

**AN APPROACH TO DEVELOP A 3-LAYER HOLISTIC MARITIMIZATION  
MODEL AND ITS ANALYSIS WITH INFERENTIAL STATISTICAL METHODS**

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*To the Navy Officers who take his/her power  
from Ataturk's Maritimization Vision*

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## LIST OF SYMBOLS/ABBREVIATIONS

AD	After the Death of Jesus
BC	Before Christ
BPD	Barrel Per Day
EUR	Euro
GDP	Gross Domestic Product
GNI	Gross National Income
GVA	Gross Value Added
FP7	7 <sup>th</sup> Framework Programme for Research and Technological Development
IEA	The International Energy Agency (IEA)
IT	Information Technology
KM	Kilometers
OECD	The Organization for Economic Cooperation and Development
NGO	Non Governmental Organizations
NM	Nautical Miles
R&D	Research and Development
SPC	Statistical Process Control
SPSS	Statistical Package for the Social Sciences
TQM	Total Quality Management
UN	United Nations
US	United States
USA	United States of America
USD	United States Dollar



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## ABSTRACT

### **AN APPROACH TO DEVELOP A 3-LAYER HOLISTIC MARITIMIZATION MODEL AND ITS ANALYSIS WITH INFERENTIAL STATISTICAL METHODS**

Today, 150 of the 192 member states of United Nations (UN) are littoral states and about 50% of the world population lives around 200 km of the seaside and the exclusive economic zone reaches to 200 nm from the coast. Namely, the seas create a 300 NM living space to humankind. Seas, especially inside this 300 nm and also outside it, provide a good deal of benefits to humankind. This perspective roots base on to the 15<sup>th</sup> century to age of discovery. After 15<sup>th</sup> century, the countries such as Portugal, Spain, The Netherlands, France, United Kingdom, Germany, Japan, Soviet Union/Russia and The United States tried to obtain maritime power and sea power. These countries followed some ways by guiding some of the notions to get the maritime power. As a result of this, here in this study, it is suggested that these countries obtained *wealth, security, and innovational and libertarian thinking ability by maritime power*. While obtaining maritime power, these states followed different ways and methods. In this concept, a new model is developed in order to identify the *maritime power elements and maritimization process*. Two main approaches are used during establishing the *maritime power elements and maritimization model*: These are *3-Layer* and *Holistic* approach. *3-Layer approach* expresses three main layers: *sea surface, subsurface and sea bed*. Concurrently; *holistic approach* expresses that *maritimization model is defined like a puzzle and if one of the elements misses, the model could not be established*. The model should be evaluated holistically. Therefore, *maritimization is deemed as a process to be planned and managed holistically including all parts of maritime area with all three layers of the phenomenon which are sea surface, subsurface and sea bed called: 3-Layer Holistic Maritimization Model*. Besides, the *3-Layer Holistic Model* concludes a *maritimization process with three basic outputs: Wealth of Nations, Security of Country and Innovational and Libertarian Thinking Ability* for nations thanks to historical evidences, literature review and today's policy. In this sense, *Inferential Statistical Methods* are used to verify the idea of that a nation which reaches maritime power and survive *maritimization process*, gains *wealth, security and innovational and libertarian thinking ability*. The relation between *wealth and maritime power* is examined by analyzing the GNI (Gross National Income) data -Atlas Method-. *Liner Shipping Connectivity Index (LSCI)* and the relationship between *Capacity for Innovation (CI)* and *LSCI* are also analyzed from the sight of *Innovational and Libertarian Thinking Ability and Maritime Power relationship* via SPSS (Statistical Package for the Social Sciences) program. *Pearson Moment Correlation Coefficient* (as a parametric method) and *Spearman Correlation Coefficient* are used to analyze the relationship between the variables. Regression analysis results are displayed to show the causality relationship between the outcomes of the *maritimization and maritime power*. The results are found significant -reasonable-. In conclusion it is verified by inferential statistical methods that with the suggested *3-Layer Holistic Maritimization Model*, a nation which reaches maritime power and survive its *maritimization process*, gains *wealth, security and innovational and libertarian thinking ability* as the *maritimization's basic outcomes*.

## ÖZET

### DENİZCİLEŞME SÜREÇLERİNE YÖNELİK ÜÇ KATMANLI BÜTÜNCÜL YAKLAŞIM GELİŞTİRİLMESİ VE BU YAKLAŞIMIN İSTATİSTİKSEL METODLAR İLE ANALİZİ

Bugün, Birleşmiş Milletlere üye 192 devletin 150'si denizlere ve okyanuslara kıyısı olan ülkelerdir ve dünya nüfusunun yaklaşık %50'si ise su kenarlarının 200 km içerisinde bulunan alanlarda yaşamaktadır. Yani denizler, insanoğluna 300 nm çaplı bir yaşam alanı sunmaktadır. Denizlerin, özellikle 300 nm içi ve ayrıca dışı insanoğlunun yararına birçok fayda sağlar. Bu bakış açısının kökeni 15'inci yüzyıla, coğrafi keşifler çağına dayanır. 15'inci yüzyıldan sonra Portekiz, İspanya, Hollanda, Fransa, İngiltere, Almanya, Japonya, Sovyetler Birliği/Rusya ve Amerika Birleşik Devletleri gibi ülkeler üstünlük kazanmak amacıyla deniz ve denizcilik gücünü kurmaya çalışmıştır. Bu ülkeler denizcilik gücünü elde etmek için bazı kavramları kılavuz edinen bazı yollar izlemişlerdir. Bunun sonucu olarak, bu çalışmada denizcileşen devletlerin denizcileşmenin sonucunda zenginlik, güvenlik ile yenilikçi ve özgür düşünme yeteneğini elde ettikleri önerilmektedir. Bu ülkeler denizcilik gücünü elde ederken birçok farklı yol ve metot kullanmışlardır. Bu kapsamda denizcilik gücünün elementlerinin ve denizcileşme sürecinin tanımlanabilmesi için yeni bir model oluşturulmuştur. Denizcilik gücü elementleri ve denizcileşme modeli kurulurken iki ana yaklaşım kullanılmıştır. Bunlar “3 Katmanlı Yaklaşım” ve “Bütüncül” yaklaşımdır. 3 katmanlı yaklaşım üç ana katmanı ifade eder: Deniz yüzeyi, içi ve deniz yatağı. Buna ek olarak, bütüncül yaklaşım şunu ifade eder: Denizcileşme Modeli bir yap-boz gibi tanımlanmıştır ve eğer herhangi bir element eksikse, model kurulamaz. Model bütüncül olarak değerlendirilmelidir. Bu yüzden, denizcileşme deniz alanlarının tüm katmanları olan deniz yüzeyi, içi ve yatağını içerecek bir şekilde bütüncül bir yaklaşım ile adlandırılmıştır: “3 Katmanlı Bütüncül Denizcileşme Modeli”. Ayrıca, 3 Katmanlı Bütüncül Denizcileşme Modeli tarihsel delillere, literatür taramasına ve bugünün politik dünyasına dayanarak denizcileşme sürecini üç ana çıktı ile sonuçlandırmaktadır: *Milletlerin Zenginliği, Ülkelerin Güvenliği ve Yenilikçi ve Özgür Düşünme Yeteneği*. Bu anlamda, çıkarımsal istatistik metotları “denizcilik gücüne ulaşan ve denizcileşme sürecini yaşatan milletler zenginlik, güvenlik ve yenilikçi ve özgür düşünme yeteneğini elde ederler” fikrini teyit etmek amacıyla kullanılmıştır. Denizcilik Gücü-Refah ilişkisi; “Liner Denizcilik Bağlantısı” ve “Gayrisafi Milli Hâsıla” ilişkisi üzerinden; Denizcilik Gücü-Özgür/Yenilikçi Düşünce ilişkisi “Liner Denizcilik Bağlantısı” ve “İnnovasyon Kapasitesi” üzerinden SPSS istatistik analiz programı vasıtasıyla incelenmiştir. Pearson Moment Korelasyon Katsayısı bir parametrik yöntem olarak ve Spearman Korelasyon Katsayısı değişkenler arasındaki ilişkiyi analiz etmek için kullanılmıştır. Regresyon analizinin sonuçları denizcilik gücü ve denizcileşme süreci çıktılarının arasındaki ilişkinin illiyet bağını göstermek için kullanılmıştır. Aradaki ilişkinin anlamlı olduğu bu testler ile görülmüştür. Sonuç olarak, 3 Katmanlı Bütüncül Denizcileşme Modeli ile “denizcilik gücünü elde eden ve denizcileşme sürecini devam ettiren milletler, denizcileşmenin ana sonuçları olan zenginlik, güvenlik ve yenilikçi ve özgür düşünme yeteneğini kazanır” fikri çıkarımsal istatistiksel metotlar ile teyit edilmiştir.

# 1. INTRODUCTION

## 1.1 The Importance of Blue Waters

The relation between the water areas and humankind rely on the origin of history. About 70% of the world surface is covered with water and most of human clans that lived in the early in history selected to settle down near water areas in order to satisfy the needs. Humankind firstly used water in order to satisfy the basic requirements such as cooking, washing and fishing. Then, the rest of the horizon line is discovered as a result of the curiosity of humankind. The first maritime trade occurred about 5000 years ago and currently, 90% of the world transportation is carried out by maritime vessels. This trend will continue until a new cheaper transport type or platform is found. Today, about 50% of the world population lives around 200 km of the seaside and the exclusive economic zone reaches to 200 nm from the coast. Namely, the seas create a 300 nm living space to humankind.

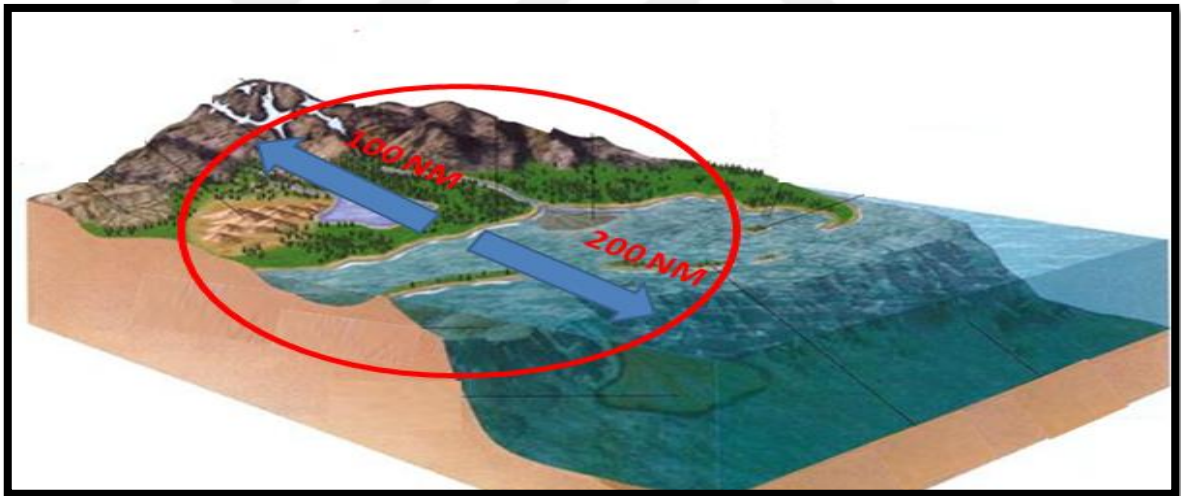


Figure 1.1. 300 NM Living Space

The realization that the world's oceans play an important role in climate regulation and many terrestrial activities, notably food production, coupled with economic changes and the rapid advancement in ocean technology have seen a shift in the perception of the importance of marine resources [1]. Today, the benefits of the oceans are palpable thus the tendency to live in the coastline and water areas continues. According to 1995 figures, as seen in Figure 1.2., Gross Domestic Product (GDP) per capita and the spatial density of economic activity measured as GDP per km<sup>2</sup> are high in temperate ecozones and in regions proximate to the sea (within 100 km of the ocean or a sea-navigable waterway). Temperate

ecozones proximate to the sea account for 8 percent of the world's inhabited land area, 23 percent of the world's population, and 53 percent of the world's GDP [2].

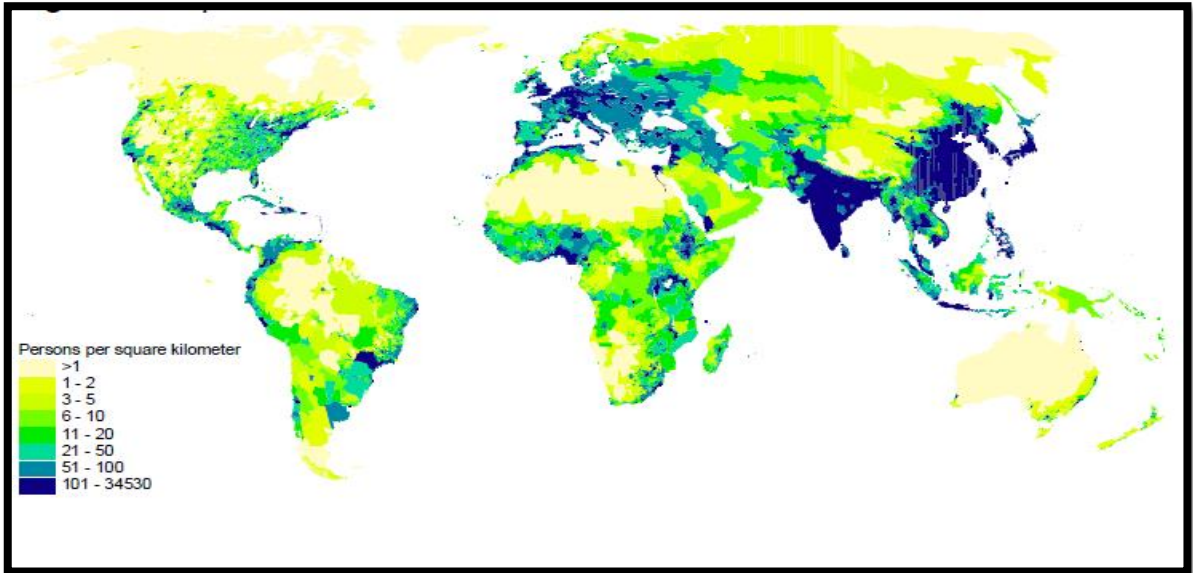


Figure 1.2. Population Distribution, 1995 [2]

On the other hand, according to 2013 figures, as seen in Figure 1.3. population gather in coastlines and especially in choke points.

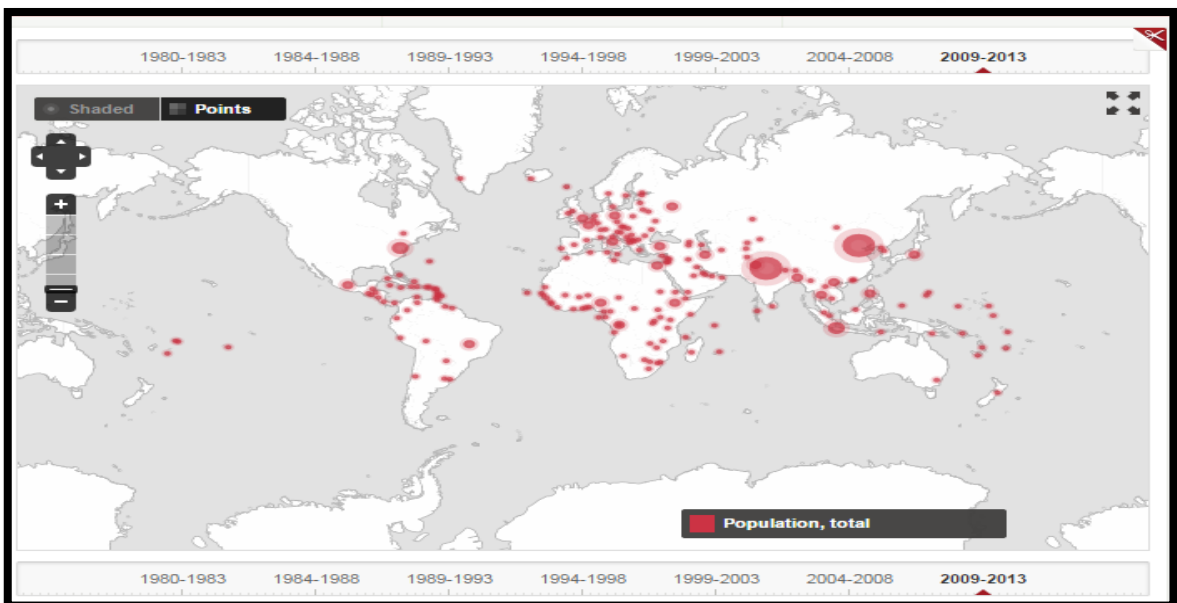


Figure 1.3. Population Distribution, 2013 [3]

But this is not a new solution. The first civilizations such as Incas, Aztecs, and Sumerian tried to settle near lake and rivers as well. On the other hand, the civilizations such as Mycenaean, Minoan, Etruscan, Carthage, Phoenicia, Ionia, Sparta, Persian and Romans used seas for trade and power projection successfully [4]. May be not all of them but

Mycenaean, Minoan and Phoenicia can be named as maritime nations from the point of their era because they used seas not only for trade but also to show their sea power capability. Many states struggled for world's hegemony during history. The states which are powerful at seas keep its power and managed the huge part of the world periodically. After the geographic discoveries era, the importance of oceans inclined. The globalization and industrial development triggered the development of technology and humankind discovered the economic benefits of oceans. After that the states tried to improve their maritime capabilities. Portugal, Spain, The Netherlands, France, Germany, Japan, the United Kingdom, Russia and the USA are the examples of countries that used navies for becoming a strong and hegemonic state and benefit from maritime economic and other sectors profits. If sea power is used as a yardstick for separating global powers form others (including regional powers), only nine qualify in the entire span of the past five centuries. These are England, France, Portugal and Spain (The four founders of global system), The Netherlands, Soviet Union/Russia, The United States, Germany and Japan [5]. Namely, all civilizations were established near the water areas and the powerful and the most important civilizations used seas and oceans in order to reach wealth and security. In this sense, another state that must be mentioned is the Ottoman Empire. It can be claimed that the first maritime vision movement for Ottoman Empire begins with "Fatih The Conqueror" because he named himself as "The Sultans of the Seas and Lands" as distinct from the former emperors that name themselves only as the lands emperors [6]. He applied a maritime policy by securing coastline and domain seas and building navies. But, this vision did not transfer to the following nations and emperors. The only period that Ottoman Empire constituted a sea power is the 14<sup>th</sup> century under the command of "Suleiman the Magnificent". This period was the most powerful period of The Ottoman Empire. But the development of the Ottoman Navy did not exist with a planned policy of Suleiman the Magnificent. Its main originator and commander was Admiral Barbarossa. He had a maritime strategic vision. The power of the Ottoman for this era is not a coincidence. Its roots base on the role of Admiral Piri Reis and Admiral Barbarossa. Especially the role of "Garp Ocakları" was significant due to maritime education system. But, the maritime strategic and scientific developments of this era couldn't evolve to a maritime culture. Maritime education system couldn't survive. Maritime trade and economic areas couldn't be used. The power of the Ottoman is limited with Mediterranean sea power and Ottoman Empire couldn't reach to the oceans. The defeat of observatory by the Admiral Kılıç Ali



Paşa at 1584 is a tragic event that sums the recession of the Ottoman Empire from the point of science and navy. Namely, Ottoman Empire couldn't institutionalize the maritime power and become a maritime nation. But, its powerful term was developed by maritime power. Another important point is Abdülaziz and Abdülhamit era. The Sovereign Abdülaziz built a navy but did not train personnel. On the other hand, The Sovereign Abdülhamit enclosed the navy to the Haliç due to political fears. In short, two of them could not manage the navy with a maritime vision. But, at that point it must be stated about the Ataturk's Maritime Vision. The navy's visit of Malta Port at 1936 is the sum of his vision. A navy which is without a ship and a trained officers at 1923, make an impressive progress by sailing in Mediterranean at 1936. This sail is the exact result of his maritime plan and vision. His vision can be summed by this statement as well:

“You also know the navy cannot be built with purchased the ships from foreign markets. Navy is not only a force to protect the coast, even more important than that, it is a force to ensure the safety of the sea routes. As long as we live in Anatolia, the need of us will be greater in this context [7]. First of all, by contenting with the provision of a core navy, we should develop our maritime industry and trade. After that it will be easy to build the navy which will gush from the industry of the country. The first five years, we pack up ourselves and make revolution, in the second five years, we introduce ourselves to the world. In the third five years we make to visit our country to the British King” [8].

This statement is the holistic view that includes policy, diplomacy, security, trade, science, industry, education and planning. This view shows that Atatürk has maritime vision and made a plan in order to establish maritime power.

Other important point is maritime transportation and trade. Most of these states built their own merchant fleet and transport their commodity by these vessels. In order to protect their trade and colonies, they built ocean navies. They used ports for the convenience of trade. Trade is the key word at that point. Their struggle is made on seas to control the world trade and get the economy over a barrel. Mahan who can be named the most important naval strategist and historian of 19<sup>th</sup> century that presented the book “The Influence of Sea Power Upon History, 1660–1783” and shaped the USA (United States of America)'s naval doctrine and mentioned his views about the relation of sea trade and wealth of state as: “The profound influence of sea commerce upon the wealth and strength of countries was

clearly seen long before the true principles which governed its growth and prosperity were detected” [9].

In this respect, the navies developed and begin to sail open seas. Namely, the term sea power existed. Besides, the role of industrial revolution and colonial policy is also important for the development of sea powers. But it is an exact view that the importance of use of sea is perceived after the 15<sup>th</sup> century. In 1476, Sir John Fortescue declared that: “And though we have not always war upon the sea, yet is shall be necessary that the king have always some fleet upon the sea, for repressing of rovers, saving our own merchants, our fishers, and dwellers upon our coasts, and the king keep always some great mighty vessels for the breaking of an army when any such shall be made against him upon the sea [10].”

After the perception of importance of seas; many views, discussions and academic researches are carried out such as Mahan. He tried to formulate and shape the hegemony and road of wealth/security of nations. Additionally, Jeremy Black mentions his views about the Maritimization process of United Kingdom: Because Britain is an island; the sea has always played a primary role in British life. The offshore waters and ocean currents ensure a rich and varied fish life, and fishing and foreign trade have played a major part in Britain’s history. The import and export of goods facilitated its achieving the economic power that played a considerable part in its expansion. Britain’s emphasis on trade contributed to the development of a sophisticated economy, in particular in the growth of the financial sector and overseas shipping, both of which in turn helped trade. Likewise, protecting trade required naval strength and commitment, the provision of which in turn fostered trade [11].

The views about this process are not limited with the United Kingdom. Another views about United States’ maritimization process is as follow: The politico-economic concept to which the United States adheres today has not changed in a century: the familiar quest for an ‘open world,’ the overriding imperative of commercial integration, confidence that technology endows the United States with a privileged position in that order, and the expectation that American military might will preserve order and enforce the rules. Those policies reflect a single-minded determination to extend and perpetuate American political, economic, and cultural hegemony—usually referred to as leadership—on a global scale [12]. E. B. Potter and Admiral Chester Nimitz (retired commander of the U.S. Pacific Fleet

in World War II) wrote his ideas about the maritimization process: The capacity of a nation to use the sea is based upon the character and numbers of its population, the character of its government, the soundness of its economy, the quality and numbers of its harbors, the extent of its coastline . . . and the location of homeland, bases, and colonies with respect to sea traffic. . . . A warring nation that has achieved a predominant capacity to use the sea is said to have command or control of the sea [which] consists of the ability to defend one's own sea communications and the ability to deny the enemy the sea communications he requires to carry on the war. . . . Bases are indispensable to naval operations for both logistic and strategic reasons . . . needed to replenish, repair and protect fleets and also to maintain them near important communications routes [13].

Germany is the other state that used seas for hegemonic struggle. To protect Germany's sea trade and colonies . . . there is only one means: Germany must have a battle fleet so strong that even for the adversary with the greatest sea power [Great Britain], a war against it would imperil [the British] position in the world. For this purpose, it is not absolutely necessary that the German battle fleet should be as strong as that of the greatest naval power because a great naval power will not, as a rule, be in a position to concentrate all its striking forces against us [14].

Japan is the other country and the discussion is carried out as well: Although Mahan wrote the sea-power script for his own country, the Japanese followed it exactly. After emerging from self-isolation in the mid-19th century, Japan became a sea power and as a result a great power: a seafaring island; the first non-western country to industrialize; determined to produce more than it consumed; increasingly dependent on foreign trade; growing stronger economically and technologically; capable of unified national purpose and commitment; relentless. During geographical discoveries period and following, these states not only export their goods but only their culture. They met with other nations and interact with new cultures. The sailors learned to sail months by struggling the weather and waves. In this context, it can be said that seas provide humankind; the soul of struggle, open mind thought and economic benefit [15].

As Mahan explained, nations with both dependence on sea-borne trade and substantial economic, industrial, and technological means will seek sea power: Great Britain, Imperial Germany, the United States, and Imperial Japan all fit Mahan's model; indeed, they read his script. Those with sufficient means but insufficient incentive—the Soviet Union, for instance—will lack the national consciousness, consensus, culture, and commitment it

takes to become true sea powers. While a prerequisite for economic success, sea power also can enlarge such success and thus augment the capacity for still greater sea power. In particular, Great Britain and Japan—neither one a land power with abundant natural resources—built “outsized” naval capabilities in order to gain economic strength and in turn support such capabilities. [15].

Building a navy, managing the trade upon sea and the support services of maritime sector consist of sea power. But, there are some other notions that support it. Topics such as national consciousness, consensus, culture, soul of struggle, open mind thought and commitment can be the examples that are mentioned by David Gompert:

The above highlights the elements and factors that made up of sea power. Gombert has only not mentioned the words that support the sea power but also maritime power’s elements such as national consciousness, consensus, culture, soul of struggle, open mind thought and commitment. Mahan identified the elements of sea power but not mentioned maritime power. During the sea power establishment process there were some notions that used the factors of sea power. For example, the government guidance, public-sea relations, geography, development of some technologies for sailing are the terms that can be picked from historical approaches.

Consequently; it could be mentioned that the countries which established maritime power got the world’s hegemony for long periods of times and obtained *wealth, security and innovative and libertarian thinking ability*. These three results’ analysis is detailed in chapter 2.6 and 3.

In this concept, the need for the understanding of maritimization, the definition of elements of maritime power is necessary. Hence, the maritime power’s elements are defined in the next chapter.

## 2. DEVELOPING A MARITIMIZATION MODEL WITH 3-LAYER HOLISTIC APPROACH

As seen in the first chapter, many countries established and survived their maritime power. They obtained the wealth, security and freedom by obtaining maritime power. While obtaining maritime power, these states followed different ways and guide different notions. In this concept, a new model is developed by guiding two main approaches in order to identify the maritime power elements and maritimization process.

Here in this study, maritimization is deemed as a process and maritime power is named as the glimpse of maritimization. The weight of maritime power could increase or decrease but the maritimization process continues.

Two main approaches are used together during establishing the maritime power elements and maritimization model: These are *3-Layer* approach and *Holistic approach*. 3-Layer approach expresses that seas include three main layers: Sea surface, subsurface and sea bed.

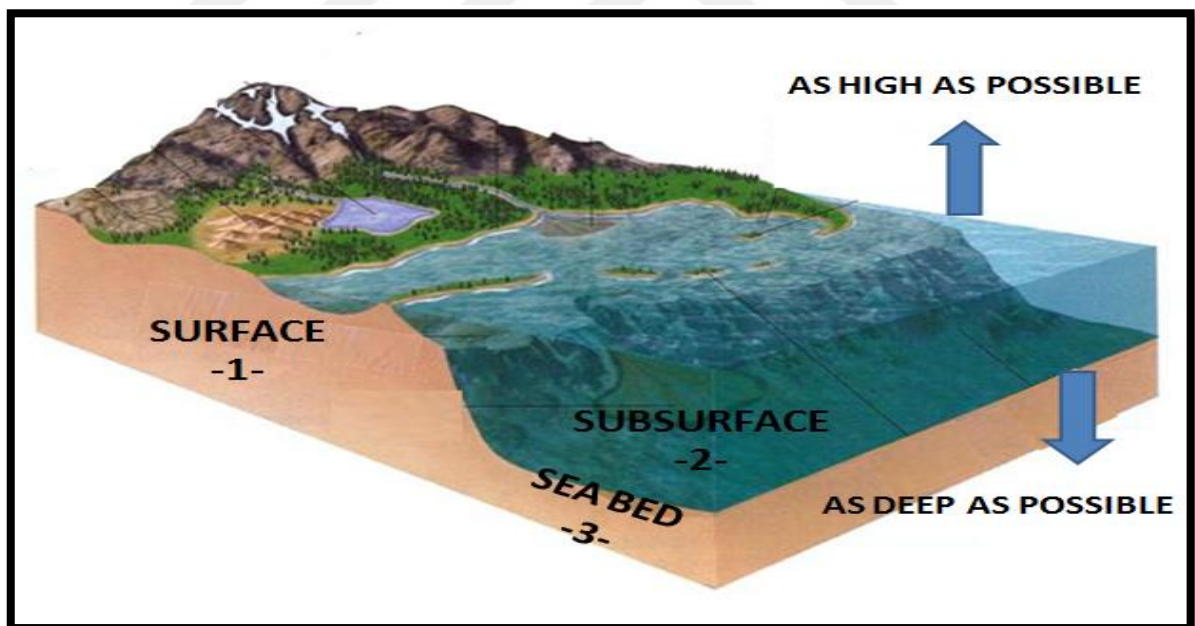


Figure 2.1. 3-Layer Approach

For example, the vessel operations which are the one part of maritime economic vision bases on surface layer. Marine fishing and seaweed base on subsurface layer and marine resources part bases on sea bed layer. In this approach, the surface could be used as high as possible and the sea bed could be used as deep as possible.

Concurrently, Holistic approach expresses that the model is defined like a puzzle and if one of the elements misses, the model could not be established. In short, the model should be evaluated holistically as in Figure 2.2.

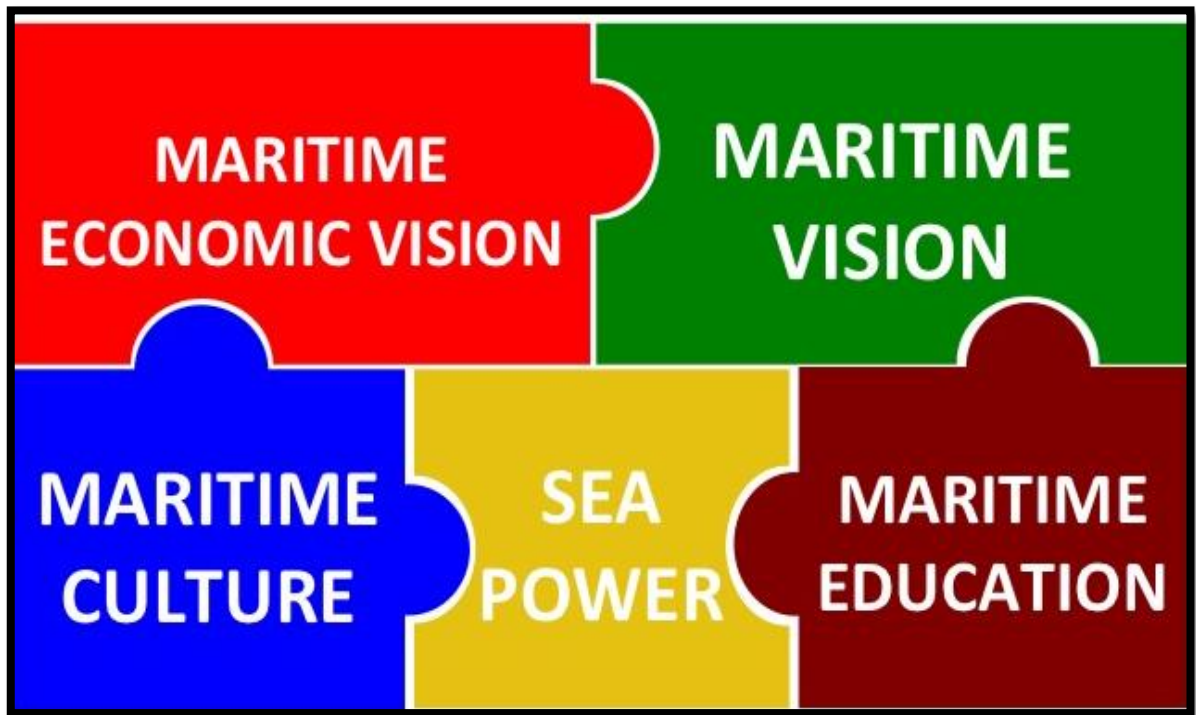


Figure 2.2. Puzzle out the Maritimization

Therefore, maritimization is deemed as a process to be planned and managed holistically including all parts of maritime area with all layers of the phenomenon which are sea surface, subsurface and sea bed called: *3-Layer Holistic Maritimization Model*. This model could be defined as a way which reaches maritime power and survives maritimization process.

3-Layer Holistic Maritimization Model includes five main elements such as Maritime Economic Vision, Sea Power, Maritime Vision, Maritime Culture and Maritime Education.

As a result of this examination, maritimization is a process that needs a long term plan and a model. This plan should be managed during a determined period and on the course of a model.

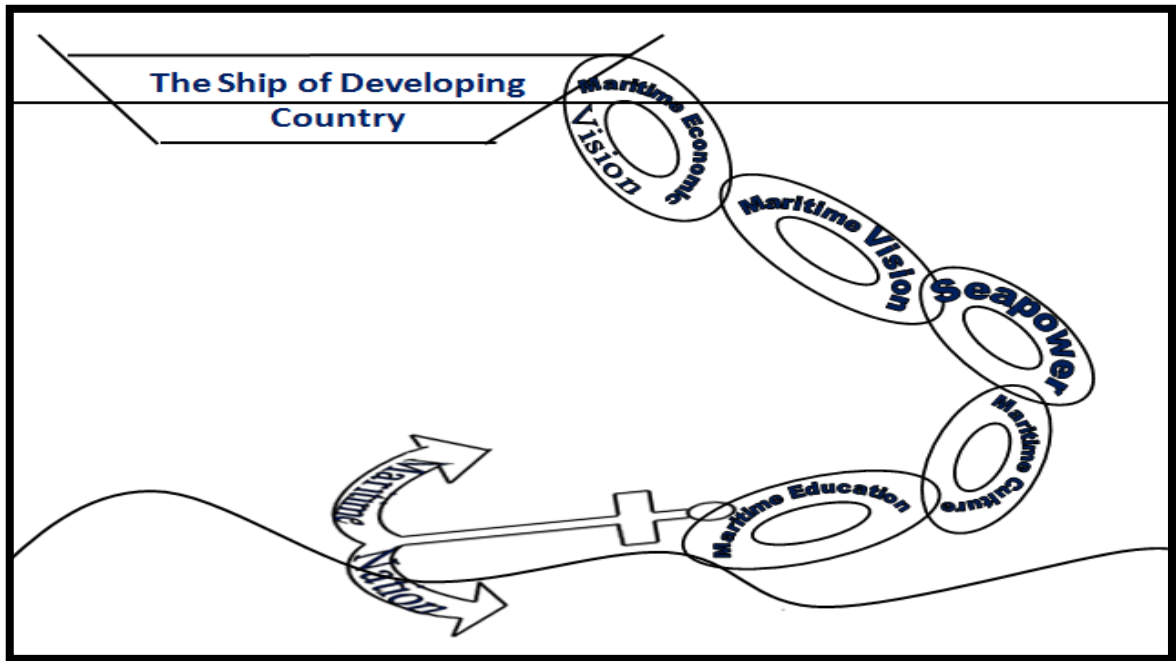


Figure 2.3. Weakness of Chain Approach for Developing Country and Maritime Nation

Besides, "Weakness of Chain" approach can be used as an other view of sight in order to figure out the phenomenon. All of the elements complete each other and the power of the model is as strong as the weakest unit.

The developing country may sail in the seas and oceans. But, if the chain is broken because of the weakness of any ring, the developing countries sailing capability drains and maritime nation topic fly off from the developing country. Hence, the country may sail and continue to develop but it can never reach its main goal.

In this concept, the 3-Layer Holistic Maritimization Model is demonstrated in the next page with the elements and the results. And the elements are detailed in the next pages.

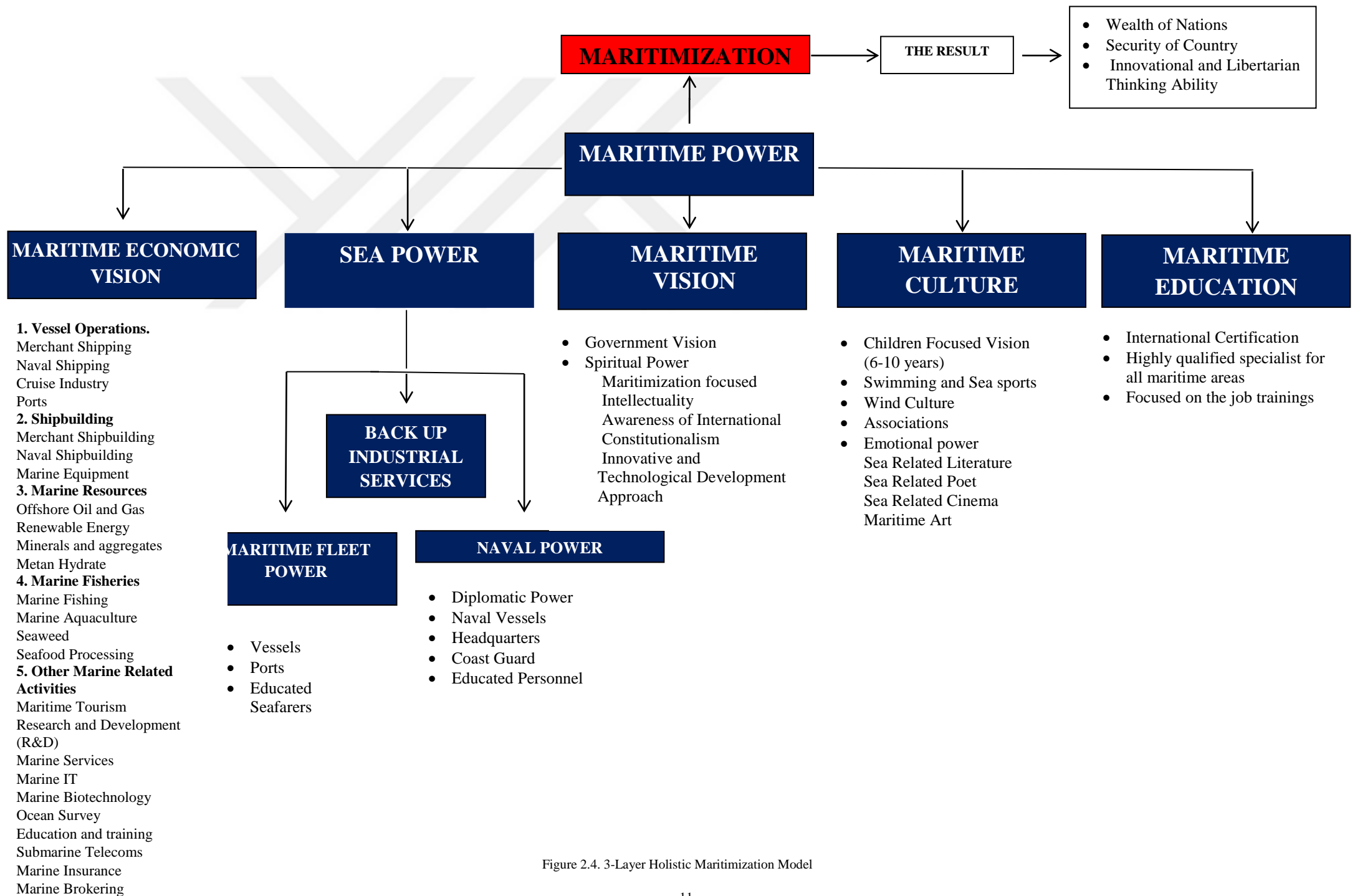


Figure 2.4. 3-Layer Holistic Maritimization Model



## 2.1 Maritime Economic Vision



Figure 2.5. Puzzle of Maritime Economic Vision

This topic is attached because economic power is so important. All relations in world begins with economy, completes with economy. In this concept, the way which reaches to a maritime nation, pass from maritime economic vision. Today, the western and pacific states are the main examples which use seas for their prosperity and security. Maritime economy areas vary from shipping to under water vehicles operations and its economical contribution. While establishing the Maritime Economic Vision's subtopic, Martin Stopford's classification type is used. It is seen that all type of maritime economic areas are listed under maritime economic vision.

- **Vessel Operations** (Merchant Shipping, Naval Shipping, Cruise Industry, Ports),
- **Shipbuilding** (Merchant Shipbuilding, Naval Shipbuilding, Marine Equipment),
- **Marine Resources** (Offshore Oil and Gas, Renewable Energy, Minerals and aggregates),
- **Marine Fisheries** (Marine Fishing, Marine Aquaculture, Seaweed Seafood Processing)
- **Other Marine Related Activities** (Maritime Tourism, Research and Development Marine Services Marine IT Marine Biotechnology Ocean Survey Education and training) [16].

Moreover, the items such as Marine Insurance and Marine Brokering are added to Other Marine Related Activities. As seen in Figure 2.6., marine economic sector has a huge potential and activity area. In this context, the importance of the oceans and the economic benefits of it detailed in this part. Figure 2.7. gives information about the Turnover Share percentage of Maritime activity areas. The 2004's maritime economic figures are used in

this study due to lack of updated economic data which shared with academic and media world.

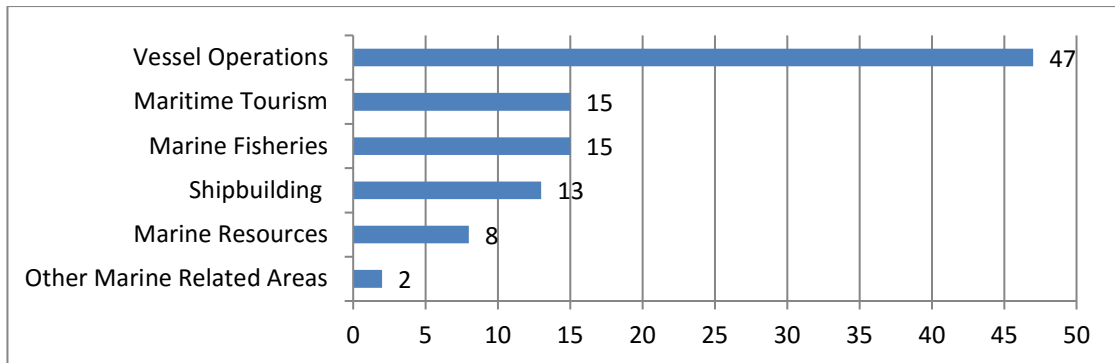


Figure 2.6. Marine Activities Turnover Share, 2004 [16]

The examination line is also listed according to the five main economic activity turnover shares in Figure 2.6. and listed according to the economic sectors in Figure 2.7. In 2004, the annual turnover of the maritime industry is about 1 trillion dollar.

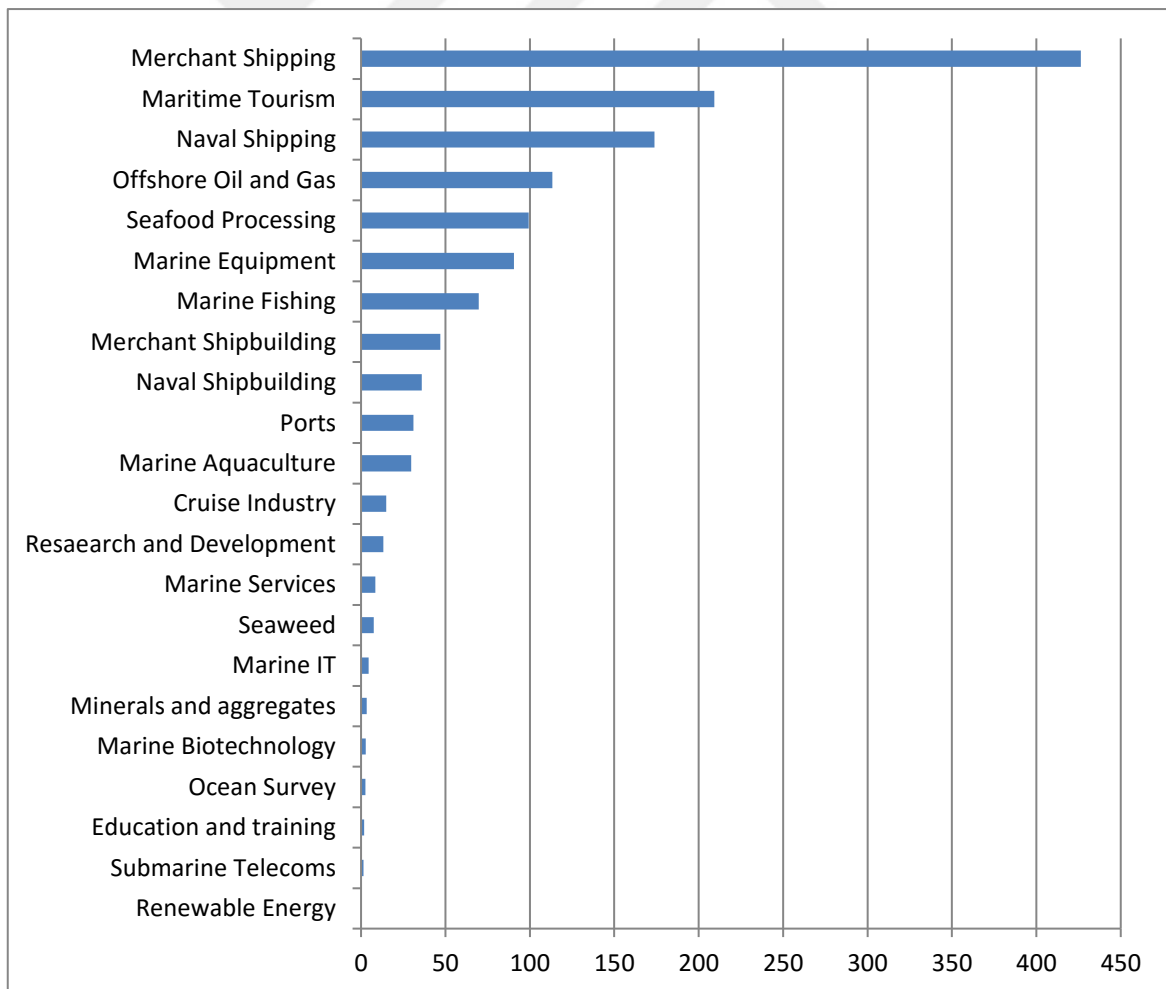


Figure 2.7. Marine Activities Turnover, 2004 (\$ billion) [16]

### 2.1.1. Vessel Operations

Vessel operations are the main activity area of marine economy and include merchant shipping, naval shipping, cruise industry and ports. In contrast, cruise industry can be named under marine tourism that can be a discussion topic. And here in this study it is examined under the marine tourism part.

The first known raft bases to 4000 BC to Egypt. After that humankind begin to use ships as a transportation vehicle. They discovered the shipment trade. The first sea trade network known was developed 5,000 years ago between Mesopotamia (the land between the Tigris and Euphrates rivers), Bahrain and the Indus River in western India. The Mesopotamians exchanged their oil and dates for copper and possibly ivory from the Indus [17]. And today over 9 billion tons of cargo is transported by maritime transportation. This cargo is transported between 20 hub ports and 20.000 ports by about 50.000 ships with 1.63 billion deadweight tonnages [18]. And maritime transportation is 3.5 times cheaper than railway, 7 times cheaper than roadway and 22 times cheaper than airway transportation. That's why about 90% of the transportation is carried out by sea. As can be seen in sea trade (Figure 2.8.), sea trade volume expands each passing year and it is seen that this development trend will continue until a new cheaper transportation type or platform is found. Since 1945 the world has seen a steady expansion of seaborne trade at around 4.8% per annum. Besides, annual turnover of merchant shipping, cruise industry and ports about half trillion US\$ according to 2004 numbers.

Naval shipping consists of its one of three [16]. Vessel operations cannot be limited with only transportation. Shipyards, ports, education centers, marine industry, bunkering, maritime support services, marine insurance, research and development, marine IT(Information Technology) and related other companies exist because of remaining maritime trade and vessel operations. The economic areas such as energy, fishing and tourism are directly related with vessel operations. Namely, the big part of maritime power covers of vessel operation and its related areas [4]. Besides, maritime transportation can be indicator about GDP and economic growth.

Figure 2.8. simply shows the graphical linear relation between the years 1975 and 2013. The GDP movement is paralel with seaborne trade.

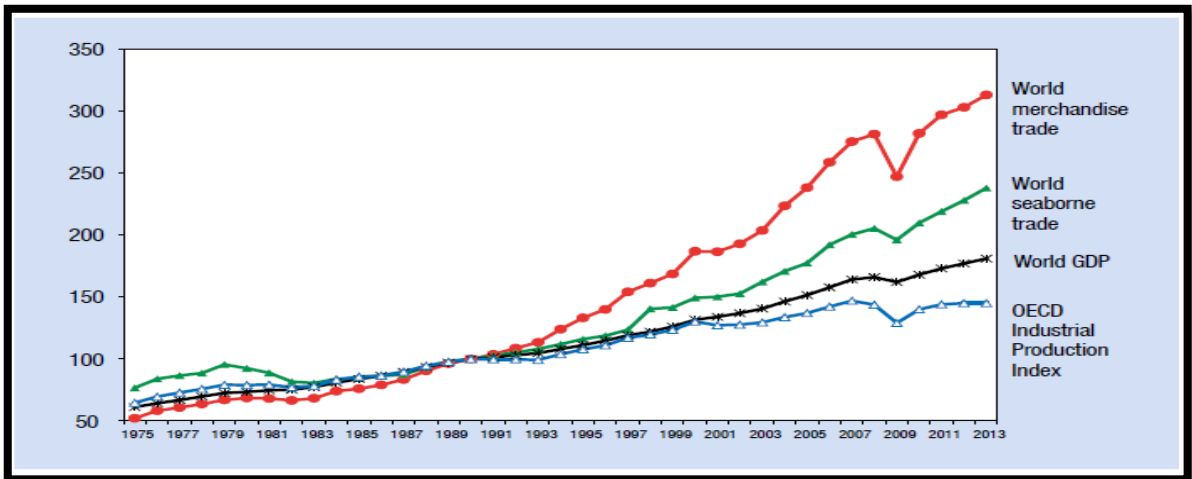


Figure.2.8. The OECD Industrial Production Index and Indices for World Gross Domestic Product, Merchandise Trade and Seaborne Shipments [19]

And in Figure 2.9. the relation between seaborne imports and GDP showed by the help of statically methods. The correlation line seems in a parallel way. This indicates a strong relation between Seaborne Imports and GDP. Here in this regression analysis  $R^2$  is 0.7118 that indicates a strong relation between Seaborne Imports and GDP.  $R^2$  indicates the ratio of explanation of the relation between two or more items with the scale of 0 and 1. In this study,  $R^2$  can explain 0.7118 part of the model. So, maritime transportation data can also be used for economic growth estimations. A clear explanation of a country's seaborne trade is the size of its economy. Common sense tells us that bigger economies are likely to generate more trade. If we examine the relationship between seaborne imports and GDP, we find there is indeed a close relationship between Seaborne Imports and GDP [16] as seen Figure 2.9.

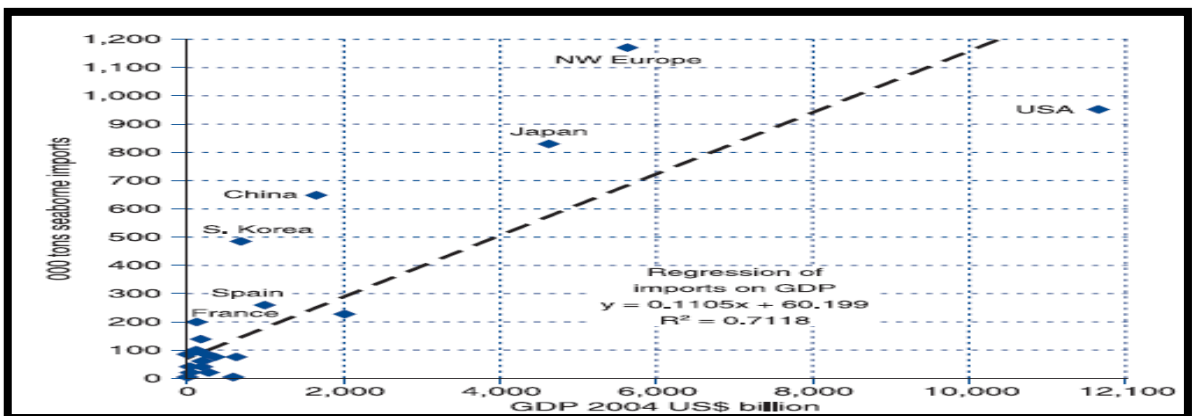


Figure 2.9. Seaborne Imports and GDP, 2004 [30]

Other vital players in maritime transportation system are the ports that functions under vessel operations. They are the connection points of hinterlands and overseas points. Currently, all transportation types are to be shaped according to ports position as well. Multimodal and door to door transportation will be new way of supply chain process and railways and roads will be constructed according to port and its hinterland. Nowadays, ports are determining the way of trade.

The containerization process is another important point. It speeds up the transportation time and lowers the cost. Namely, ports helped to reaching of the resources and commodity to their new owners and helped to growth of world wealth. On the other hand, the first steps of globalization process were occurred by the help of ports that helps the interactivity of the humankind.

The cultures of different nations are met at ports. Moreover, port development is seen as a catalyst to stimulate economic activity and create employment. In the United Kingdom, despite no longer being a major trading centre for merchandised goods, it is estimated that 262,700 jobs and £13.8 billion (\$21.5 billion) were generated in 2011 through the provision of maritime services [18].

The value added of the port cluster in Rotterdam in 2007 was calculated at EUR 12.8 billion, representing approximately 10% of regional GDP [20]. The Hong Kong port cluster generated HK\$31.4 billion (approximately USD 4 billion) of direct value. The port cluster in Hong Kong employed approximately 83,700 persons in 2011 [21].

The value added of the port of Rotterdam represented € 10.3 billion and the port of Amsterdam € 1.6 billion in 2010 added. This economic value added represents a considerable share of regional GDP, ranging from 1.8% (Amsterdam) to 10.5% (Rotterdam) in 2008. This is the weight in the total provincial economy. As the port and port-related activities are localized in a relatively restricted area of these provinces, the dominance of port-related activities in local areas is larger: the Rotterdam port cluster represented 13.2% of the metropolitan economy of Rotterdam [22].

The value added of the port clusters of Le Havre and Rouen represented around EUR 7 billion in 2005, representing 21.3% of regional GDP. Of this, EUR 4.8 billion was generated in Le Havre and EUR 2.2 billion in Rouen [23].

The biggest 10 ports of the world and the port traffic is listed as follow according to 2012 numbers.

Table 2.1. Top 20 World Ports, 2011-2012 [24]

NUMBER	PORT	COUNTRY	2012	2011
1	Ningbo&Zhoushan <sup>1</sup>	China	744	691
2	Shangai <sup>2</sup>	China	736	727,6
3	Singapore	Singapore	538	531,2
4	Tianjin	China	476	451,0
5	Rotterdam	Netherlands	441,5	434,6
6	Guazngzhou	China	434	429,0
7	Qingdao	China	402	375,0
8	Dalian	China	373	338,0
9	Tangshan	China	364,6	308,0
10	Yingkou	China	301,1	261,0
Unit : Gross weight x 1 million metric tons; 1) Ports combined in 2006; 2) Including domestic trade and river trade; China ports figures for 2012 are provisional				

As seen above the 8 of the 10 mega port is Chinese port. The 10% maritime sectors contribution to China GDP shows the importance of the ports. China is a country which has the second highest GNI in 2012. The country like that gives importance to port management and traffic. As a consequence, any developing country cannot forget the role of ports in developing trade and transportation system and its benefits to GDP. Ambarlı port facilities rank at 47<sup>th</sup> in the world in 2010 by 2.5 million TEU [25].

On the other hand, the security of maritime transportation and free trade is the other important part in nonstop flow of trade. Chokepoints are a common concept in transport geography, as they refer to locations that limit the capacity of circulation and cannot be easily bypassed, if at all [26]. The Straits of Malacca and Singapore, Bab Al-Mandab, the Suez Canal, the Turkish Straits, the Strait of Hormuz, Panama Canal, Danish Strait and

Straits of Gibraltar are the choke points that are vulnerable to disrupt the maritime traffic. In this concept, Gulf of Aden which is the meeting location of maritime trade that courses Mediterranean. As known, it is the region that most of the piracy attacks occur so that the economical dimension of stateless and unreliable transportation is detrimental from the point of free trade. The estimated costs of piracy range from \$7 - \$12 billion per year. The most significant elements of these costs arise from increased insurance premiums, the cost of re-routing shipping around threat areas and lost trade and tourism revenues for states in affected regions. In 2008 Mombasa hosted 35 cruise ships, 8 in 2009, 3 in 2010 [27]. On the other side, the stateless position of the region is not only problem form the point of piracy but also from the side of terrorisms. The threat can evolve and become more significant so that the management of secure transportation is so important. Namely, choke points and secure transportation are significant from the point of maritime transportation especially for global energy transport system. The international energy market is dependent upon reliable transport. The blockage of a chokepoint, even temporarily, can lead to substantial increases in total energy costs [28]. Middle East is the main area that the world pays attention. Especially, Strait of Hormuz and Strait of Malacca is the most important ones. 15.5-17.5 millions of BPD (Barrel Per Day) crude oil and 3.5 billions of cubic feet/day LNG transit from Strait of Hormuz. Besides, 13.6-15.0 millions of bpd crude oil transit from Strait of Malacca [29]. The importance of the choke points cannot be limited with energy transportation. Moreover all other type of cargo is transported by following main trade routes and choke points. That's why it might be easily stated that choke points are another significant part of human-water relation from the point of free flow of trade.

As a result, vessel operations consist of the main body of the maritime economic industry with its elements such as maritime and naval fleet and ports. Additionally, its contribution to GDP and employment rates is obvious. Finally, it can be said that any nation can get sufficient maritime economic benefit from seas without owning and managing vessel operations.

### 2.1.2 Maritime Tourism

Maritime Tourism is the second huge economical area of marine economic sector. It consist of 15% of marine sector. In Stopford's list maritime tourism is listed under the topic of other maritime related areas but in this study, maritime tourism examined as an independent economical topic under maritime tourism as maritime tourism consists of many specific areas, cruise industry is also reviewed.

In my opinion, these areas are supposed to be managed with a maritime vision and under one decision process. But, in many states the tourism areas are separated under different ministers and cannot seen as a maritime activity area. While tourism development has been spatially focused on the beach for much of the past 50 years, as witnessed for example, in the slogan of the four 's' of tourism: "sun, sand, surf and sex", the ocean and the marine environment as a whole have become one of the new frontiers and fastest growing areas of the world's tourism industry [30].

Today;

- Leisure Yachting
- Harbors,
- Maritime Museums,
- Scenery of the Seas,
- Lighthouses,
- Historic Fishing Villages,
- Sea Sports (surfing, windsurfing,
- Jet Waterskiing,
- Sea Kayaking,
- Scuba Diving,
- Snorkeling),
- Beach Activities,
- Cruises,
- Cliffs,
- Whale Dolphin Watching,
- Marine Wild Life,
- Aquaria



- Sea Side Restaurants and Foods can be defined in marine tourism.

Orams defines marine tourism as including ‘those recreational activities that involve travel away from one’s place of residence and which have as their host or focus the marine environment (where the marine environment is defined as those waters which are saline and tide-affected)’[31]. Nevertheless, coastal tourism which consists of sun, beach, sea and comfortable hotels can be named the biggest activity area of marine tourism. The origins of tourism in coastal areas go back to Roman times, when the first villas were constructed in the Southern part of the Apennine peninsula [32] and still continues. In 2012, there were 534 million tourist arrivals in Europe, which is 17 million more than in 2011 and 52% of all international arrivals worldwide. Revenue generated by inbound tourism reached € 356 billion, which is 43% of the world total. It employs almost 3.2 million people, generating a total of € 183 billion in gross value added and representing over one third of the maritime economy [33]. Cruise industry is one of the main marine tourism sectors as well. Over the ten years from 2002 to 2012 demand for cruising worldwide has more than doubled from 11.1 million passengers to 20.9 million (+88%) with 2.5% growth achieved in 2012 [34]. Naturally, it has an economic impact. In Europe, the total economic impacts of the cruise industry included the following: €37.9 billion in total output, €15.5 billion in direct spending by cruise lines and their passengers and crew, 326,904 jobs, and €10.1 billion in employee compensation. These impacts are the sum of the direct, indirect and induced impacts of the cruise industry. In summary, each €1 million in direct cruise industry expenditures generated: €2.45 million in business output, and 21 jobs paying an average wage of nearly €31,000 [34].

Table 2.2. Total Economic Impacts of the European Cruise Sector by Industry, 2012 [34]

<b>Industry</b>	<b>€ Output Million</b>	<b>Jobs</b>	<b>Compensation € Million</b>
<b>Agr., Mining &amp; Constr.</b>	€ 2,328	€ 16,824	€ 324
<b>Manufacturing</b>	€ 13,065	€ 72,942	€ 2,285
Nondurable Goods	€ 4,468	€ 19,036	€ 693
Durable Goods	€ 8,597	€ 53,906	€ 2,132
<b>Wholesale &amp; Retail Trade</b>	€ 2,236	€ 29,443	€ 516
<b>Transportation &amp; Utilities</b>	€ 8,305	€ 103,742	€ 3,009
<b>Hospitality</b>	€ 1,252	€ 16,768	€ 371
<b>Financial and Business Services</b>	€ 8,856	€ 62,459	€ 2,258
<b>Personal Services &amp; Govt</b>	€ 1,822	€24,726	€ 764
<b>Total</b>	€ 37,864	€ 326,904	€ 10,067

Leisure yachting is the other important marine tourism area. It employs 372.000 people and its Gross Value Added in maritime industry is €38 billion in EU [33]. In this concept it is easily said that marine tourism has positive social-cultural and economic impact. Maritime and coastal tourism generates new job areas and contribute to develop of GDP. Besides, it provides interactivity of the people by visiting new areas and meeting with new people so that the social-cultural effect of it cannot be ignored. Besides, the classic tourism vision is changing. Currently, Tourism is limited with sun and sand. Tourism should be revised and reevaluated with the topics of Harbors, Maritime Museums, Scenery of the Seas, Lighthouses, Historic Fishing Villages, Sea Sports (surfing, windsurfing, Jet Waterskiing, Sea Kayaking, Scuba Diving, Snorkeling), Beach Activities, Cruises, Cliffs, Whale Dolphin Watching, Marine Wild Life, Aquaria, Sea Side Restaurants and Foods as mentioned above.

### **2.1.3. Marine Fisheries**

Fishing was the first step of using seas as a source of food. But today, fishing is an industry that provides food, nutrition and animal protein to expanding human population. Besides, according to Stopford data in 2004, it consists of 15% of the maritime economic sector. Marine fisheries include Marine Fishing, Marine Aquaculture, Seaweed and Seafood Processing. Capture Fisheries and Aquaculture supplied the world with about 148 million tons of fish in 2010 (with a total value of US\$217.5 billion), of which about 128 million tons was utilized as food for people, and preliminary data for 2011 indicate increased production of 154 million tons, of which 131 million tons was destined as food. World per capita food fish supply increased from an average of 9.9 kg (live weight equivalent) in the 1960s to 18.4 kg in 2009, and preliminary estimates for 2010 point to a further increase in fish consumption to 18.6 kg [35].

Seaweed, aquaculture and seafood processes are the new industries that emerge under favor of seas and oceans. World aquaculture production attained another all-time high in 2010, at 60 million tons (excluding aquatic plants and non-food products), with an estimated total value of US\$119 billion. When farmed aquatic plants and non-food products are included, world aquaculture production in 2010 was 79 million tons, worth US\$125 billion [35].

Moreover, the total value of farmed aquatic algae in 2010 is estimated at US\$5.7 billion, while that for 2008 is now re-estimated at US\$4.4 billion. And in 2010, world trade in fish and fishery products reached to US\$ 109 billion [35].

As a source of resources, the sea was crucial to the development of world civilization and it remains crucial since the mankind still harvest some 20 per cent of its daily protein from the oceans [36].

World Fisheries and Aquaculture Production and Utilization data is summed in table 2.3. as follows:

Table 2.3. World Fisheries and Aquaculture Production and Utilization, 2006-2011

<b>PRODUCTION</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>CAPTURE</b>						
Inland	9,8	10	10,2	10,4	11,2	11,5
Marine	80,2	80,4	79,5	79,2	77,4	78,9
<b>Total Capture</b>	<b>90</b>	<b>90,3</b>	<b>89,7</b>	<b>86,6</b>	<b>88,6</b>	<b>90,4</b>
<b>AQUACULTURE</b>						
Inland	31,3	33,4	36	38,1	41,7	44,3
Marine	16	16,6	16,9	17,6	18,1	19,3
<b>Total Aquaculture</b>	<b>47,3</b>	<b>49,9</b>	<b>52,9</b>	<b>55,7</b>	<b>59,9</b>	<b>63,6</b>
<b>TOTAL WORLD FISHERIES</b>	<b>137,3</b>	<b>140,2</b>	<b>142,6</b>	<b>145,3</b>	<b>148,5</b>	<b>154</b>
<b>UTILIZATION</b>						
Human Consumption	114,3	117,3	119,7	123,6	128,3	130,8
Non-Food Uses	23,0	23,0	22,9	21,8	20,2	23,2
Population( Billions)	6,6	6,7	6,7	6,8	6,9	7
Per Capita Food Fish Supply (Kg)	17,4	17,6	17,8	18,1	18,6	18,8
Notes: Excluding aquatic plants. Totals may not match due to rounding. Data for 2011 are provisional estimates.						

The other topic is the consumption of the fishes. It indicates the consciousness of the region and the states about the sea as a food and a protein source. Of the 126 million tonnes available for human consumption in 2009, fish consumption was lowest in Africa (9.1 million tonnes, with 9.1 kg per capita), while Asia accounted for two-thirds of total consumption, with 85.4 million tonnes (20.7 kg per capita), of which 42.8 million tonnes was consumed outside China (15.4 kg per capita). The corresponding per capita fish

consumption figures for Oceania, North America, Europe, and Latin America and the Caribbean were 24.6 kg, 24.1 kg, 22.0 kg and 9.9 kg, respectively [37]. As for Turkey, the fish consumption is 7 kg [38]. As a result, fishing is a kind of maritime economic area that provides financial contribution and employment field to the nations. Besides, it increases the interaction of nations with sea and provides nutrition and protein which is significant for human health. This industry can be a more important food source in the near future due to global drought and give more benefits to the nations. Namely, any nation in the way of Maritimization should not ignore marine fisheries.



#### **2.1.4 Shipbuilding**

Shipbuilding is a sector that exists from the building of first ship. But from that day to now, the conditions of the industry is exactly changed. Many states perceive this industry as strategic because of their security and industrial stability. Most economies, and particularly those that are rapidly developing, consider industrial capacity as a cornerstone of their economic development. In this context, “industrial capacity” is defined as the ability of the national industrial sector to sustain manufacturing of a wide ranging group of intermediate and end products; for example, steel production, car manufacturing and shipbuilding [39].

In this concept, many states focus on this sector and some of them such as EU states, Japan, South Korea and China dominate the industry and get the financial profit of the sector periodically. In 2009, China exported ships and boats to 159 countries and regions, mainly to Asia (Singapore, Hong Kong) and Europe (Germany). Gross Industrial Output Value of the same year was 548.4 billion Yuan. The average growth rate between 2004 and 2009 was near 43% [40]. In 2011, on a national basis, the U.S. shipbuilding and repairing industry directly provided 107,240 jobs. Including direct, indirect, and induced impacts, approximately 402,010 jobs were associated with the industry. Total labor income associated with all direct, indirect, and induced jobs was \$23.9 billion. The industry directly and indirectly was associated with \$36.0 billion in GDP in 2011 [41].

And currently, EU countries are trying to get the market leadership and gain a new important position again. Leadership 2015 – the strategy of the European shipbuilding industry document is prepared for this purpose. Moreover, the special purpose vessel focusing idea of EU is to realize the same purpose as well. European shipyards supply more than 100,000 direct jobs for a highly skilled labour force, generating an annual turnover of 30 – 40 billion Euros. Ship and off-shore construction repair and conversion activities in Europe are conducted by more than 400 companies – smaller and bigger specialized repair shipyards. The annual turnover of the European repair shipyards exceeds 3.5 billion Euros, and shows systematic increasing tendency [42].

In this concept, the factors which maintain the way of shipbuilding are so important. Hence, the factors affecting the shipbuilding industry can be divided in two groups: macro factors (world seaborne trade, oil prices, economic stability, and political stability) and market factors (subsidies by the government, scrapping of old vessels, charter rates, vessels on order) [43]. The next factors determining competitiveness of particular shipyard is the

productivity, production range, and attractiveness of product, subsidy rate, exchange rate and cost position [44]. These factors should be known and the long term plans should be done by caring these factors.

As a result, shipbuilding industry can be defined as essential from the point of economy, employment, technological development and security of the nations. It consists of about 15% of maritime economy. Hence, the states in the way of maritimization country are supposed to focus on to increase its market share and create new technologies.



### **2.1.5. Marine Resources and Future Energy**

Nutrients such as fish are not the only sources which the oceans tender to the humankind. Oceans are also vital energy for human from the bottom up to the surface. Oceans do not consist of only surface layer.

The successful maritime management way passes to be able to see oceans with a 3-layer approach. Namely, marine resources can be detailed as offshore oil and gas energy, renewable energy, minerals and aggregates. Fossil fuels such as oil and gas are the main energy resources that can be extracted from offshore ocean areas.

The main point is the disproportion between the production and consumption of energy. Oil is heavily started to utilize after second half of 20<sup>th</sup> century. But in the last 20 years the consumption speed rise up exponentially due to development in technology and human needs.

Besides, this consumption size will continue by growing. Energy consumption around the world has risen by about 70 per cent over the past three decades. The International Energy Agency (IEA) in Paris estimates that consumption will increase by at least another 50 per cent by 2030 [45].

At that point, a problem about the oil reserves which are on land emerges. Are these reserves are sufficient for the future or not? The consumption trend shows that energy focusing will move to bottom of oceans to offshore areas. The conventional oil reserves – i.e. those which can be recovered easily and affordably using today’s technology – are estimated to be a good 157 billion tonnes. Of this amount, 26 per cent (41 billion tones) are to be found in offshore areas. In 2007, 1.4 billion tones of oil, the equivalent of about 37 per cent of annual oil production, were derived from the ocean [45].

Many experts estimate that oil supply will start to diminish in the upcoming 10 or 20 years. This is named as “peak oil”. If the oil on land get scare, the offshore oil will become more important. So, it is easily said that the future is under the oceans.

The onshore and offshore oil reserves are detailed in Figure 2.10. according to 2007 numbers. It can be easily said that the balance will outweigh to the side of offshore in the next decades.



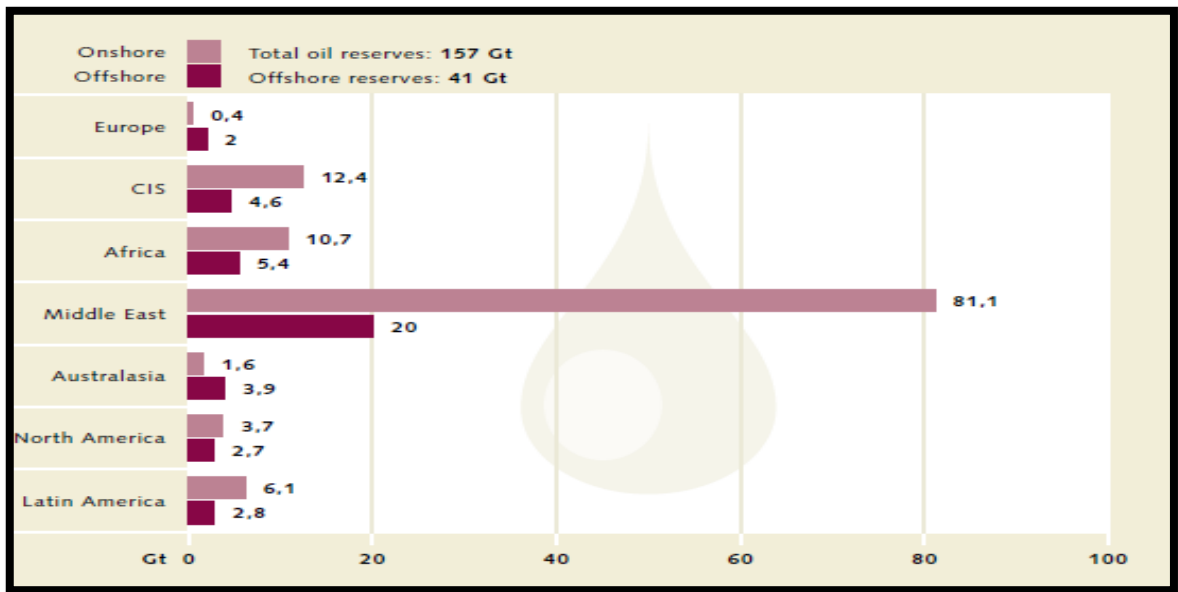


Figure 2.10. Geographic Distributions of Conventional Oil Reserves Onshore and Offshore, 2007 [45]

The geographic distributions of conventional natural gas reserves are also detailed in Figure 2.11. as onshore and offshore.

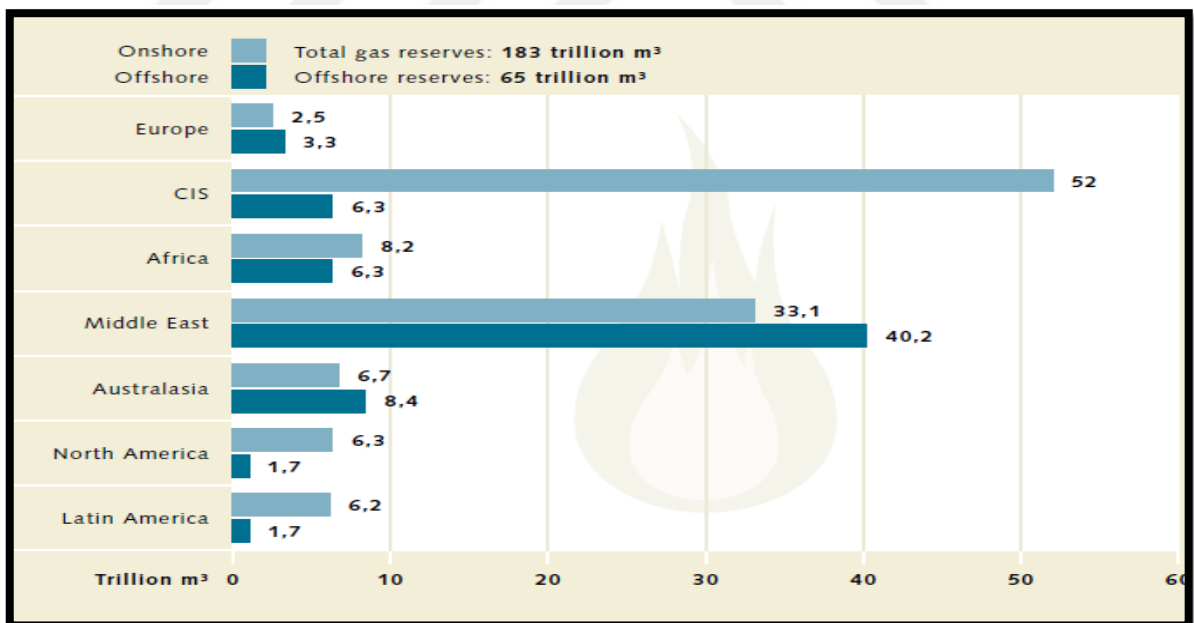


Figure 2.11. Geographic Distributions of Conventional Natural Gas Reserves Onshore and Offshore, 2007 [45]

Natural gas is the other crucial energy source for industry and life of human. The proved reserve of natural gas at the end of 2012 was 187.3 trillion cubic meters. In 2012 global consumption was about 3.3 trillion cubic meters [46]. Offshore gas production of 65 trillion cubic meters currently accounts for a good third of the worldwide total, and this figure will continue to rise. Between 2001 and 2007 it grew by just under 20 per cent, of

which about a quarter each came from the North Sea and Australasia, and about 15 per cent from the Gulf of Mexico and the Middle East. As with oil, the trend is clear: offshore production is growing more strongly than onshore production [45].

As a result, there is no exact anticipation about the time of exhaustion of oil and natural gas reserves but it is definitely that offshore reserves will be the near future new energy sources. But the resources of oceans are not limited with oil and natural gas. There is another energy resources named: Methane Hydrates. Methane Hydrates are white, ice-like solids that consist of methane and water.

The methane molecules are enclosed in microscopic cages composed of water molecules. Methane gas is primarily formed by microorganisms that live in the deep sediment layers and slowly convert organic substances to methane.

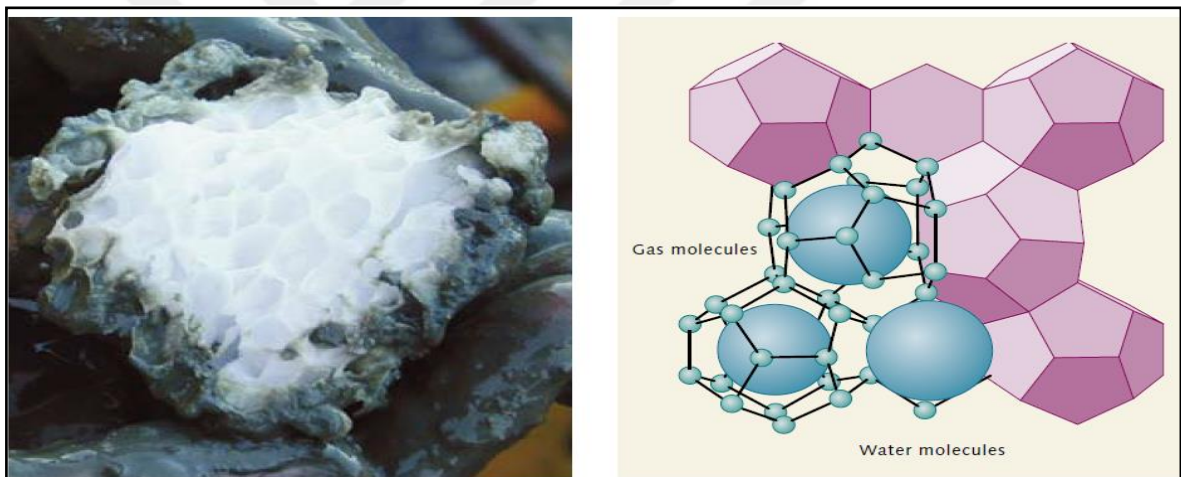


Figure 2.12. Form of Methane Hydrate [45]

As seen in Figure 2.12. methane hydrates is located in the coast lines so it is not needed to extract from deeper ocean floors. Many scientists estimate that mining the hydrates could be economically feasible at an oil price of about 50 to 60 US dollars per barrel. This implies that production would already be profitable today. Great efforts are presently being made to develop hydrate deposits, particularly in the territorial waters of Japan, China, India, South Korea and Taiwan [45].

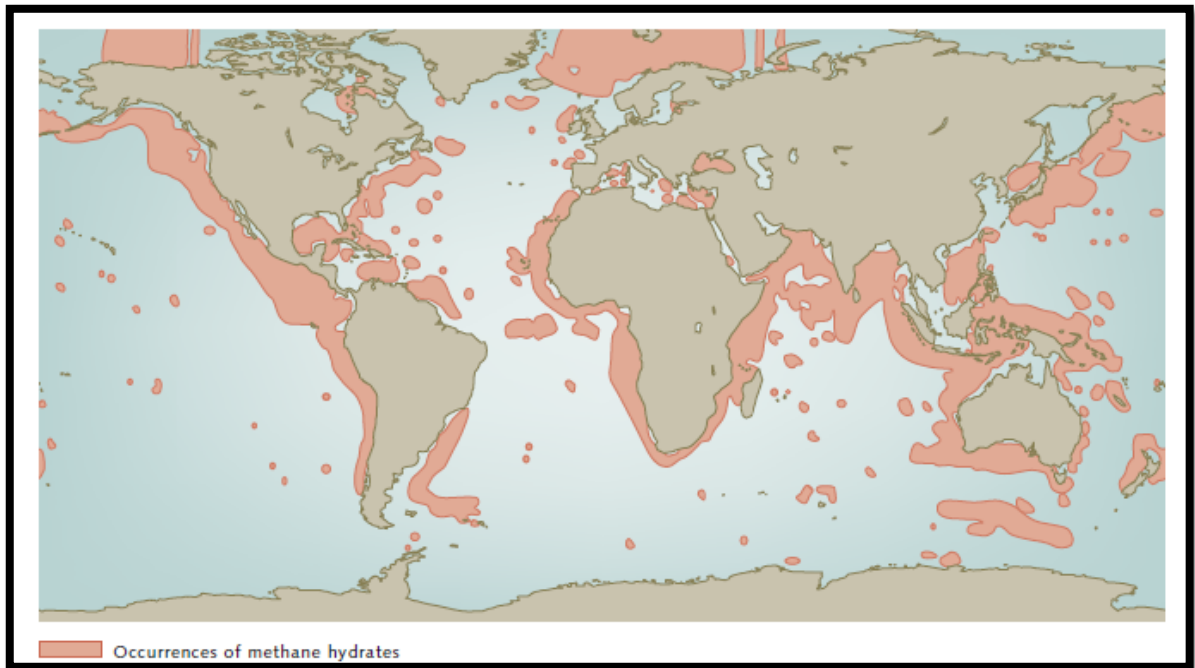


Figure 2.13. Occurrence of Methane Hydrate [45]

Marine mining is the other marine resources area. The turnover of marine minerals and aggregates in 2004 was 3,409 billion dollars. The main mining sources are manganese nodules, cobalt crusts and massive sulphides. The price fluctuation and the new discovery of onshore deposits of the mines designate the interest level. On the other hand, the countries which try to protect its own onshore deposits focus on sea mining.

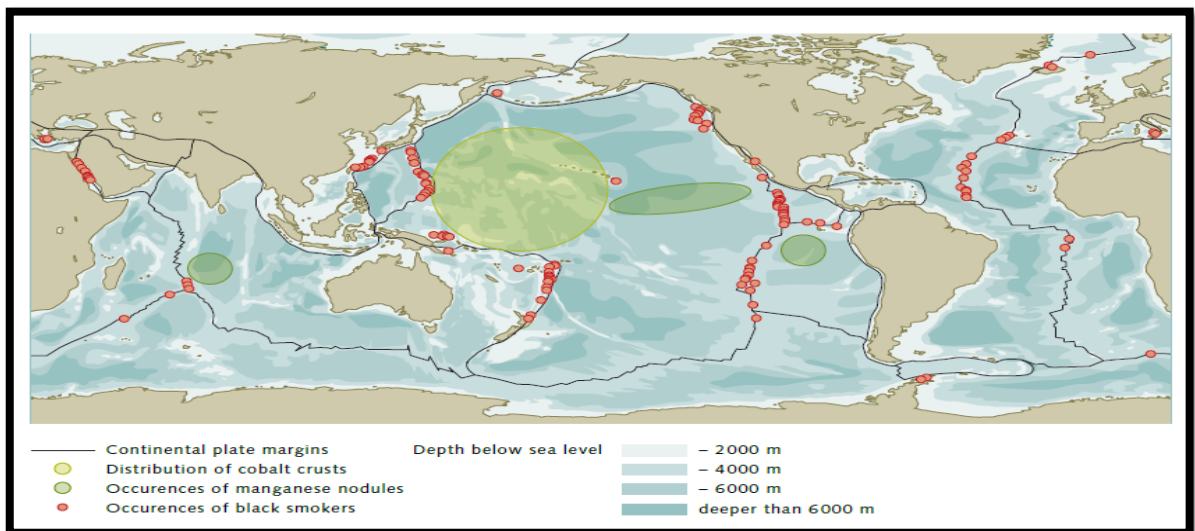


Figure 2.14. Distributions of Mines [45]

Renewable energy is the other new marine energy source consists of tidal energy, Wave energy, wind energy, ocean current energy, ocean thermal energy and osmotic energy.

Today the ratio of it is not in a perceivable level but it is believed that renewable energy will shape the future due to global warming. Especially EU and Asian countries pays attention to offshore wind technology. EU ambition is to install 40GW by 2020 and 150 GW by 2030. the offshore wind energy industry needs to attract between €90 bn and €123 bn by 2020 to meet its deployment targets, increasing its installed capacity from 6 GW in mid-2013 to 40 GW, with NREAP targets even higher at 43 GW by 2020 [47]. Renewable energy and the green shipping market will be the new way of oceans to protect environment and climate. Climate change will affect the transportation routes. Arctic is the most contemporary example and it is not hard to predict the effects. Moreover, renewable energy is an economic and durable energy. In this concept, the IMO's regulations from the point of environmental protection will shape the shipping market so that all Maritimization countries have to focus on renewable energy management and green shipping market.

Until the second half of the 20<sup>th</sup> century, oceans only provide fish to humankind. But today it resource scope expanded with deep sea mining, oil and gas industry and renewable energy systems. It seems that in the near future the benefits of oceans can enlarge according to technological developments.

Up to know the main activity areas of marine industry is summed but there are some other sectors that can be the new sectors of maritime industry such as Ocean Survey, Submarine Telecoms, Marine IT, Marine Biotechnology, R&D and Education and Training

### **2.1.6. Other Maritime Sectors**

Although Biotechnology seems like a new sector, it is indicated in EU Blue Growth report as one of the five main sectors of maritime industry. While estimated current employment in the sector in Europe is still relatively low, and a gross value added of €0.8 billion, the growth of the sector will offer high-skilled employment, especially if ground-breaking drugs can be developed from marine organisms, and significant downstream opportunities. In the very short term, the sector is expected to emerge as a niche market focused on high-value products for the health, cosmetic and industrial biomaterials sectors. By 2020, it could grow as a medium-sized market, expanding towards the production of metabolites and primary compounds (lipids, sugars, polymers, proteins) as inputs for the food, feed and chemical industries. In a third stage, around 15 years from now and subject to technological breakthroughs, the blue biotechnology sector could become a provider of mass market products, together with a range of high added value specialized products. [48]. As seen above all sectors of maritime are open for technological developments and improvement of technology is so important. That's why research and development is an issue that all maritime nations have to pay attention. The EU financial contribution to marine related-research and innovation has amounted to €1.4 billion through 644 projects over 2007-2010. Three joint calls of FP7, under the Ocean of Tomorrow label, have supported multidisciplinary marine and maritime projects for a total EU contribution of €134 million. This effort was complemented with the launch of coordinated topics in 2012 in order to support the implementation of the Marine Strategy Framework Directive, for a total EU contribution of €42 million [49]. I can't pass without adding Marine IT (Information Technologies) systems. As known software systems are the new way of technological movements and IT system especially use in navy helps to improve technology. And all these activity needs well- educated person. This can occur with the help of well-planned education systems.

As a result, marine biotechnology is a new and up and coming industry that can solve the main health problems of the mankind. In this sense, it is obvious that this sector will become more important and be a new revenue source. On the other hand, I think that maritime technology, R&D and IT technologies will share the same destiny and will be cover more rate in maritime economics

Up to this part the maritime economy and its activity areas are summed. As seen maritime system is an issue that mainly consist of vessels, ports and trade. All system is gathered around of these main items. By the help of the discoveries age, this system is consisted and developed every passing day. Namely, the human discovered the unknown areas and learned the importance of the sea. They established ports and made new warships to maintain the command of the sea. The new clash areas for power struggle were emerged. This power struggle at sea developed new maritime economic areas from shipyards to tourism, from navies to merchant shipping, from fisheries to marine resources and along with their industrial support. The states controlling these economic areas became maritime powers, thus maintaining its imperial power. After the discoveries age, the western nations being aware of the sea, trade and navy, they competed for the hegemony over the ocean. Thus, Portugal, Spain, Holland, UK, France, USA and Soviet Union have become maritime power periodically. They emphasized on educating seafarers. They tried to enhance their maritime awareness in order to be a maritime nation. Maritime trade and navies expanded their reach and capabilities as industrial revolution and accumulated capital have provided new technologies and ventures [4]. Today the navies' role is evolved but the need to them and sea power continues. The struggle to domain the oceans and sea will not end.

## 2.2. Sea Power



Figure 2.15. Puzzle of Sea Power

The history of humankind can be divided into three main phases. First phase which are the civilizations are bases on farming culture between B.C. 5000 and B.C. 500. The first ships were built but not used effectively in that period. The heartland of the world was in Mesopotamia and Middle East during this phase and the trade was done by land. The second phase is between B.C 500 and A.D. 1500. Macedonian, Roman, China, Mongols, Roman and Ottoman can be the most known examples that are the first civilizations come in mind before 15<sup>th</sup> century. Globalization process does not developed during that phase so that any state could not reach the global leadership. The ships are used and the first known sea war, salamis was occurred B.C 480 between Persian and the Greeks city states. But these were limited examples of the use of seas. And the third phase, after A.D. 15<sup>th</sup> century, began by the help of the globalization process. After this century, the hegemonic power wars were conducted at seas. In this concept, it can be said that the significant process about the global hegemony is begun after the discoveries age by the beginning of globalization and free flow of trade. EU states which realized geographic discoveries get the benefits of virgin raw materials managed the trade and protect trade routes by naval power. Namely, global reaching capability and the term global hegemony become more important in this phase. Hegemony (Greek), literally, supreme command or supremacy, in Greece in particular designating the diplomatic and military control which was granted to an individual state because of the authority, bravery and war experience of its citizens by a number of other states [50]. The term “hegemony” means “leadership or dominance, especially by one state or social group over others” [51]. The words such as command, power, supremacy, lordship, sovereignty, control, leadership and rule can also be the same meaning of hegemony. George Modelski chooses to use the terms global leaderships whereas hegemony in the study of Long cycles in Global Politics. Leadership or

hegemony? The most important part is the way which goes to get it. If the hegemonic powers of the world are examined, the most important common trait of them can be defined as naval power. All hegemonic or super power of the world established an ocean navy and used naval power. The naval power usage enlarged by expanding trade and the navies tried to provide hegemony. The states such as Portugal, Spain, Dutch Republic, France, Britain, Germany, Union of Soviet Socialist Republics and USA tried to get the global hegemony after 15<sup>th</sup> century and today the struggle continue. There are four main approaches to hegemony which is as an international relations term:

- The Conventional Approach
- The Nooliberal Approach
- The Gramscian Approach
- The Radical Approach

The hegemonic approaches are not detailed in this study but some differences emerge between the hegemony theories according to approaches. But it can be said that the factors that affect global hegemony are similar from the point of all approaches. The factors on which the superiority of the hegemon may lie include geography, natural resources, industrial, financial and in general economic capacity, military capacity and preparedness, population (including both quantitative and qualitative aspects such as education), morale and unity, quality of diplomacy and government, technological innovation etc [52]. Ikenberry and Kupchan sum up some of these factors by arguing that ‘the constitutive elements of hegemonic power include military capabilities; control over raw materials, markets, and capital; and competitive advantages in highly valued good’[53]. As seen above economic and military factors are the main ones that has huge effects. In this concept, sea power can be named the instrument of military factor, moreover maritime trade and ocean management can be other main parameter of economic factors. Hence, the terms maritime power, sea power, maritime hegemony and maritime supremacy are the notions that any state have to own which wants to be a crucial player of the global system and follow the hegemony road. George Modelski sums the historical hegemonic process in the Table 2.4.

The principal results of research aimed at showing such regularities, in three realms:

- those of global political economy,
- of sea power concentrations,



➤ and of acts and occasions of leadership in global affair of the past half-millennium [5]

The economic evolution and the factors affect the hegemony from the economic perspective is summed as gold trade, spice trade, industrial revolution, electric power, chemistry and telephone waves by Modelski. Namely, the technological development and volume of trade and transport of raw materials shaped the world. This system is protected by navies. Today, over 150 countries have naval fleet so that the role of sea power is supposed to be noticed. As seen in the table Portugal, Dutch Republic, Britain, and USA are the states that has hegemony periodically. All of these states have naval power and control the maritime trade in their period. As seen in Figure 2.4. Modelski separated a part to sea power while defining global leadership periods under the topic of “sea power threshold attained.” This table shows the relationship between sea power and global leadership.

Table-2.4. Evidence for Long Cycles Regularity

(1) First K-wave peak (obs.)*	(2) Global war	(3) Occasions for global leadership**	(4) By	(5) Sea-power threshold attained***	(6) 2 <sup>nd</sup> K-wave peak (obs.)*
1480s	Wars of Italy and the Indian Ocean	1494 Treaty of Tordesillas 1499 Design for Cape route	Portugal	1510	1500s/ 1530s
1560s 1670s	Dutch-Spanish wars Wars of Grand Alliance	1585 Anglo-Dutch alliance 1609 Truce of Antwerp 1689 Anglo-Dutch Alliance 1713-4 Peace of Utrecht	Dutch Republic Britain I	1610 1715	1620s 1710s
1780s	Revolutionary and Napoleonic wars	1793 Britain opposes aggression 1814-5 Vienna settlement	Britain II	1810	1830s
1870s/ 1900s	World Wars I and II	1917 14 Points 1941 Atlantic Charter 1943-5- Summits	USA	1945	1960s
2000s <sup>L</sup>					

\* Based on Modelski and Thompson 1996  
 \*\* Based on Modelski and Modelski 1988  
 \*\*\* Based on Modelski and Thompson 1988

This cycle can be defined with the words of Sir Walter Raleigh: “Hee that commands sea commands the trade, and hee that is lord of the trade of the world is lord of the wealth of the world.” Or with the Ottoman Admiral Barbaros Hayreddin Statement: “The state which commands sea, commands world”. This sight of view can be named as “the key of the world hegemony.”If the process is examined conceptually, the importance of the definitions about the marine notions is noticed. Peter Patfield mentions that maritime supremacy is the key which unlocks most, if not all, large questions of modern history,

certainly the puzzle of how and why we the Western democracies as we are [54]. That's why the relation between global hegemony and maritime hegemony is obvious. Besides, this definition shows the effect of maritime vision to the establishment of free thought and democracy. In this concept, Britain global hegemony named as British maritime power or British maritime hegemony. The oceans didn't lose its significance today for UK as well: In a world of rapid change, characterized by issues such as globalization, climate change, resource scarcity and population growth to name but a few, the crucial importance of the sea to the UK remains unchanged. We are a maritime trading nation whose national interests are truly international both in terms of our security and our prosperity [27]. In this concept the terms maritime power and its relation with maritime hegemony and the elements of it becomes significant. Maritime power is defined as: The ability to project power at sea and from the sea to influence the behavior of people or the course of events. [27]. This is a military approach and still there are some challenges and definition confusions about the terms of maritime power and sea power. 'Sea power means different things to different people. It can be an almost mystical concept...[or] a more coherent but equally universal concept, an interlocking system of forms of sea use'[55]. Tandredi, use states that concept in his paper as: "Globalization and Sea Power: Overview Context": "Therein lies an initial clue to the little-explored relationship between sea power—or in the unifying terminology of this volume, maritime power—and globalization [56]." He mentions that sea power and maritime power as a unifying terminology. This is an important example that unifies the terminology. Modern sea power can be defined as the combination of a nation state's capacity for international maritime commerce and utilization of oceanic resources, with its ability to project military power into the sea, for the purposes of sea and area control over commerce and conflict, and from the sea, in order to influence events on land by means of naval forces [56]. This definition can be named as well done definition for sea power that includes economic and naval approach. But another important part is that sea power does not have the same meaning with maritime power. There some more definitions as well. Briefly, the sea power, comprise navy or naval forces and coast guard and merchant fleet elements totally. Industrial infrastructure that supports all sectors is included in sea power [8]. Geoffrey Till, in 'Sea power: A guide for the Twenty First Century' treats sea power as both an input [57]– Navies, coastguards, the marine or civil industries, the contributions of land or air – and as output, defined in terms of consequences: the sea based capacity to determine events both at sea and on land [36].

For the purposes of this essay, the definition that sea power is ‘the ability to use the seas and oceans for military or commercial purposes and to preclude an enemy from the same’ [59] indicates the relationship between the civil and military maritime sectors [57]. In addition to definition, the elements of the sea power are also important during the establishment of sea power. Mahan identifies six characteristics as “principal conditions affecting the sea power of nations”: geographic position, physical conformation (including natural resources and climate), extent of territory, population, character of the people, and character of the government [9]. Modern naval historians have updated and reformulated the list, and a recent depiction includes economic strength, technological prowess, sociopolitical culture as “first order” conditions, and geographic position, dependence on maritime trade and sea resources, and government policy and perception as “second order” conditions [55]. The elements and the definitions can be revised according to developments in oceans and navies. As seen in the Table 2.5., the elements and the factors that affect the global hegemony and sea power overlap. Only the topic such as Military Capacity and Morale and unity does not match. These topics are the items of Superiority of the Hegemony and do not in sea power elements. In this sense, it can be claimed that hegemony is a more extensive topic than sea power so that it has more two elements. And this table shows the relation between the global and maritime hegemony easily. Hence, it is easily perceived that all global hegemonic powers of the history have ocean naval fleets and sea power. The elements of sea power complete global hegemonic elements and factors. Besides, sea power helps to build a global hegemonic power.

Table 2.5. The Comparison of Elements That Effect The Global Hegemony and Sea Power

<b>The Factors on which the Superiority of the Hegemony may lie Include according to Morgenthau, Ikenberry and Kupchan</b>	<b>Elements of Seapower according to Mahan, and Modern Naval Historians</b>
Geography	Geographic Position
Natural Resources	Physical Conformation (Including Natural Resources and Climate)
Industrial, financial and in general economic capacity	Economic strength, dependence on Maritime Trade and sea resources
<b>Military Capacity</b>	
Population (including both quantitative and qualitative aspects such as education	Extent of territory, population, character of the people
<b>Morale and Unity</b>	
Quality of diplomacy and government	Character of the government, sociapolitic culture
Technological Innovation	Technological Prowess

The definition and the elements of sea power are detailed above but the difference between the sea power and maritime power is not mentioned. Maritime power involves many other topics that differentiate from sea power. Maritime power is the total efficiency of intellectual, emotional, academic, physical, economic, military and political efforts that are made for the use, evaluation, protection, evolving of a nation's capabilities and resource regarding the sea and marine for the benefit of a nation [59]. The notions intellectual, emotional, academic, physical are also involved in maritime power. In other words, maritime power is a complex power system that carries a variety of material and spiritual power and strength and transfers their overall efficiency to the national power [60]. Maritime power consists of the area which includes every type of material and spiritual power belonging to sea and maritime. Namely, all live or non-living components which are directly or indirectly related with sea can be within maritime power [8]. As seen in the definitions maritime power is the element of national power and consist the main body of global hegemony. The effect of percentage of maritime power in national power varies according to the capability of the nation or the state. Besides, the countries that do not have an ambition to get the maritime hegemony are supposed to follow maritime power way for their national security, prosperity and free thought improvement. The steering of a nation to maritime power is usually based on two principles. This process can begin with the leadership of the state or community. The geographic conditions oblige the nation to reach and benefit from the sea such as Japan or Britain. Or the government of the state gives a decision and applies a marine policy to gain seas economic and political benefits and steer the community to the sea. In my opinion, Maritime Fleet Power is the other subtopic as an element of sea power includes vessels, ports, supply services and educated seafarers. The effects and importance of maritime transportation is detailed in vessel operations part. Maritime fleet power is important from the point of controlling the way of trade and its companies. Namely, it means the money or the economic power. The 4<sup>th</sup> of 5 countries which has the highest GNI (2012) –China, Japan, Germany and France has big maritime transportation companies. China has 4 (COSCO, Evergreen Line, CSCL and Yang Ming), Japan has 3(MOL, NYK and K line), Germany has 2 (Hapag-Loyd Group and Hamburg Sud), and France has 1 (CMA CMG Group) maritime transportation operator firm. This trend indicates the power of maritime transportation. The other important element is naval power. The state which dominates the world has a common point that they have an ocean navy. Naval fleet, support services, Headquarters, Coastguard and educated personnel can

be the important point that consists of navy and its hard power. On the other hand there is another important subtopic as diplomatic power or soft power. Navies can be used to project power or to show the power of the state. In this concept, the navies can be named as an instrument of national policy and security before and on war.

As a result, in order to be a strong country, the states need maritime power. The conceptual approaches are detailed in this part. But there are more other topics that complete the maritime power such as Maritime Vision, Maritime Culture and Maritime Education.



### 2.3. Maritime Vision



Figure 2.16. Puzzle of Maritime Vision

As defined in the above pages, sea power covers maritime fleet, naval power management and maritime industrial supported areas. But, in order to establish a maritime power, it is needed some notions that motivate the community and push them to think in a blue way.

First of all, the government vision is so important. History is full of evidences that the states policy steer nations to maritime power. Quinn I. Elizabeth for United Kingdom, Henry the Navigator for Portugal, Theodore Roosevelt and Mahan for USA, Czar Petro for Russia, II.Wilhelm for Germany and Suleiman the Magnificent and Admiral Barbarossa can be named the governors, emperors and strategists of their era that has a maritime vision. They steer their state to blue waters and get the benefit of result. In this concept, maritime origin politicians are so important while the foreign policy and economic decisions are shaped. In this concept, an example about Admiral Barbarossa and Suleiman the Magnificent can be explanatory. About 1500's Admiral Barbarossa built a magnificent navy in the Mediterranean and applied naval policy. But after he died navy lost its significance and naval power couldn't survive. If Suleiman The Magnificent and the viziers had a maritime vision, Ottoman Empire's and the world's fate could change. But at that point, the importance of spiritual power exists.

Spiritual power can be defined as the thoughts of the nations that try to develop its maritime interest. In this concept, qualified and maritime origin manpower is so important. Spiritual power steer community to think and produce marine related innovative and strategic ideas. Three main subtopics are mentioned under it: Maritimization Focused Intellectuality, Awareness of International Constitutionalism, and Innovative and Technological Sight of Views. Maritimization Focused Intellectuality consist the main frame of spiritual power. The qualified man power which is in relation with sea and has a

maritime vision can change most of the things and maintain the course of the community. These subtopics are especially needed when the government does not have a mentality and policy in a blue way which can benefit from the seas economic and political advantages. Spiritual power can be defined as main element because all other notions bases on an idea and these ideas roots are stem from spiritual power. On the other hand, maritime industry and its application areas bases on international frames and laws so that all policies and strategies is supposed to be suit with international regulations. Hence the awareness of international constitutionalism is so important. All states which are in a blue way are supposed to raise maritime lawyers and politicians. The last subtopic is innovative and technological approach. Most of the naval and maritime system's development leads in the innovative and technological development industry. Especially naval combat and other systems are more complex and needs a software background. This positive technological acceleration affects the national defense and other main industries so that innovative and technological approach is the other essential subtopic.

Consequently, maritime vision is needed to educate qualified man power which will motivate the community and push them to think in a blue way and try to develop the nation's maritime interest. The role of spiritual power exists at that point. Spiritual power steer nations to think and produce marine related innovative and strategic ideas with the frame of international constitutionalism.

## 2.4. Maritime Culture



Figure 2.17. Puzzle of Maritime Culture

Maritime culture can be defined as the other element of maritime power. Culture means the ideas, customs, and social behavior of a particular people or society [61]. In this concept to provide the permanence of maritime culture and its transition to generation to generation, the perception of definitions is important. Therefore, it is needed to define maritime culture.

Maritime culture as a component of water culture can be understood as the group or set of features and of material and immaterial cultural expressions such as traditions, beliefs, practices, discourses and customs that are constructed as a result of the continuous, flexible and changing relationship between society and sea/land. Maritime culture is also defined starting from the diverse appropriations and perceptions of the different social groups regarding the sea, which allow to speak of a maritime culture, constituted in turn by several 'maritime cultures' that are constructed depending on the relationship level with the sea as social space and cultural landscape [62]. The maritime culture is then related to practices, among others, such as fishing and the construction of vessels; with beliefs about good and bad luck when navigating; with knowledge that facilitates forecasting the climate and phenomena such as storms; and with perceptions about the sea as a tourism space [63].

There are 5 subtopics that are defined under maritime culture such as children focused vision, associations, wind culture, sea sports and emotional power. The definitions about culture and maritime culture are detailed above. The important point is to create a generation which can perceive the importance of oceans and sea and also in relation with maritime related areas.

In this concept, children consists the core of the maritime culture element. Raising a generation that is in interaction with maritime is the main issue to built a maritime nation



and provide the sustainability of the maritime culture. The age between 6-10, can be the main goal. Education system and the power of media can be used to take the attainment of children to sea. Besides, Non Governmental Organizations (NGO) are the other main subtopic that can orientate the community to the sea related areas. NGOs are important from the point of gathering maritime professionals.

There are lots of factors that affect the maritime culture such as coasts, island, tourism, government approach, media and etc. But to establish a maritime nation and transfer this culture generation to generation, sea sports are good elements to use. Most of children like to swim and play with waters. This notion can be named as water culture [64]. Besides, sailing is different from swimming. Hence, it can be renamed as wind culture. And all children like to sail as well. Hence, they can upgrade themselves from water culture to wind culture. Other important element of maritime power is named as emotional power. Emotional power can be defined as a power that affects people thoughts and feelings to steer them to sea and its related areas. Loving blue waters is important to establish a Maritimization notion. Hence, maritime literature, poets and cinema can be used as an advertisement.

Finally, maritime culture is needed to provide the maintenance and transfer of maritime culture generation to generation. Establishing a culture is a process so that the elements such as Children Focused Vision, Associations, Wind Culture, Sea Sports and Emotional power are important to sustain maritime culture.

## 2.5. Maritime Education

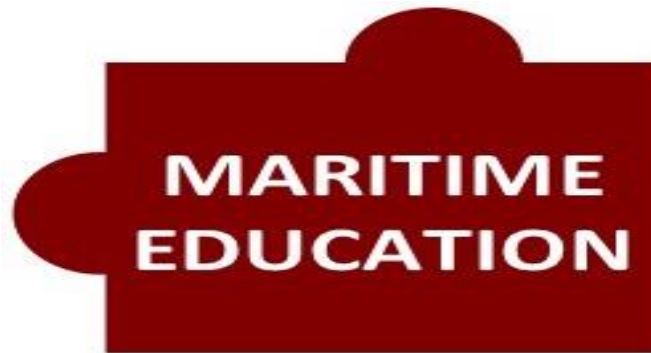


Figure 2.18. Puzzle of Maritime Education

Maritime Education is needed for Maritimization process's sustainability. It can be named as a backbone of maritime culture and business life. Without a comprehensive and well-design maritime education, the maritime cultural and long term sustainability of maritime industry cannot survive. Maritime sector has a huge activity area such as offshore and alternative energy resources, economy, coastal development, biodiversity, climate and weather change, transportation, port management, R&D, technologic development, maritime law, maritime policy. In order to manage this system and raise highly qualified specialist maritime personnel, all states need qualified maritime education centers and universities. This education system should be modern, open to change and satisfy the needs of maritime industry. In this concept, international accreditation and certification that is compliant with international regulations is also "sine qua non". Therefore, it is exactly accepted that the maritime industry needs institutionalized, standardized, internationally accepted, controllable and assessable maritime education system [38]. The role of field experience and coordination with business cooperation is also needed. Therefore, the on-job trainings ratio should be increased. Another trend is green industry. All states which follow a maritime way should raise professional and make investments on green shipping industry that includes energy sector. So, education centers should be in a close relation with maritime market and see the future trends. In this concept, R&D can name as the touchstone of the maritime education. All universities should contribute R&D trends and be in a close relation with market. Moreover, a comprehensive education is important from the point of safety and security of the oceans. History is full of evidences that the accidents harm the blue environment. In order to prevention of accidents that result in irrevocable damages, maritime education is a necessity.

## 2.6. The Outcomes of 3-Layer Holistic Maritimization Process

History is full of evidences that the countries which obtain maritime power could shape the world and reach the *wealth, security and innovational and libertarian thinking ability*. The historical examples of those outcomes are mentioned in Chapter I. In this chapter, those three outcomes are discussed and identified as the three outputs of 3-Layer Maritimization Model.

Today, maritime sector is a huge economy that consists of many sea related areas and it has a high contribution to economies. Most of the states profits from the maritime economical areas. In 2007, the French marine economy displayed the following features: A value added of nearly 28 billion Euros a labour force of nearly 485,000 jobs [65]. Germany, with gross value added of around 85 billion Euros and a workforce of around 400,000, the maritime industry is of great regional importance and of great importance to the economy as whole [66].

The influence of the whole Finnish maritime cluster is strong on the Finnish economy. The combined annual turnover exceeds 10 billion Euros and the whole cluster employs some 40.000 people in Finland [67].

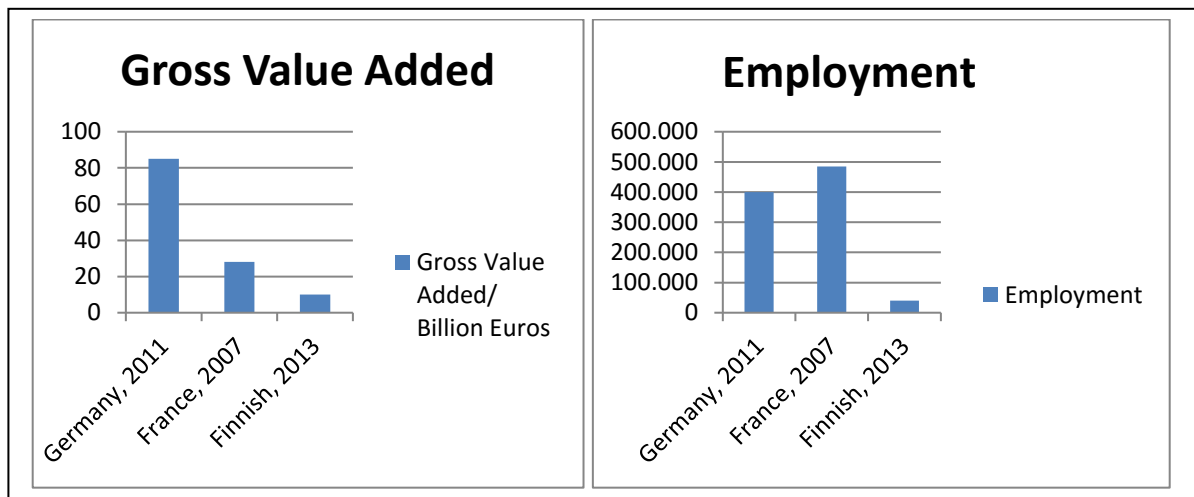


Figure 2.19. Summary of Maritime Economic Activities

Evidence to support this is found in the Maritime Clusters report commissioned by Commission of European Communities (2008), which states that maritime industries are vital to Europe, responsible for between 3-5% of European GDP. This diverse industry provides employment to over 3 million people in coastal communities, generating 40% of total European GDP. [68]

Haralambides [69] gives more information as: “in the United States, for example, it has been recently calculated that for every job in the merchant marine, 4.4 additional jobs were created in the economy, and for every dollar of household income in this sector, 3.4 dollars of additional income is created in the economy by and large. Similar results have also been demonstrated in Holland, United Kingdom, Italy, and Belgium [69]. And in the European Union (EU) maritime regions account for about 40% of its Gross Domestic Product [70].”

The maritime services sector (ports, shipping and maritime business services (ship broking, insurance and related financial and legal services and the activities of classification societies, including Lloyds Register)) made an estimated £13.8 billion direct value-added contribution to GDP in 2011, equivalent to 0.9% of the UK economy in 2011[71]. The Figure 2.20. gives the summary of maritime service sector economic contribution to the UK economy. The total contribution of maritime services is about 32 billion pound with the 634,900 employments and 8.5 billion tax revenue. Not only the direct effect but also the indirect and induced effect is also important.

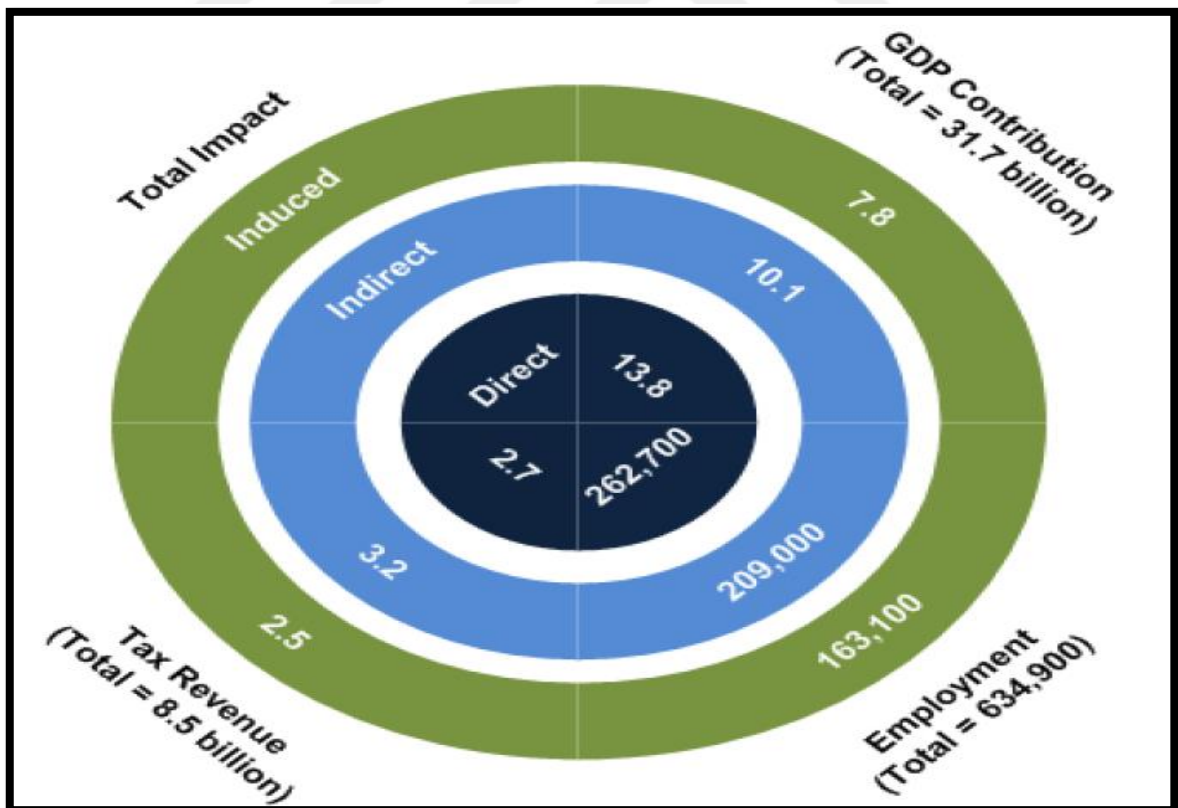


Figure 2.20. Summary of the Economic Contribution of the UK Maritime Services Sector in 2011 [71]

Although there are more maritime economic activity areas, in Figure 2.21., only the maritime service part is examined and the contribution of maritime economy can be detected easily.

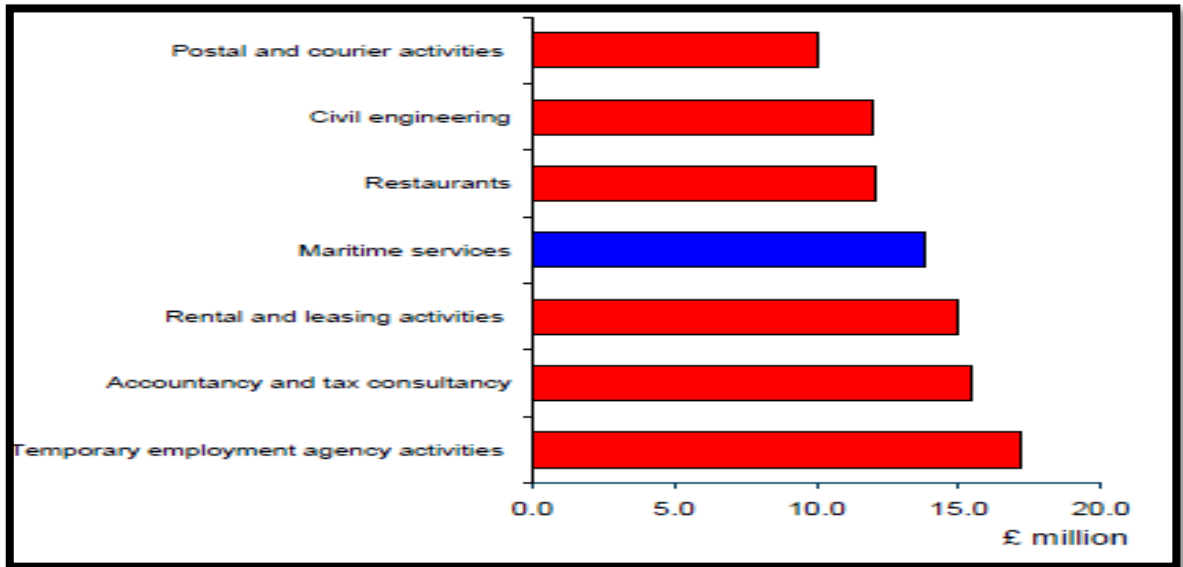


Figure 2.21. Comparison of GDP Contribution to Other Industries in UK in 2011 [71]

Figure 2.22. is the other example from the pacific side of the world. The additional benefit of maritime sector is also calculated for Chinese economy and its annual growth rate is about 10%. Besides, China's marine-based economy exceeded 5 trillion yuan (\$820 billion) last year (2012), accounting for 9.6 percent of the national economy, according to the China's Ocean Development Report [72].

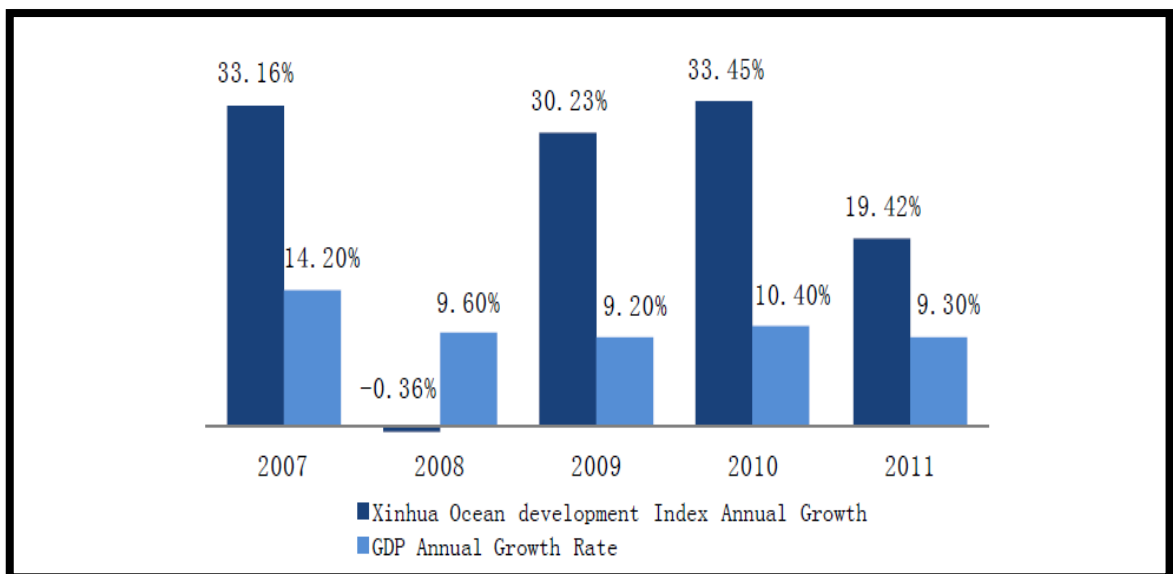


Figure 2.22. Comparison between Xinhua Ocean Development Index Annual Growth Rate and GDP Annual Growth Rate, China 2007-2011 [73]

Some parts of economic benefit and the contribution of maritime economy to GDP are summed above with the some countries' examples. But the benefits of sea are not limited with economic indicators. *Wealth* is not only output of maritimization process. Open mind approach and interactivity with world can be deemed as the second benefit. In other words, it can be named as *innovational and libertarian thinking ability*.

It is easily said that sea trade improves the interaction between civilizations and continents. In fact, transportation has been called one of the four cornerstones of globalization, along with communications, international standardization, and trade liberalization [74].

Maritime transportation, an enabler of globalization demonstrates that transportation (in general) and shipping (in particular) have been and remain key ingredients in fostering globalization. In fact, the maritime industry has transformed its technologies, national registries, and labor resources over the past decades to serve the demands of globalization [75]. Namely, Figure 2.23. is the snapshot of globalization.

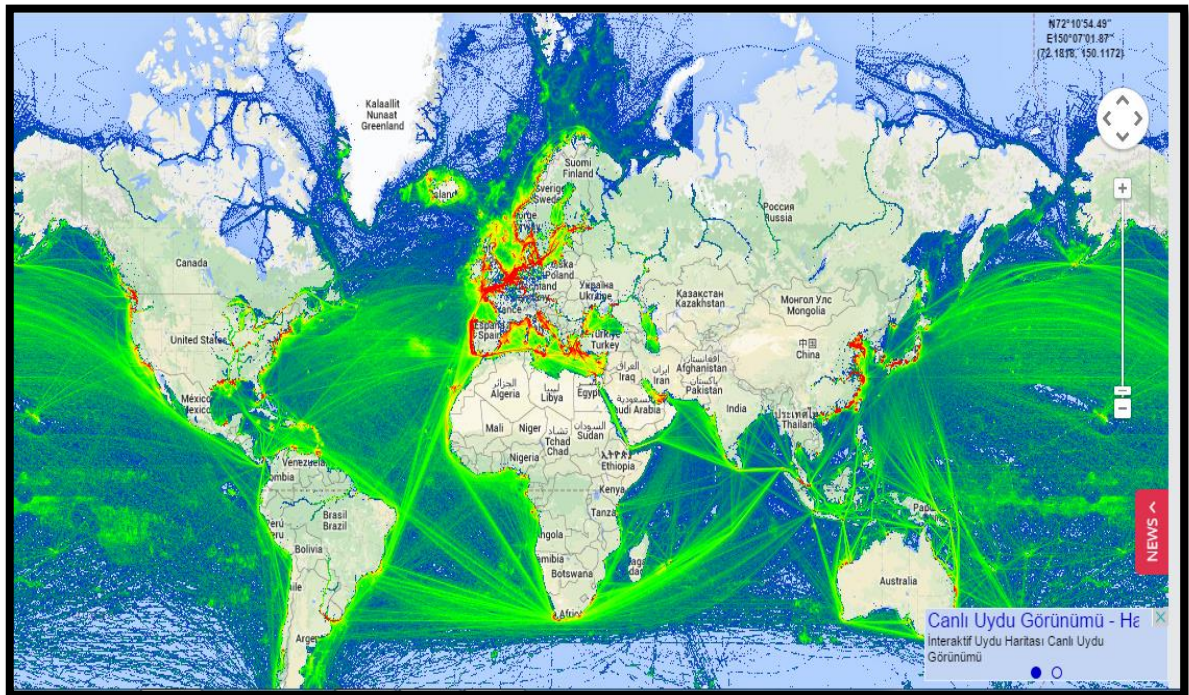


Figure 2.23. Marine Traffic View, 29.10.2014 18.17 [76]

The effect of maritime and naval activities cannot be underrated upon globalization during this process. It is an exact view that the globalization increased the interaction between cultures and free thought. But, the seas has a huge contribution to the development of them. The dispersion of religions especially Christianity in Africa can be the good example

of mutual cultural interaction. And the inventions are the example of open mind and freedom of thought notion.

After 15<sup>th</sup> century, many inventions have been created by western scientists. This cannot be explained with coincidence. The effect of interaction and the fighting spirit of the sea and steering people into the mystery unknown is an undeniable effect. Technological developments and the innovations are the other results mainly done by western countries. This process can be characterized as one of the sources of free thought that is developed in the West. This trend still continues as seen in the Global Competiveness report 2013-2014: 8 European countries exist in the first of 10 countries, of list “Capacity for Innovation” (Switzerland, Finland, Germany, Israel, United States, Japan, Sweden, United Kingdom, Netherlands, and Belgium) in the Global Competiveness Report 2013-2014.

Besides, another 8 European countries exist in the first 10 of countries, of list “Quality of Scientific Research Institutions” (Israel, Switzerland, United Kingdom, Belgium, United States, Germany, Netherlands, Australia, Japan, and Finland).

Another example is from the “PCT patent Applications” list. 7 European countries exist in the first of 10 countries (Sweden, Switzerland, Finland, Japan, Israel, Germany, Denmark, Netherlands, Korea Rep, and Austria) as well. Namely, the western nations which are in relation with sea still dominate the innovative ideas world.

Other main effect can be named as the *security*. Humankind first built navies to secure their coast and fishing activities. Then, by the development of trade, the navies are tasked for protecting the freedom of seas. Today, there are many functions that navies carried out such as war on Terrorism, Military diplomacy, sanctions enforcement, provision of humanitarian assistance, building maritime domain awareness, crises management, and sea denial. But still, freedom of seas can be named as the most important for humankind. In this respect, it is not trade that has to be protected; it is the overall system in which trade takes place that has to be protected [77].

British Maritime Doctrine sums these views as: Our strategy reflects the country that we want to be: A prosperous, secure, modern and outward-looking nation, confident in its values and ideas. Our national interest comprises our security, prosperity and freedom. We must be a nation that is able to bring together all the instruments of national power to build a secure and resilient UK and to help shape a stable world [27].

In this concept, in this study an approach is suggested that the naval, economic and innovative greatness develop in a parallel way and have a strong relation with maritimization process and in between them. Namely, today maritimization processes provide three main benefits to the states as;

- Wealth of Nations
- Security of Country
- Innovational and Libertarian Thinking Ability.

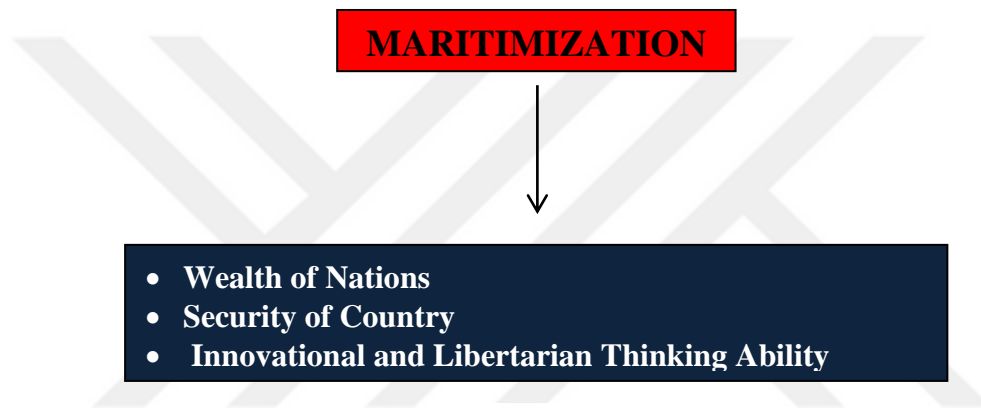


Figure 2.24. Results of Maritimization

The verification of these three outputs of 3-Layer Holistic Maritimization Model is carried out in the next chapter.

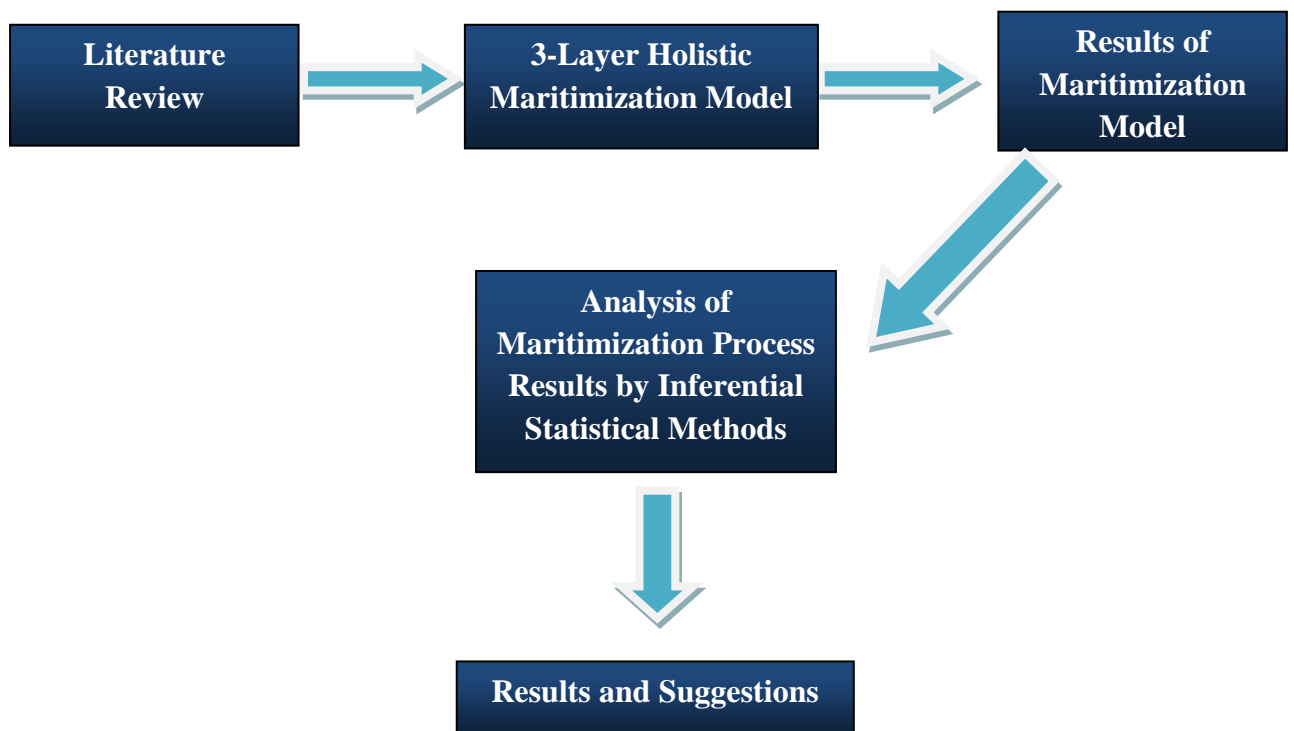


### 3. METHODOLOGY

In the second part of this study, an approach to maritimization process is developed and a model is suggested in the way of maritimization. This model claims that the maritimization process has 3 main outputs such as Wealth, Security and Innovational and Libertarian Thinking Ability.

Security is the exact result of this suggestion because all navies all around the world are mainly built for the security of the nations. But the claim about the Wealth of Nations and Innovational and Libertarian Thinking Ability needs a scientific support. In this sense, the inferential statistical methods are used to analyze the relation.

Firstly, the two main results of maritimization process “Wealth and Innovational and Libertarian Thinking Ability relation with Maritime Power is analyzed by inferential statistical methods such as correlation and regression tests with SPSS 20.0 program. The relation between Liner Shipping Connectivity Index (LSCI) and Gross National Income (GNI) is analyzed from the sight of Wealth-Maritime Power relation. After that, the relation of Capacity for Innovation (CI) and LSCI is analyzed from the sight of Innovational and Libertarian Thinking Abilities - Maritime Power relation.



### 3.1 Inferential Statistical Methods by SPSS Program

The purpose of the inferential statistics is to try to reach conclusions that extend beyond the immediate data alone. For instance, inferential statistics are used to try to infer from the sample data what the population might think. Or, inferential statistics are used to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study [78]. Correlation and regression tests are the suitable way to see the relation between data and to give a decision. In this concept, Inferential Statistical Methods are used for showing the relation between data.

#### 3.1.1. Correlation Tests

In statistics, the Pearson product-moment correlation coefficient (sometimes referred to as the PPMCC or PCC, or Pearson's  $r$ ) is a measure of the linear correlation (dependence) between two variables  $X$  and  $Y$ , giving a value between  $+1$  and  $-1$  inclusive. It is widely used in the sciences as a measure of the strength of linear dependence between two variables. It was developed by Karl Pearson from a related idea introduced by Francis Galton in the 1880s [79]. Pearson's correlation coefficient when applied to a population is commonly represented by the Greek letter  $\rho$  (rho) and may be referred to as the population correlation coefficient or the population Pearson correlation coefficient. The formula for  $\rho$  is:

$$\rho_{XY} = \frac{cov(X, Y)}{\sigma_X \sigma_Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y} \quad (2.1)$$

and Spearman correlation coefficient  $\rho$  is given by:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \quad (2.2)$$

#### 3.1.2 Regression Tests

In statistics, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables. More specifically, regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent

variables is varied, while the other independent variables are held fixed [79]. In simple linear regression for modeling data points there is one independent variable:  $X_i$ , and two parameters,  $\beta_0$  and  $\beta_1$

$$\text{straight line: } Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i, \quad i = 1, \dots, n. \quad (2.3)$$

The summary information about correlation and regression analysis is given in this section. The verification tests about the outputs of the maritimization model are carried out in the next section.



### **3.2. Wealth and Maritime Power Relationship Evaluation in the Concept of: The Relation between Liner Shipping Connectivity Index (LSCI) and Gross National Income (GNI)**

The effect of maritimization process on states and nations is summed under three main topics. One of the main results of the maritimization process is wealth of nations. There are certainly more parameters that effect the wealth of nations. Trade and growth of national income can be a determiner in this concept. There are many papers and theories which discuss the relation of trade and economic growth. These include the relation of transportation/export/import and GDP/GNI. Many different views are mentioned about their relation and the effects on economy. But, this study focuses on more specifically on trade through maritime transportation and growth. This statically research is carried out to indicate the relation between wealth and maritime power.

The Liner Shipping Connectivity Index consist five main topics and these topics show the connectivity of the state to the international trade and maritime systems. In this context, it is believed that this research is important from the point of showing the maritime power effect.

There are many positive views that support this idea. Economic theory and empirical evidence lend support to the view that openness to trade advances economic growth and hence reduces poverty [80]. Kim and Lin found that trade openness contributes to long-run growth but the effect varies with the level of economic development [81]. In popular press as well as in policy discussions, measures of transportation in relation to GDP are often cited to illustrate the importance or contribution of transportation to the economy [82]. Openness to trade is one of several important factors to achieve economic growth.

Countries that are open to trade have had faster economic growth than countries that have been more closed to trade. Greater openness to trade is clearly associated with faster economic growth, but it is not the only factor contributing to growth. Other factors such as technical innovation, a responsible economic policy and education are also necessary [83].

The export/import and economic growth, on the other figure world trade, maritime trade GDP relations are mentioned below. As seen in the graphs their increase is parallel.

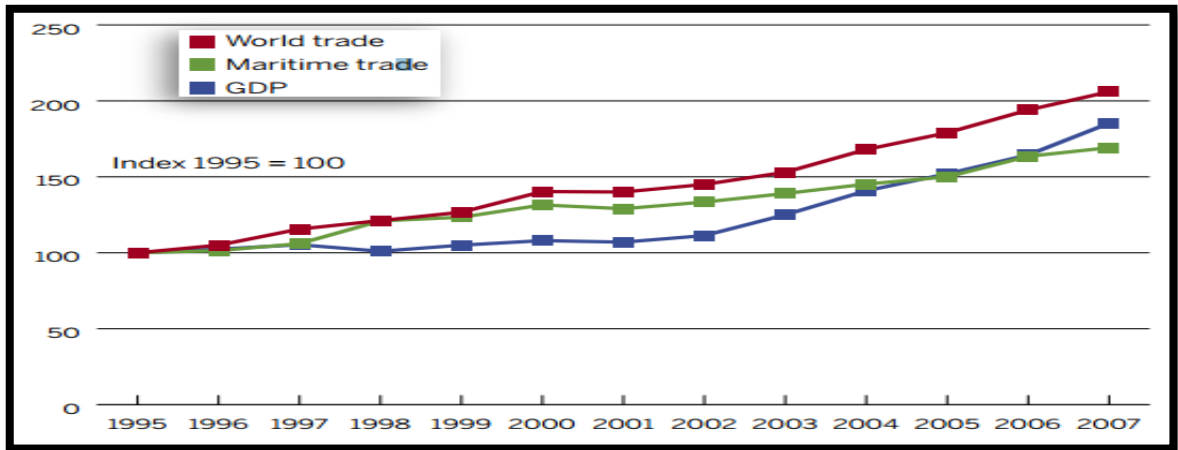


Figure 3.1 Relationships of Total World Trade, Maritime Trade and GDP [84]

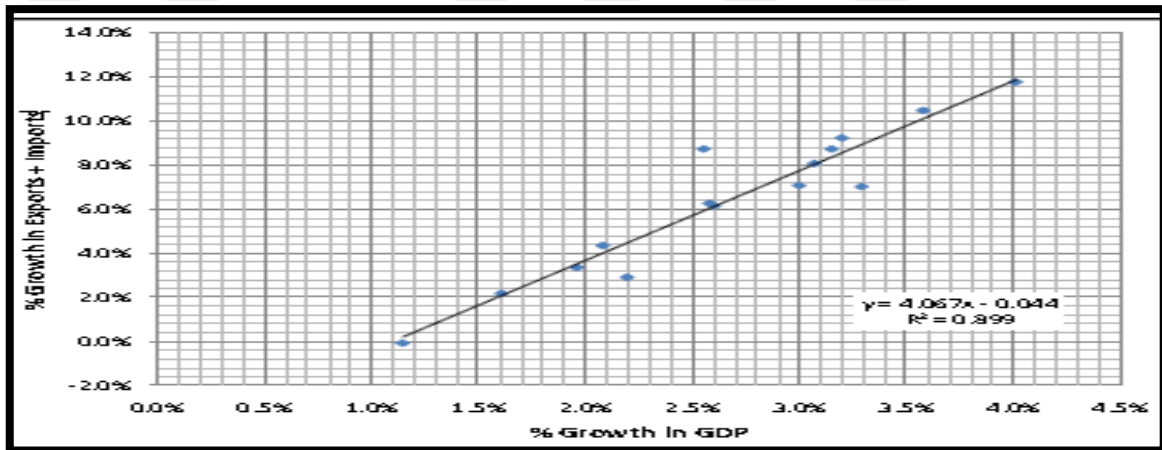


Figure 3.2 Relationships between OECD Economic Growth in Exports and Imports, 1992-2006 [84]

Namely, trade’s effect on economy is obvious. Besides this volume of global trade’s 90% is carried by maritime transportation. So, trade and maritime transportation are the intertwined. On the other hand, this part does not search the relation of maritime transportation and economic growth. It analyzes the relation of the “LSCI” and “GNI (Atlas Method)”. The LSC Index captures how well countries are connected to global shipping networks. It is computed by the United Nations Conference on Trade and Development (UNCTAD) based on five components of the maritime transport sector: number of ships, their container-carrying capacity, maximum vessel size, number of services, and number of companies that deploy container ships in a country's ports. For each component a country's value is divided by the maximum value of each component in 2004, the five components are averaged for each country, and the average is divided by the maximum average for 2004 and multiplied by 100. The index generates a value of 100 for the country with the highest average index in 2004. The underlying data come from

Containerization International Online [85]. These topics are the main body of maritime transportation but not the volume of transportation. These terms define the quality and level of development of transportation sector and it can be asserted as the main part of reflection of maritime power. In this context, the relation of them tested by the help of inferential statistical methods. SPSS 20.0 is used for correlation and regression tests.

### 3.2.1. Correlation Tests

In this research two variables are used. GNI named as a dependent variable and LSCI named as independent variable. 40 countries are selected for correlation and regression analyzes. The countries are listed according to their GNI level from top to bottom. Besides, their LSCI is mentioned in the second column.

Table-3.1. GNI and Liner Shipping Connectivity Index of Countries [86], [87]

Nu.	Country	GNI(2012)	Liner Shipping Connectivity Index (2012)
1	United States	15.734.567.204.659,60	91,70
2	China	7.748.902.758.565,36	156,19
3	Japan	6.105.797.918.740,86	63,09
4	Germany	3.603.894.791.740,22	90,63
5	France	2.742.891.447.825,63	70,09
6	United Kingdom	2.418.464.012.261,05	84,00
7	Brazil	2.311.146.876.311,11	38,53
8	Italy	2.061.253.457.983,07	66,33
9	India	1.890.362.772.482,67	41,29
10	Russia Federation	1.822.654.204.988,74	37,01
11	Canada	1.777.860.177.070,04	38,29
12	Spain	1.391.429.644.524,18	74,44
13	Australia	1.351.246.325.227,65	28,81
14	Mexico	1.176.868.534.949,18	38,81
15	Korea Rep.	1.133.791.208.237,61	101,73
16	Indonesia	843.992.800.814,35	26,28
17	Netherlands	809.071.961.553,30	88,93
18	Turkey	801.096.838.692,43	53,15
19	Switzerland	661.590.819.797,02	No Available Data
20	Sweden	534.959.157.025,42	49,45
21	Belgium	501.305.368.662,45	75,85
22	Norway	496.173.452.438,10	5,31
23	Poland	488.335.562.780,97	44,62
24	Austria	407.584.948.123,62	No Available Data
25	South Africa	389.765.169.401,24	36,83
26	Venezuela, RB	373.480.611.272,66	18,93
27	Thailand	347.936.312.871,34	37,66
28	Denmark	334.135.191.079,28	44,71
29	Colombia	333.613.914.690,51	37,25

30	Malaysia	286.426.103.573,88	99,69
31	Greece	262.431.282.850,31	45,50
32	Hong Kong SAR, China	261.598.877.180,45	117,18
33	Finland	254.147.685.401,42	15,51
34	Singapore	250.779.403.662,59	113,16
35	Chile	249.454.794.095,39	32,98
36	Egypt, Arap. Rep.	241.819.276.672,52	57,39
37	Nigeria	241.062.557.736,27	21,81
38	Philippines	238.712.656.685,90	17,15
39	Pakistan	225.431.871.832,10	28,12
40	Portugal	216.616.582.202,54	46,23
41	Iraq	191.180.504.552,84	7,10
42	Czech Republic	190.597.383.250,00	No Available Data
43	Romania	179.560.613.308,52	23,28
44	Ireland	178.837.545.029,73	12,99

When the Table 3.1. is examined, three countries are detected easily. Czech Republic, Austria and Switzerland are the countries that have no LSCI that's why they are not involved the test.

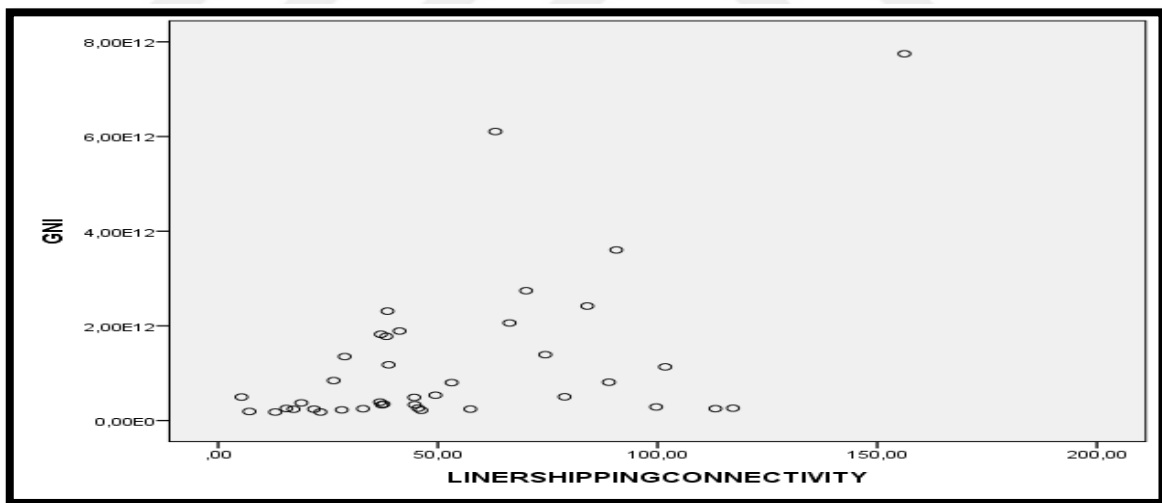


Figure 3.3 GNI and Liner Shipping Connectivity Index Graph

After this determination, it is easily mentioned that the countries which has more GNI -the first 40 countries- are the countries that are related with seas. Only three of them have no LSCI. To see parallelism between two variables scatter plot is drawn by SPSS 20.0 and the graph is shown in Figure 3.3. And also USA doesn't include to the test because of the high GNI level. The USA's GNI level is out of average GNI level. After detecting the positive correlation in Figure 3.3, the Pearson and Spearman correlation tests are carried out to see the strength of relation. The results are as seen as below.

### 3.2.1.1 Pearson Correlation

Pearson Correlation test results which are given by SPSS program are detailed as follow.

Table 3.2 Pearson Correlation Table

		GNI	LINERSHIPPINGCONNECTIVITY
GNI	Pearson Correlation	1	,502**
	Sig. (2-tailed)		,001
	N	40	40
LINERSHIPPINGCONNECTIVITY	Pearson Correlation	,502**	1
	Sig. (2-tailed)	,001	
	N	40	40

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

### 3.2.1.2 Spearman Correlation

Spearman Correlation test results are which are given by SPSS program detailed as follow.

Table 3.3. Spearman Correlation Table

		GNI	LINERSHIPPINGCONNECTIVITY
Spearman's rho	Correlation Coefficient	1,000	,458**
	Sig. (2-tailed)	.	,003
	N	40	40
LINERSHIPPINGCONNECTIVITY	Correlation Coefficient	,458**	1,000
	Sig. (2-tailed)	,003	.
	N	40	40

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

For both two tests, their correlation is significant at the 0.01 level. This means GNI and LSCI has a relation and effect to each other. But, the important point is the strength of this relation.



Correlation coefficient is 0.502 in Pearson Correlation test and 0.458 in Spearman Correlation test. So, there is a significant relation but not so strong since the relation of two variables includes many other variables. GNI has wide range and assisted by more sectors from agriculture, industry to construction and etc. On the other hand, Liner Shipping Connectivity Index does not include all maritime power topics. Firstly, there are many other maritime economic areas.

Moreover, maritime power is a notion includes not only maritime economical areas, but also sea power, maritime culture, maritime vision and maritime education. That's why the relation's strength is in expected level.

### 3.2.2. Regression Test

In this search, GNI is defined as dependent variable and LSCI is defined as independent variable. Then, the test regression test is run by SPSS 20.0. The R Square which shows the explained variation is shown as below.

Table 3.4. Model Summary (R Square<sup>b</sup>)

Model	R	R Square <sup>b</sup>	Adjusted R Square	Std. Error of the Estimate
1	,721 <sup>a</sup>	,520	,508	13,53

a. Predictors: LINERSHIPPINGCONNECTIVITY

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

Table 3.5. ANOVA a, b and Significance Table

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	802162244384104000 00000000,000	1	802162244384104 00000000000,000	42,278	,000 <sup>c</sup>
1 Residual	739968306312104900 00000000,000	39	189735463156949 9800000000,000		
Total	154213055069620880 00000000,000 <sup>d</sup>	40			

a. Dependent Variable: GNI

b. Linear Regression through the Origin

c. Predictors: LINERSHIPPINGCONNECTIVITY

d. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

R square is 0,520 according to regression test. This means R Square can explain the 52% part of the model. So, 48% part is unexplained by this regression model.

As mentioned above in correlation part GNI is a notion consists of lots of inputs. So, although there is a relation between LSCI and GNI, there are other factors that affect the GNI ratio. As seen in the Analysis of Variance (ANOVA), the significance level is 0,000.

Namely, it is below 0,05. This means this test is meaningful. Anova table which is above explains the relation of two variables with a formula. Therefore, as seen in Anova table, the formula is:

$$“Y=22862982439,022*(X)”$$

The formula proves that the GNI level will rise according to Liner Shipping Connectivity Index level.

Table 3.6. CoefficientsTable

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 LINERSHIPPINGC ONNECTIVITY	22862982439,022	35,37	,721	6,502	,000	15750756331,202	29975208546,841

a. Dependent Variable: GNI

b. Linear Regression through the Origin

As a result, correlation and regression tests displayed the reasonable relation between two data and the relation between wealth and maritime power is verified by these two tests. Moreover, these tests might be important indicators for any state dealing with maritime transportation to analyze its economic growth. Since the relation of these two variables is obvious but not so strong, it is recommended to carry out this study by using more measurable variables for further studies.

### 3.3. Libertarian Thinking Abilities and Maritime Power Relationship Evaluation in the Concept of: The Relation between Liner Shipping Connectivity Index and Capacity for Innovation

In the second part of this thesis, three main results of maritimization process is detailed and supported with historical and social evidences and literature review. But it is believed that this propose is needed to support with quantative approach.

In this sense, the relation between Libertarian Thinking Abilities and Maritime Power Relationship Evaluation is examined by the analyzing the relation between Liner Shipping Connectivity Index (LSCI) and Capacity for Innovation (CI).

#### 3.3.1. Correlation Tests

The data which is used in correlation tests and are listed in Table 3.7 are taken from World Bank Liner Shipping Connectivity Index, 2013 and World Economic Forum, The Global Competiveness Report, 2013-2014.

Table 3.7 Liner Shipping Connectivity Index and Capacity for Innovation Data [88], [89]

No	Country	LSCI (2013)	No Of LSCI	No of Capacity for Innovation
1	China	157,51	1	30
2	Hong Kong SAR, China	116,63	2	29
3	Singapore	106,91	3	18
4	Korea, Rep.	100,42	4	22
5	Malaysia	98,18	5	15
6	United States	92,8	6	5
7	Germany	88,61	7	3
8	United Kingdom	87,72	8	8
9	Netherlands	87,46	9	9
10	Belgium	82,21	10	10
11	France	74,94	11	16
12	Spain	70,4	12	57
13	Italy	67,26	13	31
14	United Arab Emirates	66,97	14	39
15	Japan	65,68	15	6
16	Saudi Arabia	59,67	16	43
17	Egypt, Arab Rep.	57,48	17	111
18	Morocco	55,53	18	129
19	Turkey	52,13	19	45
20	Malta	49,79	20	47
21	Oman	48,46	21	61
22	Portugal	46,08	22	42
23	Greece	45,35	23	117
24	Panama	44,88	24	50
25	India	44,35	25	41
26	Vietnam	43,26	26	86

27	Lebanon	43,16	27	89
28	South Africa	43,02	28	33
29	Sri Lanka	43,01	29	44
30	Sweden	42,32	30	7
31	Mexico	41,8	31	75
32	Denmark	38,67	32	13
33	Canada	38,44	33	27
34	Thailand	38,32	34	87
35	Russian Federation	38,17	35	64
36	Poland	38,03	36	62
37	Colombia	37,49	37	83
38	Brazil	36,88	38	36
39	Argentina	33,51	39	91
40	Chile	32,98	40	63

Capacity for innovation is named as a dependent variable and Liner Shipping Connectivity Index named as independent variable. 40 countries are selected for correlation and regression analyzes. The countries are listed according to their Liner Shipping Connectivity Index level from top to bottom. Besides, their Liner Shipping Connectivity Index is mentioned in the third column.

First, in order to see the positive correlation, the graph is used. The data plotted into the graph as seen in Figure 3.4. and distribution of the data is observed..

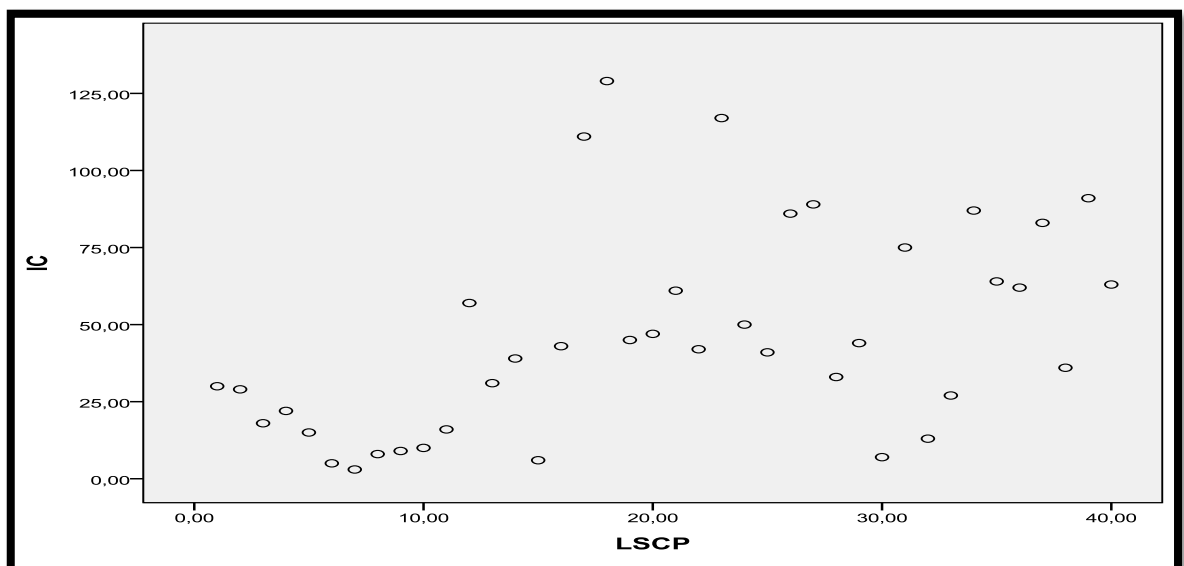


Figure 3.4. Capacity for Innovation and Liner Shipping Connectivity Index Graph (Source: SPSS Program)

### 3.3.1.1. Pearson Correlation

Pearson Correlation test results are which are given by SPSS program detailed as follow.

Table 3.8 Pearson Correlation

		LSCI	IC
LSCI	Pearson Correlation	1	,469**
	Sig. (2-tailed)		,002
	N	40	40
CI	Pearson Correlation	,469**	1
	Sig. (2-tailed)	,002	
	N	40	40

\*\*.

### 3.3.1.2. Spearman Correlation

Spearman Correlation test results are which are given by SPSS program detailed as follow.

Table 3.9 Spearman Correlation

			LSCI	CI
Spearman's rho	LSCI	Correlation Coefficient	1,000	,545**
		Sig. (2-tailed)	.	,000
		N	40	40
	CI	Correlation Coefficient	,545**	1,000
		Sig. (2-tailed)	,000	.
		N	40	40

\*\*.

For both two tests, their correlation is significant at the 0.01 level. This means Capacity for Innovation and Liner Shipping Connectivity Index have a relation and effect to each other. But, the important point is the strength of this relation.

Correlation coefficient is 0.469 in Pearson Correlation test and 0.545 in Spearman Correlation test. So, there is a significant relation but not so strong since the relation of two variables includes many other variables. Capacity for Innovation has wide range and there are more other factors that affect innovation capacity such as R&D, knowledge get from environment, culture, management style and religion etc. On the other hand Liner Shipping connectivity Index does not include all maritime power topics. But this result shows that there is a relation between maritime related areas and innovation and this result support

this thesis suggestion about Libertarian Thinking Abilities and Maritime Power Relationship.

### 3.3.2. Regression Test

In this search, Innovation Capacity is defined as dependent variable and Liner Shipping Connectivity Index is defined as independent variable. Then, the test regression test is run by SPSS 18.0. The R Square which shows the explained variation is shown as below.

Table 3.10 Model Summary (R Square)

Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	,843	,711	,703	30,86231

a. Predictors: LSCI

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

Table 3.11 ANOVA<sup>c,d</sup> and Significance Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91187,201	1	91187,201	95,736	,000 <sup>a</sup>
	Residual	37146,799	39	952,482		
	Total	128334,000 <sup>b</sup>	40			

a. Predictors: LSCI

b. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

c. Dependent Variable: CI

d. Linear Regression through the Origin

R square is 0,711 according to regression test. This means R Square can explain the 0,711 part of the model. So, 0,289 parts is unexplained by this regression model. As mentioned above in correlation part, innovation is a notion consists of lots of inputs. So, although there is a relation between Liner Shipping Connectivity Index and Capacity for Innovation, there are other factors that affect the Capacity for Innovation.

As seen in the Analysis of Variance (ANOVA), the significance level is 0,000. Namely, it is below 0,05. This means this test is meaningful. Anova table which is above explains the relation of two variables with a formula. Therefore, as seen in Anova table, the formula is:

$$“Y=2,029*(X)”$$

The formula proves that the Capacity for Innovation level will rise according to Liner Shipping Connectivity Index level.

Table 3.12 Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		
	B	Std. Error	Beta			Lower Bound	Upper Bound	
	1	LSCI	2,029			,207	,843	9,784

a. Dependent Variable: CI

b. Linear Regression through the Origin

As result, correlation and regression tests displayed the reasonable relation between two data and the relation between Innovation Libertarian Thinking Ability and Maritime Power is verified by these two tests.



#### **4. RESULTS AND DISCUSSIONS: PUZZLE OUT THE 3-LAYER HOLISTIC MARITIMIZATION MODEL**

The world's politic, economic and social lives are shaped over oceans and seas after 15<sup>th</sup> century. Geographical discoveries and the industrial revolution played a crucial role during this process. The western countries discovered the untouched raw materials of the far places of the world. They transport these raw materials to their countries in order to include them to an industrial process. Besides, they built merchant ships and ports in order to survive the maritime transport system. Then, they built navies to protect all this trade system. The western countries such as Portugal, Spain, The Netherlands, France, The United Kingdom, Germany, Japan, Soviet Union/Russia and The United States are the best example of this process.

The terms maritime power, sea power and naval power existed during this period and came into play. It is clear that there is an exact confusion about the definitions of these notions. These notions are used with different definitions by most of the literatures. This study classifies and clarifies the usage of these terms. Here, in this study maritimization is used with the meaning as the “sustainability of the maritime power”. Maritime power indicates the weight of maritimization during a determined period. But, maritimization is a process that includes maritime power. In other words, maritimization is deemed as a process and maritime power is named as the glimpse of maritimization. The weight of maritime power could increase or decrease but the maritimization process continues. Sea power and the naval power are the sub elements of maritime power.

While obtaining maritime power, the countries motioned above followed different ways and methods. In this concept, a new model is developed in order to identify the maritime power elements and maritimization process. Two main approaches are used together as related perceived approaches during establishing the maritime power elements and maritimization model: These are namely *3-Layer* approach and *Holistic* approach. *3-Layer approach* expresses three main layers: sea surface, subsurface and sea bed. Concurrently; *holistic approach* expresses that maritimization model is defined like a puzzle and if one of the elements misses, the model could not be established. Therefore, maritimization is deemed as a process to be planned and managed holistically including all parts of maritime area with all layers of the phenomenon which are sea surface, subsurface and sea bed called: *3-Layer Holistic Maritimization Model*. This model includes 5 main elements such

as maritime economic vision, sea power, maritime vision, maritime culture and maritime education. According to countries, the importance level of the maritime power elements varies so that holistic approach comes into prominence. While obtaining maritime power, the usage weight of the elements could vary but none of them could put out of the maritimization process. For example, according to one view, maritime economic vision and sea power elements could be seem more dominant and important. But, the effect of the other elements (maritime vision, maritime culture and maritime education) to them should not be ignored. On the other hand, maritime vision could be the most significant element according to another point of view. But, maritime vision could not survive without maritime education or maritime culture. These examples could be increased. That is, the model should be evaluated holistically by not extracting one of the elements of the model.

In order to define the maritime power and maritimization process, more models could be developed. *3-Layer Holistic Maritimization Model* is one of the examples that define the way which reaches maritime power.

Maritime economic vision is made up five main elements of maritime power. The share of percentage is given in this study according to 2004 numbers. But, it is obvious that the share of the elements could be changed in the near future. Determining the importance level of them is crucial for making future plans and investments. EU blue growth's 5 main industries such as aquaculture, coastal tourism, blue biotechnology, ocean energy, seabed mining can be the new areas that have potential to develop and determine the future of maritime industry. Therefore, these sectors should be followed closely. For example, marine biotechnology is a new and up and coming industry that can solve the main health problems of the mankind. In this sense, it is obvious that this sector will become more important and be a new revenue source. On the other hand, it has to be emphasized that maritime technology, R&D and IT technologies will share the same destiny and will cover more rates in maritime economics.

Under maritime vision topic, the elements are listed. In this context, a new term added to maritime power sub-elements: *Spiritual Power*. Spiritual power steer nations to think and produce marine related innovative and strategic ideas with the frame of international constitutionalism.

Here, in this study, another new definition is done as well: *Emotional Power*. Emotional power can be defined as a power that affects people thoughts and feelings to steer them to sea and its related areas. That is, two new notions are added to maritimization process by this study.

The 3-Layer Holistic Model encompasses three basic outputs: *Wealth of Nations*, *Security of Country and Innovational* and *Libertarian Thinking Ability*. History, literature review and today's policy is full of the evidences to support this idea. In this sense, Inferential Statistical Methods are used to illustrate the idea of that a nation which reaches maritime power obtains Wealth, Security and Innovational and Libertarian Thinking Ability.

As all navies around the world are mainly built for the security of the nations, the security element of this proposal is a definite result. For that reason, the other two results are analyzed. In this concept, correlation and regression analysis are carried out. The relation between “Liner Shipping Connectivity Index (LSCI)” and “Gross National Income (GNI)” and the relation between “Liner Shipping Connectivity Index (LSCI)” and “Capacity for Innovation (CI)” is analyzed. The analysis illustrated that the relation between these data are significant – reasonable.

In conclusion, it is verified by inferential statistical methods that with the suggested *3-Layer Holistic Maritimization Model*, a nation which reaches maritime power and survive its maritimization process, gains “Wealth”, “Security” and “Innovational and Libertarian Thinking Ability” as the *maritimization's basic outcomes*.

Suffix:

Hereby, in the concept of maritimization process an approach is developed. But, it is obvious that a model is not sufficient to create a *maritimization nation*. There is also a necessity to measure and evaluate the maritime power of the countries. In this sense, the factors that affect maritime power should be evaluated by a mathematical method such as an index. All related sectors performances could be evaluated by this index.

Maritime power has many activity areas as discussed in this study. All related sectors and elements of maritime power should be followed and evaluated holistically. In this context, in order to

- see and evaluate the whole national maritime market,

- follow the world's maritime market activities,
- establish a consulting centre,
- promote and enhance the national maritime industry
- and make long term plans

a *maritimization cluster* is needed such as in developed countries.



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