as well as all office facilities. The Ministry of Transport and Communications, which is now the Ministry of Transport and Aviation, was fully informed before this was done (S.L.N.C.A, n.d).

### 3.3 Maritime Trade Development in Sierra Leone

Every nation must certainly recognize the importance of maritime trade for the economic, political, social, and historical growth of both developed and emerging nations. The degree of marital industry advancement is directly related to the history, development, and progress of nations. Because of the strategic location of Sierra Leone, its maritime transportation industry lies at the west coast of Africa, with a coastline of 402km with a belt of mangrove swamp and runs through the south of Sherbro islands around the Atlantic Ocean (Sam-Kpakra, 2020).

By transforming local markets into national, provincial, and international core interests, an adequate and functional maritime transport framework plays a crucial role in the development of a country's market, particularly the market for international trade. This allows for very large-scale economies in regions with a potential competitive advantage, along with the creation of enormous job opportunities. The

idea of shipping serving as the engine for expanding the economy is not a novel one; Adam Smith saw the sector as one of the stepping stones to monetary expansion. He asserted that a business operating in a small town without ties to the outside world can never achieve high levels of productivity because the market there is too small to support the degree of specialization (Schumacher, 2016).

The Government of Sierra Leone recently in its effort to develop the Maritime trade sector, has signed for the expansion of berths at the main Freetown port. The berth extension which will commence shortly will be able to increase the country's regional connections. This extension project will be led by Nectar group. The government of Sierra Leone has also recently carried out a number of significant developmental measures. One of them has been to fully "oxygenate" the nation by starting a number of initiatives to modernize Freetown port, the nation's major port. As a consequence, the quayside has undergone rehabilitation work, a computerized and secure management system has been put in place, and contemporary, modified handling equipment has been delivered. The goal is to raise port facility productivity to that of the top ports on the African continent. The infrastructure of the ports was modernized by a number of companies through various construction projects (Logistics Africa, n.d). it is clear that the maritime sector is vital to the Sierra Leonean economy, considering the nation as a significant iron ore, timber and mineral producing and exporting nation.

### 3.4 Economy of Sierra Leone in the Context of World Trade

The Sierra Leonean economy is a mixed economy with a variety of natural resources in terms of characteristics, resources and human capital. Additionally, there is a tremendous capacity for financial, communication, transportation, and legal assets. Sierra Leone has a GDP of USD 3.7 Million and is ranked 160 in the ranking of GDP.

The COVID-19 outbreak has damaged Sierra Leone's economy. After increasing by 5.4 percent in 2019, it was predicted that real GDP would decrease by 2.7 percent in 2020. The fall was attributed to a drop in the mining, transportation, trade, and tourist industries as well as poor international demand for the country's main commodities,

notably diamonds. A rise in inflation to 17 percent from 14.8 percent in 2019 was predicted due to supply chain disruptions and transportation constraints. Due to a revenue shortfall brought on by decreased economic activity, the budget deficit was predicted to increase from 2.9 percent of GDP in 2019 to 5.7 percent in 2020. As a result of the drop in exports, the current account deficit increased from 13.5 percent of GDP in 2019 to 15.6 percent in 2019. Foreign exchange reserves were USD 565 million (4.2 months of import cover) at the end of September 2020 as opposed to USD 506 million (3.5 months of import cover) in 2019. By the end of 2020, the exchange rate stayed constant at SLL 9,845 per US dollar. As of 30 November 2020, the stock of public debt climbed from 70 percent in 2019 to 77 percent of GDP. The COVID-19 outbreak has increased the solvency and liquidity issues for Sierra Leone, which has led to a high risk classification for the country's debt. The nation is putting into effect a contract for an Extended Credit Facility (ECF) with the International Monetary Fund. The ECF intends to assist the government's reform effort by helping to make fiscal room so that policy initiatives may be funded (African Development Bank, n.d).

### 3.5 Common trade patterns in Sierra Leone.

This research will look in to Sierra Leone's trading pattern by understanding her involvement in trade integration to expand trading capabilities and its impacts on the economic growth. Sierra Leone's inclusion and participation in regional economic integration and international trading bodies are key factors in enlarging her trading capabilities. Such involvements have widening the recognition of the opportunities available globally to enhance Sierra Leone's trading position. Sierra Leone has established herself in regional programs such as NEPAD, ECOWAS, AU, and MRU linked with preferential trade agreements (PTA), the World Trade Organization, Bilateral Agreements, South-south cooperation and the EU (African Export and Imports Bank, 2018).

According to Biswas (2019), he mentioned that trading patterns expands a nation's trading capacities. He continued that such approach can be a nation's trading export in the Export and Promotion Investment Agency (EPIA). This agency is charged with the



responsibility to acquire all gains through coordinating, promotion and generation of domestic and international investments, develop strategic traditional and non-traditional exports variation, addition of value and small and medium enterprises support provision. This approach indicates that the pattern is contributing huge opportunities not only to domestic trade but to maritime trade and the international shipping industry.

Sierra Leone has over the years give priority to agriculture, timber production, mining, fisheries, manufacturing and support for investment promotion making the country open for export of raw materials and manufactured goods thereby increasing its international trade for sustainable and long term growth. The World Trade Organization in 2017 revealed that, the government of Sierra Leone will give open access to international investment allowing free no restrictions on exchange (WTO, 2017). All of these strategies are geared towards enhancing the manufacturing and mining industries to facilitate the promotion economic growth.

### 3.6 Sierra Leone's Strategic Position Significance to Trade.

Looking at the demography of Sierra Leone, it gives her strategic position for both domestic and international trade. She is in the position due to her location, accessibility and capacity to attract business relationship with any country globally and more essential to West African bloc. The country is open to maritime trade with any country due to her accessibility and substantial resources she holds. She is endowed with mineral resources and agricultural products which provides most of exports gains. This plays a significant role in enhancing regional trade between Sierra Leone and West Africa due to her strategic location and position. The spatial distributions, regularities, and correlations among their development-related circumstances are reflected in the spatial pattern of ports' location advantages. The present advancements of ports based on their current circumstances, including their position, accessibility to transportation, and hinterland economy, among others. Understanding the geographical patterns of port location benefits can aid in better identifying relative port advantages, positioning port functions, and developing strategic growth plans (Mau et al, 2021).

According to World Integrated Trade Solution (WITS), Sierra Leone exports 16.01% and imports 37.35% of her GDP. Konteh (2019) indicated that Sierra Leone engages in trade freely with other countries of the world, giving her the advantage to achieve economic growth due to its available resources and strategic maritime position.

### 3.7 Agriculture trading's importance in Sierra Leone

Trade-based agricultural operations are the foundation of Sierra Leone's economic expansion. Through trade, the agricultural sector has become more diverse, given women jobs to help reduce poverty rates, and boosted the home market through processes that add value (World Bank, 2018). The Government in 2018 has made efforts to diversify the agricultural production by encouraging large-scale farming investments and supporting small-scale farmers. The government of Sierra Leone was under pressure to prioritize agricultural productivity by supporting small-scale farming commercialization and establishing the foundation to draw large-scale foreign investments in agriculture as a result, agriculture accounted for 42% of the country's GDP in 2013 (Fielding et al, 2015).

According to the African Import-Export Bank, (2018), reported that the Makeni project, which is expected to cost over 400 million EUR, is a visible sign of rising agricultural output. The project, believed to encompass 10,000 acres of sugarcane plantation, is the greatest agricultural investment ever made in the nation. Therefore, among many other factors, trade has prompted the nation to continue recognizing the value of diversifying the agricultural sector for economic prosperity.

Additionally, trading has given women in the agriculture industry opportunity to earn money. By giving women jobs, trade has increased the agriculture sector's role to reducing poverty. Due to ongoing gender disparities that prevent women from being treated equally in employment across all productive sectors, FAO and ECOWAS (2018) estimate that 52 percent of women's labour and income comes from trade activities in the agricultural sector. According to a research by Palliere and Cochet (2018), given that women experience poverty more than men do nationwide, women have the opportunity to engage in income-generating activities through trade. As a

result, the nation has adopted substantial private agricultural projects that their proponents have described as synergistic partnerships to improve the creation of economic prospects for rural people, particularly women and untrained youths. Foreign investment has encouraged local farmers to increase agricultural output, which has led to the utilization of idle farms and the creation of jobs. As a consequence, agricultural productivity is increasing to create both excess for trade which will utilize maritime transportation and enough for consumption, tremendously helping women as a result.

According to the World Trade Organization (2017), the country's major industry, agriculture, has boosted contributions to the GDP from adjacent sectors including manufacturing and energy generation. Similar to this, investments in agricultural-based bioenergy are bringing significant sums of money, infrastructure, and technology to rural Sierra Leone, enabling small-scale farming to become commercialized and the government to draw sizable international investments (Mabey et al. 2020).

### 3.8 The impact of trade on Mining industry in Sierra Leone

Trade has impacted Sierra Leone's mining industry by making it possible to upgrade mining legislation, develop processes and infrastructure, diversify the industry, and achieve a fair share of command in the global market. First, trade has made it easier to analyse and improve policies that are relevant to the mining sector. Due to operations' unfavourable side effects, the mining industry's contribution to Sierra Leone's progress over the years remained obscured.

It is said by Faiyah (2020) that through enhancing national well-being, the mining sector is one of the key elements of Sierra Leone's economy. Diverse minerals found in the nation have improved the life of the citizens. The late 1920s discoveries of gold and iron ore, the 1930s discovery of diamond, the 1937 discovery of chromite, and the 1960s discoveries of bauxite and rutile are among the minerals that have been mined in Sierra Leone (United Nations, 2019). The sector has a significant impact on the political and economic life of the nation, with trade being the main driver of policy

improvement. These rules are built on inclusivity, which runs against to industry norms that favour the elites, making life simple and comfortable for thousands of locals.

The mining industry has undergone diversification thanks to trade. Notably, the nation traditionally focused on diamond mining, although trade has allowed other minerals to enter the market. By concentrating on the primary challenges its mining sector has in establishing its dominance over the various minerals, Faroh (2019) makes an argument for the existence of state engagement in economy reconstruction.

The Government of Sierra Leone is now using the mining sector to command a fair portion of global commerce as a result of trade. About 90% of the nation's yearly export profits come from this industry (Faroh, 2019). Since the nation lacks the institutions to add value to these items for local commerce, emphasis has been placed on the substantial role that mineral exports play in international trade which can boost the maritime industry. According to the United Nations Economic Growth for Africa (2017) report, the mining industry received 2.3 trillion Leone in foreign direct investment in 2016, which accounted for 9.5 percent of the nation's GDP. Nevertheless, despite the instability of the economy shaking investment levels, these recovery initiatives have consistently restored investors' trust. This demonstrates how the mining industry still controls a significant portion of global commerce, making it a crucial concern for the government of Sierra Leone.

### 3.9 Problems associated with the Maritime Industry of Sierra Leone

There are several negative issues that influence the maritime business in Sierra Leone, these negative impacts must be looked into and issues surrounding them must be understood because this industry plays a significant role in the economy of the country.

#### 3.9.1 Legal Reform and Enactment Matters

One major problem in Sierra Leone is the lack of legal framework and enactment of international conventions to properly regulate and enforce compliance. Sierra Leone has a law reform commission which includes managing laws involving maritime issues

and other aspect of laws which can be criminal, established laws and more for the purpose of their reform, development, consolidation and codification.

The Sierra Leone Maritime Administration and the Sierra Leone National Shipping Company were established to carry out Sierra Leone's shipping strategy and to consistently deliver reliable, high-quality services that are driven by the needs of the client respectively. The SLMA was given instructions to promote and develop indigenous commercial shipping in international and coastal shipping endeavours as well as to manage and advance maritime safety, security, marine pollution, and labour. In order to address vendor shipping and associated difficulties, the Merchant Shipping Act, 2003 was created. This Act, which was to be carried out by SLMA, lays forth requirements for ships operating in Sierra Leone with reference to licenses, registration, accreditation, and penalties for noncompliance. There are other administrative organizations with overlapped responsibilities in the marine sector in Sierra Leone as well. According to Ekpenyong (2018), these function overlaps need to be investigated for improved capability and outcomes.

Sierra Leone is a member state of both the International Maritime Organisation and the International Labour Organisation which has several international conventions. For instance, Sierra Leone has an international registry in Cyprus with over 400 vessels flying her flag. Enactment of international conventions from the International Maritime Organization and the International Labour Organization (ILO), such as the Standard Training of Certification and watchkeeping (STCW), Maritime Labour Convention which was recently ratified by Sierra Leone in March 2022, International Convention on Load Line and so many more can increase the fleet in the national flag thereby increasing revenue and boosting the economy of the country. The goal of the Sierra Leonean shipping initiative was to build a dynamic shipping sector that would generate income for the country and its people.

### 3.9.2 Marine Environmental Protection

The effects of marine pollution on bodies of water and beachside areas result in contamination of the planet and its surroundings. The government of Sierra Leone has placed a strong emphasis on the development of its maritime resources. A nation must overcome a number of obstacles to achieve blue growth, one of which is to safeguard the marine environment from coastal and marine pollution. Due to land- and sea-based pollution sources such as sewage pollution, industrial pollution, coastal development, habitat destruction, etc., which combined cause microbiological contamination, coastal and marine ecosystems are generally vulnerable without the proper management measures (Wahidul Alam and Xiangmin, 2019). Although Sierra Leone's maritime regions are abundant in marine resources, such as a variety of fish, pollution has a terrible impact on marine life, as well as human health. Sierra Leone currently lacks any type of maritime governance or policy to safeguard the resources from exploitation.

### 3.9.3 Human Resource and Training

Human resources play one of the most important roles in the growth of the firm in every sector, and training programs must make room for more research that would strengthen and support an industry's viability. Sierra Leone is a founding member of the Regional Maritime University in Accra, Ghana. It was founded with the aim of cooperation, especially with regards to the training of personnel to ensure the continuous and sustainable growth and development of the maritime industry in the sub-region and beyond. More than a thousand students graduated from RMU and other universities in Egypt, Russia, and the Philippines. Unfortunately, only around 5 percent of graduates have had the chance to participate in maritime training, which is essential and required for the Standard Training Certification and Watchkeeping.

More recently, IMO's 5 STCW short obligatory courses were to be conducted in the capital city of Freetown and overseen by RMU after the Sierra Leone Maritime Administration signed a MOU with them. It was placed on hold since there weren't the facilities needed to host and manage these activities. According to Badejo (2014), the

effort to update the HR division of the marine industry would fail due to inadequate training and labour capacity development, thus more thought must be given to enhancing this area.

#### 3.9.4 Financing

Maritime business is a high capital intensive business and due to its high capital requirements, the maritime sector needs substantial subsidies. Because of the high degree of commerce in a country, there is a lot of business and interest in shipping (Choy et al, 2016). Sierra Leone has yet to realize its benefit in the blue economy due to lack of the finance to equipped itself in maritime infrastructures and assets.

There are also additional problems with theft and misappropriation of cash in the maritime sector of Sierra Leone, and there are many dangers which can affect foreign investments.

#### 3.10 Impact of Maritime Trade on the Sierra Leonean Economy

Globally, the maritime sector is one that both actively and passively creates employment options. While individuals working in the sector's supplier industries are beneficiaries of the passive side of the rewards, those actively involved in the sector are reaping the rewards of the active employment creation. For instance, the maritime sector in the Philippines includes the port and maritime tourism as well as the crewing and manning business, training and education of seafarers. The economic impact is significant and hard to quantify. These play a significant role in the economy by producing jobs. In 2019, seafarers from the Philippines sent \$6.5 billion home. As it maintains and improves the level of knowledge and skills in the marine sector and ensures maritime safety, education and training of seafarers is a key component of the maritime business (Richer, 2016). In addition, a comparable survey for the UK projected that the maritime transportation industry generated over 212,000 employments in 2007 (Oxford Economics, 2009). Also in Nigeria, the maritime sector is thought to be responsible for 10% of employment opportunities in both the governmental and private sectors (Ogunleye, 2020).

In Sierra Leone, it can be estimated that the maritime industry also provides quite a number of jobs for Sierra Leoneans. The public division associated with the maritime industry in Sierra Leone includes the Sierra Leone Maritime Administration, Sierra Leone Ports Authority, National Revenue Authority, Port Health, Immigrations Office, Office of National Security, Joint Maritime Committee, Ministry of Fisheries and Marine Resources, Sierra Leone Navy, Environmental Protection Authority and other various privately owned business which are operating in the maritime sector such as shipping and fishing companies.

The maritime transport sector not only generates employment in the aforementioned sectors but also in other related industries like ship repair and maritime education and training. In Sierra Leone, Jobs in the maritime transportation sector have a knock-on effect on the development of other financial activities like cargo forwarding, shipyard work, stevedoring activities, towage, pilotage, warehousing, and freight handling, all of which depend on the maritime sector for their survival. It has also sparked informal business activities that employ Sierra Leoneans, such as small trade, selling, hawking, and more. Without the businesses and job openings this sector has produced and made available, Sierra Leone's unemployment rate would have increased, which would have led to a financial instability in the nation.

Sen (2004) alluded that any industry's financial impact on the economy is regularly calculated based on how much its contribution to the G.D.P. of the economy or country is worth. It should be noted that the idea of substantial value added to the G.D.P is not total sales or an equivalent by this sector because the total estimation of sales of an industry includes the estimation of the substantial number of data sources that have been purchased from different businesses; the entirety of definite sales across all businesses can consequently end up "enumerating" some outputs multiple times and is not used as a measure of commercial activity for the G.D.P. Rather the G.D.P, which the marine sector considers to be "added value" to commodities. The economic impact of maritime commerce has been seen to be divided into three categories in numerous research, they include the direct effect, the indirect effect, and the induced effect



(Pinfold, 2009). The maritime sector's immediate effects are obvious. The example of imported goods entering Sierra Leone and exporting goods leaving Sierra Leone is the greatest way to illustrate the concept of direct effect. A pilot boat is often used to manoeuvre a vessel into a port under the control of the boat's operator. As an example, despite having a pilot boat, the vessel can need tugs. The ship also needs to be secured by stevedores. Customs investigators and ship boarding officials board the ship after it has been secured.

Most often, the crew will spend money on either a specific person or the ship's agent. The ship's agent, a customs broker, or a cargo forwarder handle the documents. The operation of just one ship will have an influence on the economy of Sierra Leone, not only by bringing in money and opening up employment opportunities for its crew, but also by hiring stevedores, ship agents, and the crew of the pilot boat. The G.D.P. value, industry revenue and benefits, number of workers, wages, and total export make up the direct effect (Sen, 2004).

In the indirect effect, it can be seen as the inter-industry trade transactions that is created by the direct interest; Marinova Consulting Ltd (2009) considered them as the reversible link to the economy. It is the impact on the financial sector that the maritime transportation industry can have on other sectors as a result of other sectors' interest in using the sector's products and services as manufacturing inputs (Sen, 2004). To further clarify, stevedoring organizations buy or rent cars, whereas pilot boats buy gasoline from suppliers and shipyards perform repairs. Progressively foundational goods and services are purchased by the suppliers of these goods and services. Input-output analysis is mostly used to estimate the indirect effect.

While the induced effect refers to the interest or demand created in the larger economy via consumer spending of wages received from persons working in the marine industry's direct and indirect activities (Ogunleye, 2020). For instance, a decline in wages in the marine sector or one of its suppliers will result in employees spending less money, and consequently, there will be less demand for consumer goods from

other businesses. The induced impact can take a while, perhaps a year, to spread across the economy.

Even though it is frequently estimated by the level of commercial activity of an industry, as well as the value added to G.D.P. and the creation of jobs, the economic impact of an industry on the economy of a country is not just limited to these monetary activities but also the effect of this industry on various aspects of the economy. For instance, its effects on facilitating trade, business income generation, and access to funds, the development of the tourism sector, upgrading industrial enhancement and improvement, interstate connections and peaceful coexistence, social political agreement, defence and security-regional protection, and for the transportation of people across regions in a country (Mohmand and Saeed, 2017). According to a report by the Irish Maritime Improvement office (2007) stated that, the productivity of the maritime sector is closely tied to the consumer's interest and demand in the available product sector of an economy. One cannot overstate the importance of commercial activities in generating revenue for the Sierra Leone Maritime Administration. The Administration receives annually huge sums of foreign exchange from its international office in Cyprus for registration of vessels under its flag. They also generate 2% legal charge on shipping companies on all imports and exports (Merchant Shipping Act, 2003).

The SLPA also receives revenue through clearing and forwarding activities, customs charges, port fees, and levies for the use of its facilities by ships or vessels that anchor at the ports. Both SLMA and SLPA get a sizable portion of their income in foreign currency, enhancing the nation's foreign reserves. Due to the international airport's location, a significant amount of passengers is transported by boat to the capital city of Freetown. Each year, the owners of these ferries and water taxis pay taxes and registration fees to the NRA and SLMA, which also brings in money for the government. A vibrant, adaptable, successful, and productive maritime framework would enhance the crucial financial and economic functions in Sierra Leone.

## CHAPTER 4 Methodology

### 4.1 Introduction

Maritime trade is a subject that has received a lot of investigation because of its importance to economic development and general human happiness. To uncover the hidden realities and enrich the body of current literature on the issue, this study needed strong methodology.

According to Stapor (2020), and in order to find underlying patterns and trends, statisticians gather, examine, and display vast volumes of data. Every day, statistics are used in many facets of our life, including commerce, industry, health, and government, to help us make decisions that are well-informed in the face of uncertainty and variety. This research used both descriptive and inferential statistics. Descriptive statistics will help us to first identify the key characteristics of sample data from tables, charts and graphs. Then inferential statistics will enable us to make judgement about the entire sample that was taken.

Finally, we use linear regression to describe the link between the independent variable (Maritime Trade) and two dependent variables (GDP and Foreign Reserve).

### 4.2 Area of Study and Population

This study examines the connection between maritime trade and economic development in Sierra Leone using the data of GDP and foreign reserves as key financial indicators. The data collected for this research will span out for a period of 30 years, 1991 - 2020.

### 4.3 Data Collection

A primary and secondary sources of data collecting will be used in this study. Journals, books, papers, newspaper stories, internet, magazines, official documents and websites from the Ministry of Transport and Aviation, Sierra Leone Maritime Administration, Ministry of Trade and Industry, Sierra Leone Ports Authority, Bank of Sierra Leone and other primary and secondary sources will be used. This research will also utilize materials in the library of the World Maritime University, maritime commons, as well as governmental organisations and policymakers. The United Nation Conference on Trade and Development (UNCTAD), World Bank, World Economic Forum are among

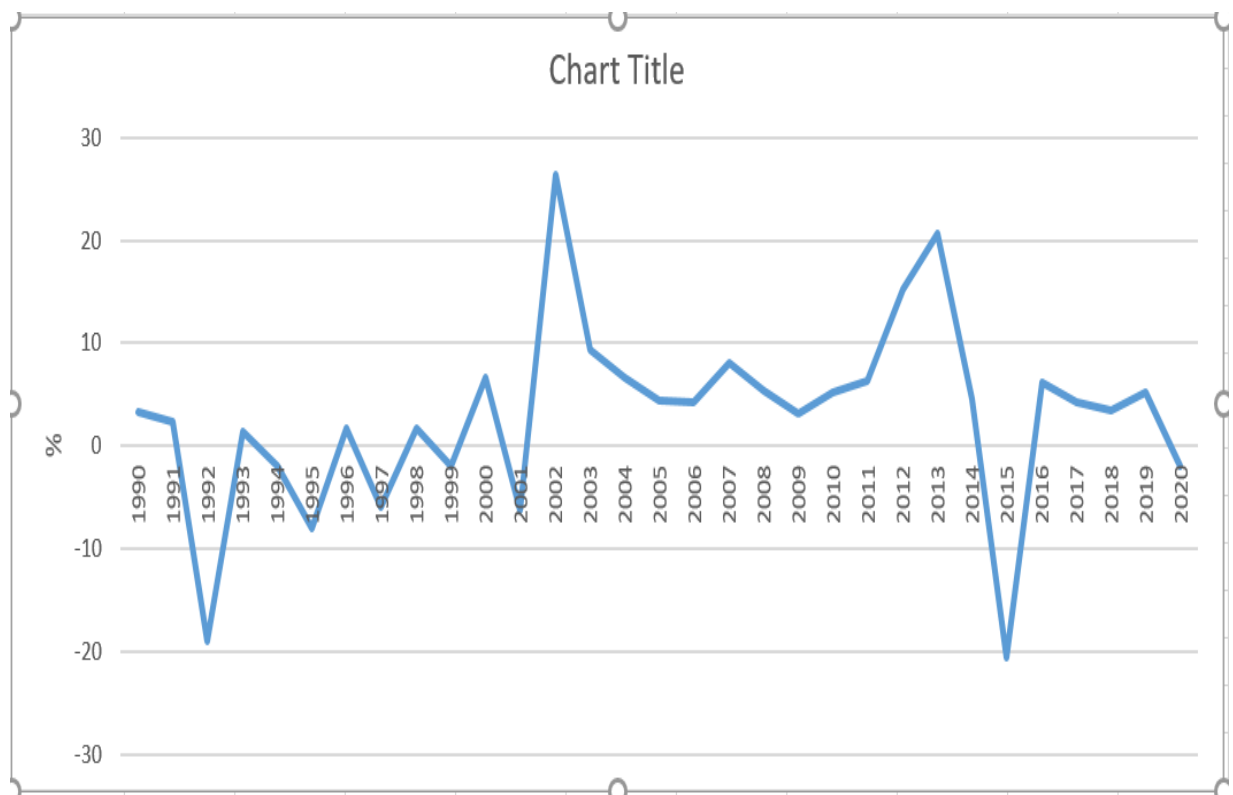
the secondary sources from which the numerical data will be taken. These data were previously gathered by maritime experts and economic analysts.

#### 4.4 Research Design and Analysis of Data

The entire value – added from all goods and services generated by a country is represented by the GDP indicator. Which is first of the dependent variable used in this research. The amount is taken from the commodities for both local and international distribution, with computations occurring annually. This value aids in the analysis and evaluation of all industrial and economic operations as well as the ability to track the dynamics of economic growth over an extended period of time.

Figure 1 shows a high volatility of Sierra Leone’s GDP per capita growth rates. It can be seen that in 2013 and 2015 there was high volatility in this period.

*Figure 4.1 Change in Sierra Leone’s GDP historical trend*



*Source: Author’s Representation from World Bank GDP Annual % (2022)*

To fully comprehend Sierra Leone's economic status, it is essential to understand historical trade changes in the nation. Since the 2000s, Sierra Leone has imported more products and services than it has exported.

This research will form some hypotheses to answer the research questions and will be analysed using a simple regression model. Regression will be used to sort the data once it has been collected. As mentioned above, simple regression will help estimate one parameter from the other parameter(s) depending on the nature of the correlation between the values. The constant variable is usually called the dependent variable because of the fact that analysing its growth depends on other parameter(s) known as independent variable(s).

Now we can describe the dependent variable as a linear function of the independent variable  $X_i$  using the formula;

$$Y = a + b_1 \times X_1 + b_2 \times X_2 + \dots + b_n \times X_n \text{-----(1)}$$

Where: Y represents the dependent variable (s)

X represents the independent variable

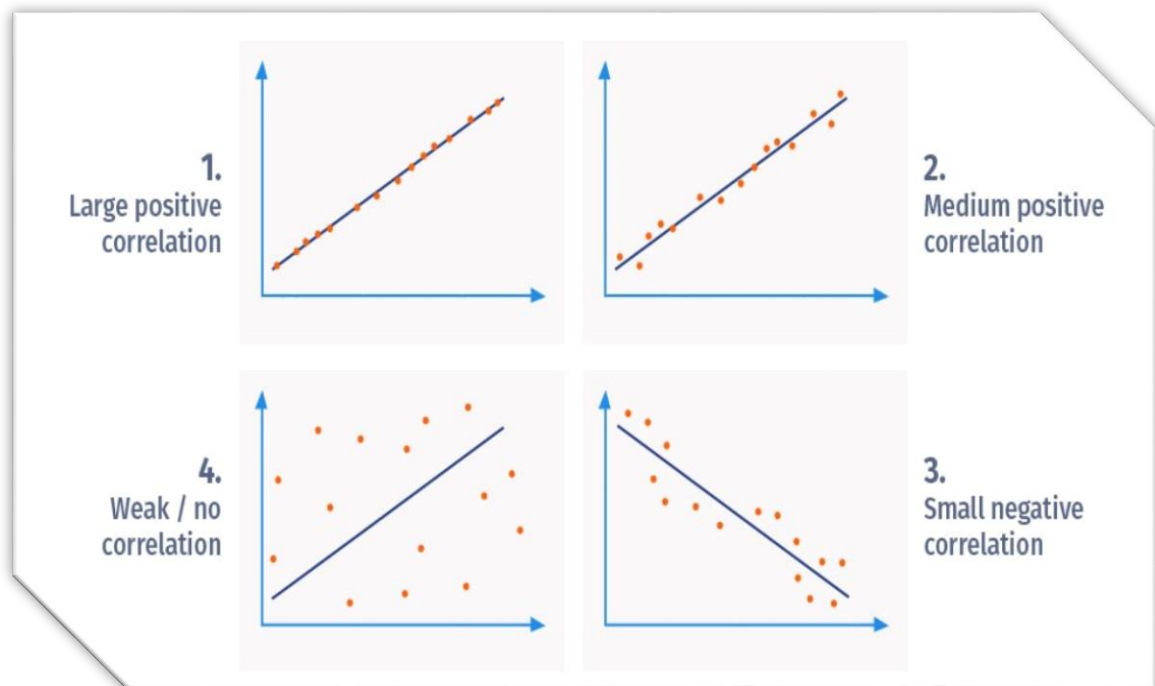
In the case of this study, maritime trade of Sierra Leone is  $X_i$  and represents the independent variable and the dependent variables Y are gross domestic product of Sierra Leone and Sierra Leone's foreign reserves. Here, the coefficient of determination expresses the entire link between the dependent variable(s) Y and the independent variable  $X_i$ .

The correlation between Y and  $b_1 \times X_1 + \dots + b_n \times X_n$  corresponds to the square of the multiple correlation coefficient.

To further investigate the link between the independent variable and dependent variables, correlation analysis will be adopted in this research. Three relationships can be established after the correlation technique is performed; a positive correlation, a negative correlation or uncorrelated. Any of these relationships can occur between two variables. In a positive correlation, it shows that the two variables being correlated move in the same direction. That is if for instance to show that when a correlation is positive and close to 1, maritime trade and GDP change the same way. That is then to show that when a correlation is negative and close to -1, maritime trade and GDP move in the

opposite direction. Meaning if there is an increase in maritime trade it will cause a decrease in the GDP. Finally, for uncorrelated variables, it shows no connection between them, any increase or decrease of one variable does not affect the other in no way.

*Figure 4.2 Graphs illustrating the three relationships*



*Source:* (2022 Question pro survey)

In this research, the impact of maritime trade on Sierra Leone's economy is examined. In order to conduct an effective analysis, the study requires the values of the independent and dependent parameters from credible data sources.

Two hypothesises are formed. The dependent variables for analysing the hypothesises are given as follows;

- GDP<sub>n</sub>
- Foreign. R<sub>n</sub>

Where;

GDP = Gross Domestic Product,

Foreign. R = Foreign Reserves,

n = in years.

Also for the hypothesis formed, the independent variable is shown below as;

Maritime. Tn

Where Maritime. Tn = Maritime Trade in year, n.

With the dependent and independent variables mentioned above, they can be used to generate the three hypotheses as follows;

### **Null Hypothesis one**

Hyp<sub>001</sub>: Assuming there is no relationship and link between maritime trade and Gross Domestic Product of Sierra Leone

Sierra Leone maritime trade values from 1990 – 2020 is representing the independent variable in the hypothesis one.

Sierra Leone GDP written as GDPn is the dependent variable in year and is expressed in the formula;

$$GDPn = f (\text{Maritime. Tn}) + e$$

i.e.  $GDPn = B1 + f (\text{Maritime. Tn}) + e$

Where B1 = the coefficient of regression

E = Error term

### **Null Hypothesis Two**

Hyp<sub>002</sub>: Assuming also there is no relationship or link between maritime trade and foreign reserves.

Taking into account Sierra Leone maritime trade values from 1990 – 2020. Also values of Sierra Leone foreign reserves for the same period as above and can be given by the formula;

$$\text{Foreign. Rn} = f (\text{Maritime. Tn}) + e$$

i.e.  $\text{Foreign. Rn} = B0 + B1 (\text{Maritime. Tn}) + e$

Where B0 = intercept of regression

B1 = the coefficient of regression

E = error term

#### 4.5 Testing Significance of Regression

In order to verify if the model definition is accurate, it is crucial to test the hypothesis. The analysis of variance technique is employed in order to achieve this. In this test, the dependent variables (GDP and foreign reserves) for the two hypotheses are split by the ANOVA with appropriate component portions.

The analytical model defining the connection between the variables must match the experimental data in order for the regression equation to be significant. It must also be determined whether the explanatory factors included in the equation are enough to explain the independent variable.

#### 4.6 Test Significance

The use of T-tests in this research is important because it is used to check the statistical significance of the found numerical values of the selected parameters after the importance of the predicted models has been assessed.

T-tests can be performed on the calculated variables of the regressors.

This can be estimated as t-ration;

T-ration =  $\beta K$  = Variables of the regressor

Se ( $\beta K$ ) = Standard error

#### 4.7 Assumptions of Linear Regression Model

In regression analysis, it is normally used for modelling the link between a dependent variable and on or more independent variable(s). the assumptions of regression model can be outlined as follows;

- Independence of Observation: Independence denotes the absence of any connection between the several samples. The technique used to acquire the data is more likely to provide an answer to this than just looking at the data.
- Hidden or Missing Variables: The linear regression model also assumes that you have included all pertinent explanatory variables in your model. If you don't, the model will attempt to assign coefficients to the variables that are present in your data set, which will result in an incorrect model. This is frequently referred to as model misspecification.



- **Linear Relationship:** The third principle of linear regression is that there must be linear relationships between the independent and dependent variables. Even though this presumption isn't often mentioned in the literature, it makes sense and should be verified. Considering your relationships are not linear, you should instead use a non-linear model.
- **Normality of Residuals:** The residuals should adhere to a normal distribution, which is the fourth principle of linear regression. Once you have your model's residuals, it is rather simple to assess this using a histogram or a QQ Plot.
- **Homoscedasticity:** When a model is homoscedastic, the error is constant throughout the range of values for the dependent variable. The best method for determining homoscedasticity is to plot the residuals against the dependent variable in a scatterplot.

## CHAPTER 5 Empirical Analysis, Findings and Discussions

### 5.1 Introduction

In this chapter, the data analysis which was mostly collected from secondary sources and it is presented together with its interpretation. In order to draw conclusions, the products exported/ imported by Sierra Leone and the last chapter's two null hypothesis are also examined. Each of the two hypotheses was tested using simple linear regression analysis.

### 5.2 Products Exported and Imported by Sierra Leone

Dry bulk and containerized exports of raw materials from Sierra Leone are well recognized. As reported by observatory of economic complexity (2020), Sierra Leone exports a significant amount of titanium (29.6%), unprocessed wood (20.4%), rough diamonds (12.5%), aluminum ore (9.31%), cocoa beans (8.88%), agricultural products and other bulk commodities in general. These are mainly exported to countries like Belgium, China, Netherlands, Romania, Germany and the United States. Sierra Leone is also recognized for importing the majority of its finished goods from countries like China, Turkey, India, the United States, the United Kingdom, the Ukraine, Germany, and France. The main imports include rice, pharmaceuticals, automobiles, cement, iron rods, wheat flour, chicken meat, and many more.

### 5.3 Presentation of Data

Here, data from 1991 to 2020 are given and used in the regression analysis that was carried out to assess the two null hypotheses. The study's correlation analysis also made use of the data. The following secondary sources provided the data primarily;

- I. United Nation Conference of Trade and Development Statistics
- II. International Monetary Fund
- III. The World Bank
- IV. Sierra Leone Maritime Administration Reports
- V. Sierra Leone Ports Authority Reports
- VI. Maritime Data Report

Table 1 presents the total maritime trade in value of Sierra Leone obtained from a secondary data source. It is derived by adding the total imports and total exports of Sierra Leone. This is done annually from 1991 – 2020.

$$\text{Total trade} = \text{Country's Exports} + \text{Country's Imports}$$

**Table 1: Sierra Leone's Total Export, Imports and Overall Maritime Trade in Millions of Dollars**

Year	Total Exports (\$'mm)	Total Imports (\$'mm)	Total Maritime Trade (\$'mm)
1991	145	163	308
1992	149	146	295
1993	118	147	265
1994	116	151	267
1995	42	133	175
1996	47	211	258
1997	17	93	110
1998	7	95	102
1999	6	81	87
2000	13	149	162
2001	29	182	211
2002	49	264	313
2003	92	303	395
2004	139	286	425
2005	158	345	503
2006	231	389	620
2007	245	445	690
2008	216	534	750
2009	231	520	751
2010	341	770	1,111
2011	350	1,717	2,067

2012	1,122	1,604	2,726
2013	1,917	1,780	3,697
2014	1,552	1,568	3,120
2015	512	1,530	2,042
2016	624	1,068	1,692
2017	567	1,301	1,868
2018	554	1,354	1,908
2019	635	1,502	2,137
2020	423	2,146	2,569

(Source: UNCTADstat)

The second table below represents the independent variable total maritime trade of Sierra Leone and the three dependent variables (GDP of Sierra Leone and Foreign reserves of Sierra Leone).

**Table 2: Sierra Leone's Total Maritime trade, GDP, Foreign Reserves and External Debt Payment**

Year	Total Maritime Trade (\$'mm)	GDP (\$'mm)	Foreign Reserves (\$'mm)
1991	308	780.1	18.9
1992	295	680.1	29.1
1993	265	769.1	41
1994	267	912	35
1995	175	871.1	27.1
1996	258	942	38.5
1997	110	850.2	44.1
1998	102	672.3	39.5
1999	87	669.3	49.2
2000	162	636.1	51.3

2001	211	1,090.4	85.1
2002	313	1,253.3	67
2003	395	1,386	125.1
2004	425	1,449	171
2005	503	1,650.4	184
2006	620	1,885.1	217
2007	690	2,158.4	220.1
2008	750	2,505.4	405.1
2009	751	2,454.1	409.1
2010	1,111	2,578	439.1
2011	2,067	2,943	478.1
2012	2,726	3,802.1	533
2013	3,697	4,920.3	601.1
2014	3,120	5,015.1	579
2015	2,042	4,219	497.2
2016	1,692	3,675.1	549.1
2017	1,868	3,719.3	501.2
2018	1,908	4,085.1	530.1
2019	2,137	4,077.1	708
2020	2,569	4,063.2	946.1

(*source:* World bank and UNCTAD)

## 5.4 Data Analysis and Null Hypothesis

### 5.4.1 Impact of Export on the Sierra Leonean Economy

Sierra Leone's total export from 1991 – 2020 was used to analyse the impact of export on the GDP of Sierra Leone.

Table 3 illustrates the test results

**Table 3: Impact of Export on GDP Results**

SUMMARY OUTPUT									
<i>Regression Statistics</i>									
Multiple R	0.83600495								
R Square	0.698904277								
Adjusted R Square	0.688150858								
Standard Error	815.9935971								
Observations	30								
ANOVA									
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>				
Regression	1	43275754.18	43275754.18	64.99368231	8.87357E-09				
Residual	28	18643675.41	665845.5505						
Total	29	61919429.59							
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
Intercept	1271.324596	190.1342394	6.686457945	2.94727E-07	881.8522619	1660.79693	881.8522619	1660.79693	
Export	2.68356928	0.332871981	8.061865932	8.87357E-09	2.001711938	3.365426622	2.001711938	3.365426622	

From the above diagram it shows the significance F – Value is less than 0.05 which signifies a positive relationship between exports and GDP of Sierra Leone. It also shows that if exports of Sierra Leone increases by (1) unit, it will lead to an increase in the GDP of Sierra Leone by 2.68 units.

#### 5.4.2 Impact of Export on Foreign Reserves of Sierra Leone

Sierra Leone’s total export from 1991 – 2020 was used to analyse the impact of export on Sierra Leone’s foreign reserves.

Table 4 illustrates the test results

**Table 4: Impact of Export on Foreign Reserves Results**

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.677062073
R Square	0.458413051
Adjusted R Square	0.43907066
Standard Error	193.4792092
Observations	30

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	887187.5158	887187.5158	23.69991644	3.97603E-05	
Residual	28	1048157.723	37434.20439			
Total	29	1935345.239				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	150.9412639	45.0824889	3.348112929	0.002334284	58.59397171	243.2885562	58.59397171	243.2885562
Exports	0.384236131	0.078926854	4.868255995	3.97603E-05	0.222561799	0.545910462	0.222561799	0.545910462

Also from the results obtained above, it shows that the significance F – Value is less than 0.05 indicating a strong relationship between exports and the foreign reserves of Sierra Leone. An increase in export by (1) unit leads to an increase in Sierra Leone’s foreign reserves by 0.38 units.

#### 5.4.3 Impact of Imports on the Sierra Leonean Economy

Sierra Leone’s total imports from 1991 – 2020 was also used to analyse the impact of import on the GDP of Sierra Leone.

Table 5 illustrates the test results

**Table 5: Impact of Imports on GDP Results**

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.937761659							
R Square	0.87939693							
Adjusted R Square	0.875089677							
Standard Error	516.432589							
Observations	30							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	54451756.26	54451756.26	204.16656	2.18496E-14			
Residual	28	7467673.333	266702.619					
Total	29	61919429.59						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	760.992628	139.1749753	5.467884052	7.73132E-06	475.9056146	1046.079641	475.9056146	1046.079641
Imports	2.091906429	0.146402991	14.28868643	2.18496E-14	1.792013497	2.391799361	1.792013497	2.391799361

Because the F- Value indicates a value smaller than 0.05 in the data, it is clear that imports and Sierra Leone's GDP have a significant relationship. An increase in exports leads to an increase in Sierra Leone's GDP by 2.09 units.

#### 5.4.4 Impact of Imports on Foreign Reserves of Sierra Leone

Sierra Leone's total imports from 1991 – 2020 was used to analyse the impact of imports on Sierra Leone's foreign reserves.

Table 6 illustrates the test results



**Table 6: Impact of Imports on Foreign Reserves Results**

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.941532348							
R Square	0.886483162							
Adjusted R Square	0.882428989							
Standard Error	88.57891409							
Observations	30							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	1715650.966	1715650.966	218.659442	9.32518E-15			
Residual	28	219694.2726	7846.224022					
Total	29	1935345.239						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	27.66588869	23.8713986	1.1589555	0.256263245	-21.23245469	76.56423207	-21.23245469	76.56423207
Imports	0.371322083	0.025111153	14.78713772	9.32518E-15	0.319884217	0.422759949	0.319884217	0.422759949

This results also indicates a significance F – Value less than 0.05 which indicates that there is a strong connection between Sierra Leone’s total imports and foreign reserves of Sierra Leone. An increase in imports by (1) unit will increase foreign reserves of Sierra Leone by 0.37 units.

#### 5.4.5 Maritime Trade’s Impact on the Sierra Leonean Economy

To determine the impact of maritime trade on the GDP of Sierra Leone, a simple regression analysis was performed. According to Null Hypothesis one in the previous chapter, it states that:

$H_{001}$ : Assuming there is no relationship and link between maritime trade and Gross Domestic Product of Sierra Leone

Table 7 illustrates the test results of Null Hypothesis one. As was previously indicated in the preceding section, the analysis was done using Microsoft Excel and an ANOVA (at a significance level of 0.5).

**Table 7: Results of Hypothesis One**

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.954087108							
R Square	0.910282209							
Adjusted R Square	0.907078002							
Standard Error	317.8464377							
Observations	30							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	28700549.44	28700549.44	284.0897171	0.00			
Residual	28	2828738.022	101026.3579					
Total	29	31529287.47						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-459.8196396	106.9374013	-4.299895395	0.000187155	-678.8709762	-240.768303	-678.8709762	-240.768303
Maritime Trade	0.680818945	0.040392792	16.8549612	3.41806E-16	0.598078061	0.763559829	0.598078061	0.763559829

#### 5.4.5.1 ANOVA Test – Significant Analysis of the Model

To verify the accuracy of the results (Significance of the statistics), we take assessment of the significance of the F and P value. The null hypothesis one in this model is rejected because the value of F is less than 0.05 (0.00003814 in this model). This signifies that we accept the alternate hypothesis indicating that there is a strong relationship and link between maritime trade and Sierra Leone’s GDP.

To further verify this results, the P-value must be lower than 0.05. In this model, the P-value is around 0.00003814 and it is lower than 0.05. Therefore, as earlier stated null hypothesis one is rejected due to the significance of the P-value. This now indicates that there is a strong relationship and link between maritime trade and the GDP of Sierra Leone.

Taking Coefficients into account;

The ANOVA gives a regression link base which indicates:

$$GDP = 0.68 \text{ Maritime Trade} - 459.819$$

In this relationship, it shows that if maritime trade increases by (1) unit then the value of GDP of Sierra Leone will increase by 0.68 unit or 68%.

#### 5.4.5.2 Correlation Method – Testing the Significance of the Model

In order to further ascertain the relationship that exists between Sierra Leone's GDP and maritime trade, hypothesis one was also examined using the correlation technique. Three relationships can be established after the correlation analysis; a positive correlation, a negative correlation or uncorrelated. Any of these relationships can occur between two variables. The null hypothesis one will be rejected if there is any positive or negative correlation between maritime trade and GDP of Sierra Leone. However, null hypothesis one is accepted if there is no correlation between maritime trade and Sierra Leone's GDP. A positive correlation exists if the correlation value is greater than 0.5 or near to 1, and a negative correlation exists if the correlation value is less than 0. However, there is no link if the correlation value is less than 0.5 or near to zero.

**Table 8: Correlation Results**

	GDP	Maritime Trade
GDP	1	
Maritime Trade	0.954229	1

From the table above, it clearly shows that there is a positively high relationship between maritime trade and the GDP of sierra Leone (0.95). On this not, null hypothesis one is also rejected after the correlation analysis.

#### 5.4.5.3 R Square Method – Testing the Significance of the Model

The R square method is also used to verify the significance of the model of hypothesis one.

The F ratio formula can be employed in this model, which is estimated as follows;

$$F\text{-ratio} = \frac{\left(\frac{\text{Regression SS}}{K - 1}\right)}{\left(\frac{\text{Residual SS}}{n - K}\right)}$$

Using the decision rule, we can now substitute the values of the results obtained in table 5.3, where K is the number of variables and n represents the number of observations in the model.

Hence it is =

$$\frac{(28700549.44)}{2828738.022/28}$$

$$= \mathbf{284.0897}$$

The F ratio value is large in this model which indicates that null hypothesis one is not true, therefore we are correct to reject null hypothesis one and accept the alternate hypothesis indicating that there is a strong relationship between maritime trade and the GDP of Sierra Leone.

#### *5.4.5.4 Significance of the Independent Variable – T-test Method*

Following the previous determination of the validity of the correlation for hypothesis one, the importance of the independent variable which is maritime trade in explaining or estimating the variations in the GDP proportion in Sierra Leone is also evaluated using a T-test.

We employed the formula;

$$t_{\text{stat}} = (\beta - c) / (Se)$$

Where  $\beta$  = Coefficient of the independent variable

c = Intercept

Se = Standard error

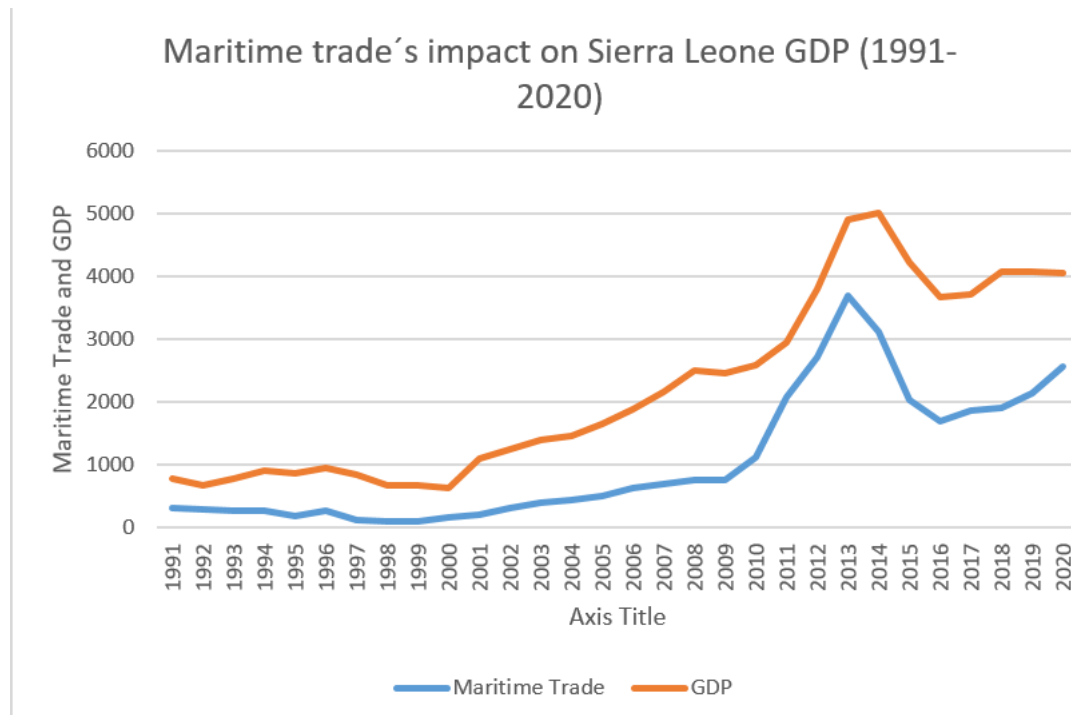
Hence substituting the values from the results in table 5.3;

$$t_{\text{stat}} = 0.6808 - (- 459.8196) / (106.9374)$$

$$= 4.306$$

A null hypothesis may be rejected when the  $t_{\text{stat}}$  that is calculated is greater than the  $t_{\text{stat}}$  on the table above (Regression statistics). In this model, the calculated  $t_{\text{stat}}$  is 4.306 and the tabulated  $t_{\text{stat}}$  is - 4.299. Therefore, the calculated  $t_{\text{stat}}$  is greater than the tabulated  $t_{\text{stat}}$ , hence hypothesis one is also rejected. We can now say, maritime trade positively increases the GDP of Sierra Leone.

*Figure 5.1 Maritime Trade's impact on Sierra Leone GDP (1991 – 2020)*



**Source:** Author's representation (UNCTAD and World Bank)

#### 5.4.6 Maritime Trade's Impact on Foreign Reserves of Sierra Leone

To also determine the impact of maritime trade on the foreign reserves of Sierra Leone, a simple regression analysis was performed. According to Null Hypothesis two in the previous chapter, it states that:

Hyp<sub>002</sub>: Assuming also there is no relationship or link between maritime trade and foreign reserves.

Table 9 illustrates the test results of Null Hypothesis two.

**Table 9: Results of Hypothesis Two**

## SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.887066442
R Square	0.786886873
Adjusted R Square	0.77927569
Standard Error	121.3683113
Observations	30

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	1522897.763	1522897.763	103.3856185	0.00
Residual	28	412447.4757	14730.26699		
Total	29	1935345.239			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	55.63450931	31.7828973	1.750454302	0.09099172	-9.469804507	120.7388231	-9.469804507	120.7388231
Maritime Trade	0.219775004	0.021614651	10.16787188	6.65624E-11	0.175499398	0.26405061	0.175499398	0.26405061

*5.4.6.1 ANOVA Test – Significant Analysis of the Model*

The significance F and P values are evaluated just as was done for hypothesis one so as to establish the statistical significance of the regression analysis. Due to the fact that the significance F-value is 0.00000656 and less than 0.05, it is implied that the null hypothesis two of this model is rejected. This signifies that we accept the alternate hypothesis indicating that there is a strong relationship and link between maritime trade and Sierra Leone's foreign reserves. To further verify this results, the P-value must be lower than 0.05. In this model, the P-value is around 0.000006656 and it is lower than 0.05. Therefore, as earlier stated null hypothesis two is rejected due to the significance of the P-value. This now indicates that there is a strong relationship and link between maritime trade and foreign reserves of Sierra Leone.

Taking Coefficients into account;

The ANOVA gives a regression link base which indicates:

$$\text{Foreign Reserves} = 55.6354 + 0.2197 \text{ Maritime Trade}$$

In this relationship, it shows that if maritime trade increases by (1) unit then the value of the foreign reserves of Sierra Leone will increase by 0.22 unit or 22%.

#### 5.4.6.2 Correlation Method – Testing the Significance of the Model

Hypothesis two was also examined using the correlation technique, this was done to further ascertain the link that exists between Sierra Leone’s foreign reserves and maritime trade. As earlier stated, three relationships can be established after the correlation analysis; a positive correlation, a negative correlation or uncorrelated. Any of these relationships can occur between two variables. The null hypothesis two will be rejected if there is any positive or negative correlation between maritime trade and foreign reserves of Sierra Leone. However, null hypothesis two is accepted if there is no correlation between maritime trade and Sierra Leone's foreign reserves.

**Table 10: Correlation Results**

	Foreign Reserves	Maritime Trade
Foreign Reserves	1	
Maritime Trade	0.885735071	1

From the table above, it clearly shows that there is a positively high relationship between maritime trade and the foreign reserves of sierra Leone (0.89). On this not, null hypothesis two is also rejected after the correlation analysis.

#### 5.4.6.3 R Square Method – Testing the Significance of the Model

Also for hypothesis two, the R square method was also used to verify the significance of the model.

The F – ratio formula is estimated as;

$$F\text{-ratio} = \frac{\left(\frac{\text{Regression SS}}{K - 1}\right)}{\left(\frac{\text{Residual SS}}{n - K}\right)}$$

We can now substitute the values of the results obtained in table 5.5

Hence it is =

$$\frac{(1522897.763)}{412447.4757/28}$$

$$= 103.386$$

The F ratio value is also large in this model which indicates that null hypothesis two is also not true, therefore we reject null hypothesis two and accept the alternate hypothesis indicating that there is a strong relationship between maritime trade and the level of foreign reserves of Sierra Leone.

#### *5.4.6.4 Significance of the Independent Variable – T-test Method*

The importance of the independent variable which is maritime trade in explaining or estimating the variations in the foreign reserves proportion in Sierra Leone is also evaluated in hypothesis two using a T-test.

We employed the formula;

$$t_{\text{stat}} = (\beta - c) / (Se)$$

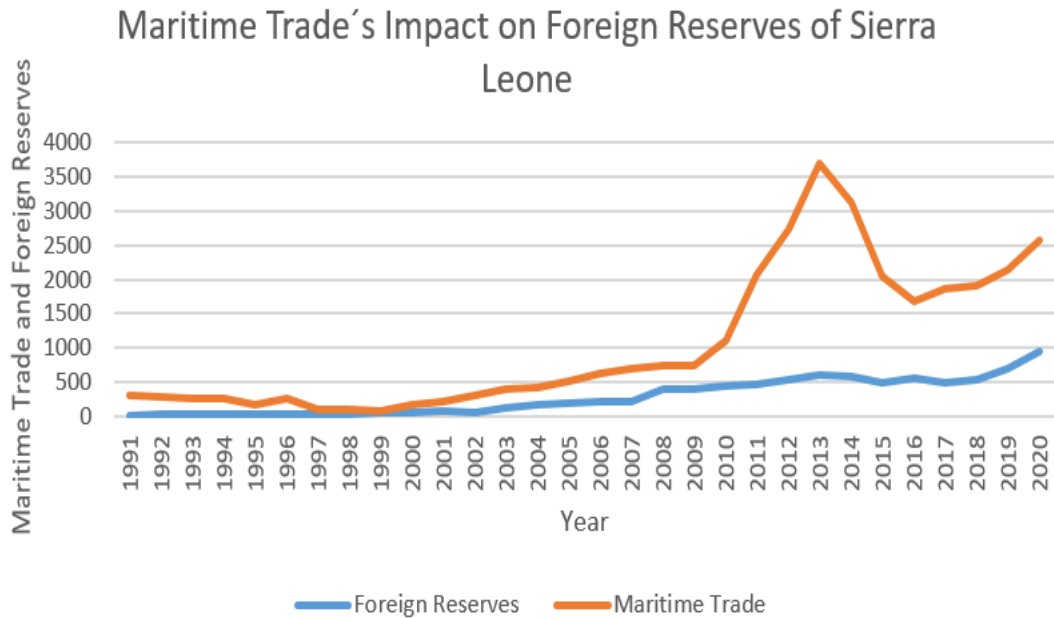
Hence substituting the values from the results in table 5.3;

$$\begin{aligned} t_{\text{stat}} &= (0.2197 - 55.634) / (31.7828) \\ &= - 1.744 \end{aligned}$$

In this model, the calculated  $t_{\text{stat}}$  is  $- 1.744$  and the tabulated P – Value is 0.00000665 which is less than 0.05, which means hypothesis two is rejected. We can now say, maritime trade has a strong relationship with the level of foreign reserves of Sierra Leone.



*Figure 5.2 Maritime Trade's Impact on Foreign Reserves of Sierra Leone*



### 5.5 Discussion of Results

The results will be discussed in summary as follows;

Exports and imports are examined separately as explanatory factors in this study. The findings indicate that Sierra Leone's exports have a favourable impact on the country's economic growth. The R Square is 0.68 according to the results obtained in the regression analysis performed. This indicates that exports accounts for about 68% of the variation in Sierra Leone's GDP during the understudied period. It also indicates that exports significantly impacts foreign reserves of Sierra Leone by 45% obtained from the R Square of 0.45 in table 5.4. The findings further indicate that imports also positively impact the GDP of Sierra Leone. Both export and imports are vital in the development of an economy. However, the GDP and foreign reserves are mostly driven by exports. Exports increase economic growth by utilizing scale economies and enlarging the productivity competition. A nation must invest a sizable amount of money in Research and innovation to provide the market with cutting-edge items in

order to expand its economy through export growth and reap its benefits over an extended period of time.

- Null Hypothesis One

According to the results of null hypothesis one, it is notable that the maritime trade significantly and favourably increases Sierra Leone's GDP. The R square is 0.91 according to the regression analysis' output illustrated in Table 5.3. This suggests that maritime trade accounts for more than 91% of the variation in Sierra Leone's GDP during the understudied period (1991 to 2020). Additionally, after allowing for biases and mistakes, the adjusted R square was around 0.907, indicating that after accounting for errors, the amount of maritime trade accounts for nearly 90% of the changes in the GDP of Sierra Leone.

- Null Hypothesis Two

The second hypothesis (Null Hypothesis Two) investigated the relationship between maritime trade and the amount of foreign reserves of Sierra Leone. Both significance tests' findings showed a substantial positive relationship between the two variables. After the results output in table 5.5, the R square value was 0.786, indicating that maritime trade rate represents almost 78% of the changes in the amount of foreign reserves. Additionally, after allowing for biases and mistakes, the adjusted R square was around 0.77, indicating that after accounting for errors, the amount of maritime trade accounts for nearly 77% of the changes in the foreign reserves of Sierra Leone.

We can now confidently answer the research questions from the various results obtained from the simple regression and correlation performed on the different null hypothesis.

From the results obtained, it is clear that any increase in maritime trade will positively increase the GDP of Sierra Leone by factor of 0.68 unit or 68%. This answers the first

question which states that: How positively does maritime trade affect the economic growth (GDP) of Sierra Leone?

Also, results obtained from hypothesis two clearly shows that an increase in maritime trade will lead to an increase in the foreign reserves of sierra Leone by 0.22 unit or 22%. This provides the answer to question two which states that: What effect does Sierra Leone's maritime trade have on the country's foreign reserves?

## CHAPTER 6 Conclusion and Recommendations

This study examined the contribution of maritime trade to Sierra Leone's economic development spanning the period, 1991 – 2020, with variables such as total exports, total imports, GDP of Sierra Leone, foreign reserves and total maritime trade taken in to consideration. The findings indicate that maritime trade is essential to the nation's economic progress and that this significance in the development process is generally acknowledged. The distribution of resources, international trade, the global value chains, and general economic growth and development are all supported by maritime trade.

This work also provides a quick summary of the study's context and provides an overview and history of maritime trade in Sierra Leone. In addition to conducting a comprehensive literature analysis on maritime trade in Sierra Leone, the theoretical and conceptual frameworks that supported the study were disclosed. The study's data, data source, research methodology, data analysis techniques, and significance testing procedures were all made available and lastly, linear regression was used to analyse the data. The findings are significant because they provide a precise numerical measure of the impact of maritime trade and investments on economic growth of Sierra Leone, which may be useful in determining the macroeconomic implications of various phenomena or rules governing maritime trade.

According to our findings, it was also shown that exports significantly increase economic growth and that despite Sierra Leone's reliance on raw materials, exports of goods continue to be a significant driver of economic growth. While government initiatives to encourage private sector investment and the export of non-traditional goods are crucial for boosting exports and maritime trade, it is also crucial to make sure that the produced goods can compete on a global scale in terms of quality and cost, with Sierra Leone having a significant potential and comparative advantages in the mining and agricultural industry. As the nation works to promote trade-driven economic growth, the government has begun to pay attention to the commodity products produced by large-scale agricultural and sustainable investments. These developments have demonstrated the beneficial effects maritime trade has on Sierra

Leoneans. As a result, the people of Sierra Leone benefit from both national and international trade strategies. According to the mercantilism idea, Sierra Leone is concentrating on growing exports rather than importing to take use of the advantages of the country's natural resources and agricultural goods.

By establishing trade patterns that will assure inclusion of all its citizens, Sierra Leone is aiming to optimize trade for economic growth. This is demonstrated by its cooperation with regional economic blocs.

From the results also it was clear that, an increase in maritime trade will result in an increase in GDP of about 0.68 units and an increase in maritime trade will also result in an increase of about 0.22 units of the foreign reserves of Sierra Leone. Thereby showing a strong positive relationship between maritime trade and the economic growth of Sierra Leone as well as her foreign reserves value.

The two developed and tested null hypotheses were important to the topic of this research. They investigated the relationship between maritime trade and Sierra Leone's GDP as well as the effect of maritime trade on the country's foreign reserves. Additionally, they identified the frameworks and policy needs necessary for the effective usage of maritime trade to support Sierra Leone's economy and provided managerial recommendations. The alternate hypotheses in the two scenarios for the null hypothesis were found to be significant at the 5% alpha level or 95% confidence level, suggesting that maritime trade has a considerable strong positive influence on Sierra Leone's GDP and foreign reserves.

## 6.1 Recommendations

From the knowledge described above and suggestions for enhancing maritime services (Ports and Shipping) in Sierra Leone, this study suggests that:

- 1) The government should diversify its exports to developing nations. It should diversify its economy to include financial industries because this will promote financial growth.

Trade globalization and financial development of the nation are dependent on increased economic growth. This makes it clear that the nation chooses to

internationalize trade and strengthen its finances along with increased economic growth.

- 2) To improve Sierra Leone's maritime trade given the country's weak institutional and policy frameworks, it is essential to develop workable policies and strong institutions. This is especially relevant in light of the study's conclusions that maritime trade has a favourable economic impact on economic growth, particularly an increase in GDP and foreign reserves.
- 3) Sierra Leone should continue to invest in the mining and agricultural sectors and create open door policies to allow foreign businesses the opportunity to invest in these sectors and promote commerce. These sectors promote maritime trade, the shipping industry and contribute to the country's overall economic growth.
- 4) The government and local government should balance investments in port infrastructure at the regional level. Increasing physical infrastructure is necessary, but improving port efficiency is considerably more crucial in maritime trade. This entails better port administration, improved interior transportation connectivity, and a quicker integration of the ports with supply chains linked to the local economy.
- 5) The development of human capital in the maritime industry needs to receive more attention. Government should support and take advantage of the opportunity offered by RMU and WMU to enable greater numbers of its people to receive high-quality training in the maritime sector, which will increase the knowledge and understanding of maritime trade.

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## Appendices

### Appendix 1

#### Information about journal articles

#### List of Researches

- See relevant researches on reference list

#### Selected researches on this project

- Articles needed to be written by academics and researchers.
- Peer reviews of articles were required.
- The journals and articles had to date between 2010 to 2020.
- Use of keywords was essential.

#### Search Engines

- Google scholar
- BASE Advanced search
- Microsoft Academic
- Maritime Commons