



# Master Thesis - Master Urban, Port and Transport Economics 2016

*How are the Portuguese port's contributing to Portugal's competitiveness?  
(Hypothesis: Seaports are a vital logistics infrastructure needed for the competitive  
advantage of the economy. The seaports should strengthen the business climate  
instead of being a bottleneck: what is the competitive position of the Portugal ports?  
In the Global Competitiveness report 2015-2016, Portugal is at #25 with respect to its  
port infrastructure. (Schwab and others, 2015)*

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How are the Portuguese port's contributing to Portugal's competitiveness?

## Abstract

Portugal has gone through a harsh economic crises in the last years. Step by step the country is recovering, this is also seen in regards to the national ports. Their throughout in the last years has increased a lot, especially the Port of Sines. Ports are vital logistic infrastructure needed in order for the nation to be competitive, especially given the fact that Portugal has an extensive coastline. If the Portuguese ports are indeed contributing to Portugal's competitiveness is analyzed throughout this paper. A answer to this research question is provided by informational interviews with various actors from the maritime sector. People which are on a daily bases involved wit the Portuguese ports, specifically the Port of Lisbon, Sines and Setúbal, and have a clear notion of the development and bottlenecks the ports face. Research demonstrated that the Portuguese ports have realized the importance of hinterland accessibility which is so often stated in literature. (Notteboom, 2010; Zhang, 2008) This is demonstrated by the construction of new railway lines which will shorten the distance from the Port of Lisbon, Setúbal and Sines to Badajoz (Spain). A competitive advantage which the ports need in order to reach the Madrid consumer region. a long term aim of the Portuguese ports. However, there are issues which the ports need to address in order to increase their competitive position, such as; longer congestion periods, solve once and for all syndicate issues and increase terminal efficiency. In general, with the developments that is seen in the last few years, we can state that the Portuguese ports are contributing to Portugal's competitiveness. They are, through there improvements, acting as an engine for economic growth and helping strengthen the national business climate.

Keywords: port, Portugal, competitiveness, economic growth.

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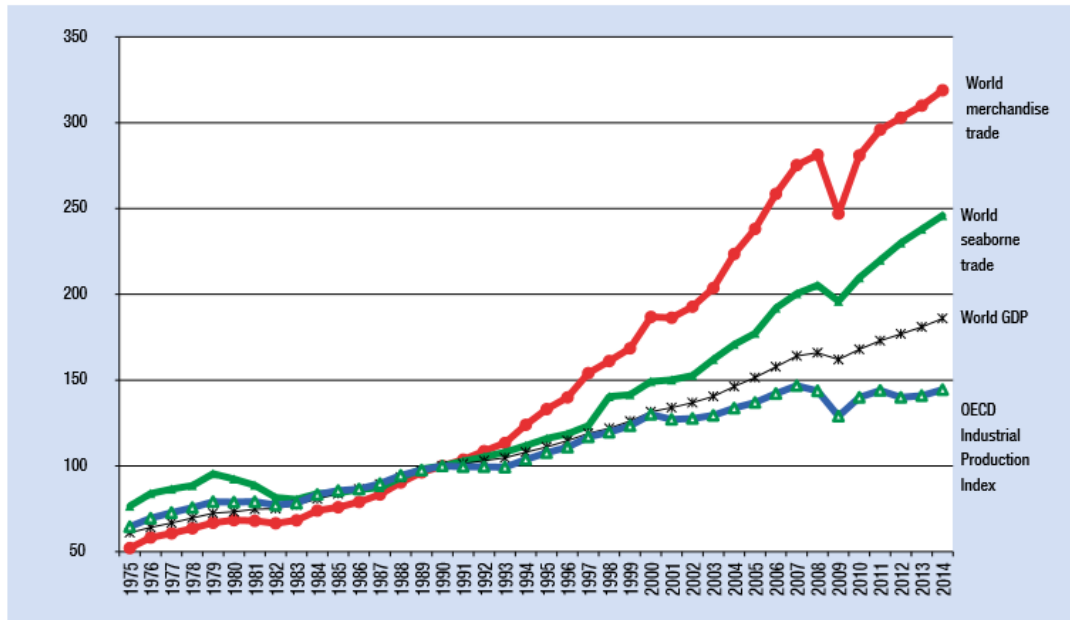
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# Introduction

In the recent years, sea trade has increased drastically mainly due to globalization and customers demand (Figure 1). It is a profitable sector, especially for countries bordering the sea, such as Portugal.



Sources: UNCTAD secretariat, based on OECD Main Economic Indicators, June 2015; United Nations Department of Economic and Social Affairs, 2015; LINK Global Economic Outlook, June 2015; UNCTAD *Review of Maritime Transport*, various issues; WTO, appendix table A1a, World merchandise exports, production and gross domestic product, 1950–2012; WTO press release 739, 14 April 2015.

Figure 1: The OECD Industrial Production Index and Indices for World GDP, merchandise trade and seaborne shipments (1975-2014) (UNCTAD, 2015)

When the recession hit Portugal and Europe, a number of ports throughout Europe witnessed a decrease in throughput. In recent years, numbers have been recovering and ports are determined to improve their competitiveness and become world class ports. Furthermore, increasing transport and labor costs has recently caused major European firms to move their facilities back to Europe; where they once produced. This is known as the concept of near sourcing. For European countries which were/are going through a recession these are good news and highly appreciated, as is the case with Portugal. Not only does this mean the re-opening of factories and hence, employment but it is also has a positive impact on container throughput of the countries ports.

However, this also depends on the efficiency of the Portuguese ports. Some of the determinants of port selection are;

- Geographic location: distance from the open sea, substitute ports, proximity to the market, water depth.
- Infrastructure: docks, hinterland links, capacities.
- Suprastructure: logistics systems, ICT, handling equipment.
- Costs: port expansion and planning implementations, port charges, human resource capital, strike frequency. (Grossmann et al, 2006)
- Reliability

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- Efficiency
- Administrative burden etc.

These are also some of the aspects which the ports are trying to improve in order to increase their competitiveness. In recent years, container unloaded in the port of Lisbon, Sines and Setúbal is increasing drastically (Figure 2).

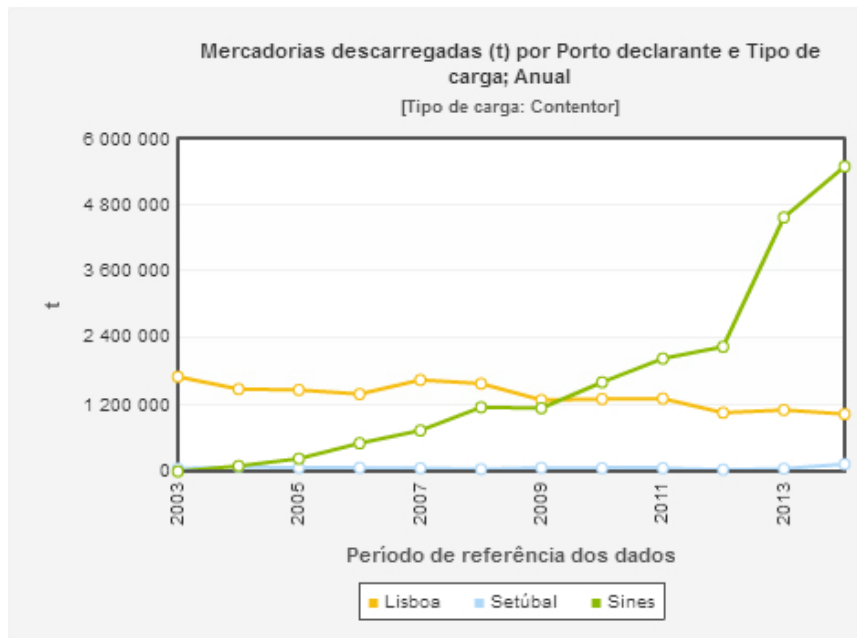


Figure 2: Container Cargo unloaded in the port of Lisbon, Sines and Setúbal. (Estatísticas de Portugal, 2016)

At the same time that the Portuguese economy is slowly recovering, ports are witnessing an increase in container throughput. For example, the port of Setúbal moved nearly 12,000 TEU in the month of January 2016, compared to 9,531 TEU moved in the same month in 2015. A growth of 25%. (Porto de Setúbal, 2016) Whilst, also the ports of Lisbon, Leixões and Sines are expanding their transshipment role and trying to enter the Spanish (mainly Madrid area) hinterland. The Port of Sines has witnessed a large traffic growth. By 2014, Portuguese ports managed to increase its European share to 2.4%. (Notteboom, 2010) In absolute volumes, the port of Sines is the national leader with 45.6% of cargo moved, followed by Leixões with 21.7% and Lisbon with 14.4% and Setúbal with 9.8%, with the remaining 8.5% belonging to other national ports. Despite, the port of Setúbal being in fourth place, it is witnessing recent growth. At the beginning of 2016, the port of Setúbal recorded its new record in TEU movement.

This successful growth in the Portuguese ports leads one to wonder what is actually behind it. There are a number of possible explanations, such as; companies option to near source again, or improvement in hinterland network, or a transport hub function. Hence, the objective of this thesis being to gain a understanding of what is behind this recent growth and how the ports competitiveness has changed. Obviously, this increase in throughput of these ports is beneficial for the ports and Portugal, however, the reason behind this growth is not completely clear and hence interesting to investigate. This leading to the following research question;

*How are the Portuguese port's contributing to Portugal's competitiveness? (Hypothesis: Seaports are a vital logistics infrastructure needed for the competitive advantage of the*

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*economy. The seaports should strengthen the business climate instead of being a bottleneck: what is the competitive position of the Portugal ports? In the Global Competitiveness report 2015-2016, Portugal is at #25 with respect to its port infrastructure. (Schwab et al, 2015)*

Throughout the thesis the following sub-questions will also tried to be answered, with a focus on the Port of Lisbon, Setúbal and Sines;

*Are improvements in the hinterland network, infrastructure improvements, economic recovery reason for growth?*

*Which hinterland area do the Portuguese ports serve?*

*How is the hinterland served (truck, intermodal)?*

*Why is throughput increasing in the last years?*

*From which countries do containers originate and what are destinations?*

*Who are the customers? Are they destined for the national or international (Spanish) market?*

*Can the Portuguese ports help the Portuguese economy and how?*

Given the fact that Portugal is only now starting to slowly recover from a major recession it is important to determine the reasons for the ports to demonstrate growth, hence, making this a important topic to research. Furthermore, it is relevant to determine the competitiveness of the Portuguese ports and how they possibly could develop in the future. This would also have an impact on the Portuguese economy; something which urgently needs to improve. Hence, making this topic of economic relevance for the Portuguese economy as a whole and specifically the development of the Portuguese ports.

In order to answer the research questions and the above sub-questions, informational interviews were conducted with members of the port authority of the Port of Setúbal and Sines (the Port of Lisbon was unavailable) (three ports which are very close to each other and yet show positive growth), terminal operator (Group ETE) and administrator of various logistic parks (Aicep Global Parques). Moreover, the participation of a seminar which took place during the Ocean Weeks gathering in Lisbon (2<sup>nd</sup> to 4<sup>th</sup> of June 2016) enabled to gain a clear view of the port situation in Portugal.

The paper is structured as following; the first chapter consists of a broad literature review regarding relevant issues related to the effect of ports on the national economy and how ports have evolved. This will be followed by a literature review regarding Portuguese ports and their efficiency, amongst other issues (

). In Chapter 3, the current and future situation of the ports of Lisbon, Setúbal and Sines will be analyzed based mainly on the informational interviews conducted previously. Chapter 2 and 3 will be the bases for Chapter 4, which will be composed of a SWOT analysis of the three ports. Lastly, Chapter 5, will consists of concluding remarks and a clear answer of the research question.

# Chapter 1 – Literature Review

This chapter will present a broad review of current literature regarding the effect ports have on the national economy and how the role of ports has evolved. This will be followed by a discussion of port regionalization and factors which contribute to a ports development. Finishing with a review on a port's hinterland and its importance for the port's competitiveness

## Ports and the effect on the national economy

Ports play a number of roles within the logistic and supply chain; they are not anymore restricted to their traditional role of a transshipment point for freight. Ports establish a critical link in the supply chain and the ports level of efficiency and performance, which in turn influences the country's competitiveness. (Mangan and others, 2008) Shancez and others (2003) have demonstrated that port efficiency is a significant determinant of a country's competitiveness. Furthermore, they state that port efficiency can be influenced by public policies. This demonstrating the importance of governmental and port coordination in order to improve a country's competitiveness as a whole.

Moreover, with the constant increase in vessel size, some ports become unable to handle them. This leading to a traffic concentration at only a few ports. Mid-sized ports are taking over a feeder role of larger ports as hub and spoke networks. (Mangan and others, 2008) Prosperity of smaller ports tends to become dependent on the route strategies of the shipping lines. Major shipping lines favour ports which have; a good geographical location in relation to other ports of call in order to achieve the best vessel transit and steaming time; near to marketplaces; have the adequate infrastructure and service; and are flexible when ships are not on schedule. (Livey, 2005) Other studies support the notion that value added activities of a port, (such as transportation and transfer, loading/unloading, processing/distribution, packaging etc.) have a multiplier effect on regional and national economies. (Jung, 2011; Deng and others, 2013) However, often ports consider that by offering value added services, the port can charge higher prices since the port perceives that it is offering services which add value to its customers that other ports do not. This does not necessary mean the port is uncompetitive as long as the port offers services which are perceived by users as a value added service for their business (e.g. customized services). (Song and others, 2008)

Bottasso and others(2014) have analysed the impact of port activities on local development. Results indicate that ports have an effect on local Gross Domestic Product(GDP) (direct effect). A large share of this effect is outside the port region (indirect effect). A 10 percent increase in the level of port throughput will increase GDP in a specific region by 0.01-0.03 percent, whilst the same the increase (10 percent) in the level of throughput will lead to an increase in GDP in regions ranging the port of 0.06-0.2 percent. This meaning an indirect spill over effect of 0.05-0.18 percent. (Bottasso and others, 2014) The existence of positive effects of port activities on



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regional GDP, demonstrates the impact of ports on the national economy and also the importance of further developing the port's hinterland.

An efficient port rises the productivity of prime factors of production (labour and capital) and the profitability of the producing units enables higher levels of output, income and hence, employment. This makes the importance of a port on the national economy evident. (Song and other, 2008) Ferrari and others (2013) studied the impact of port activities on local employment by analysing more than 500 regions in West Europe and found that regional employment is positively correlated with port throughput. A study conducted by Botasso and others (2013) demonstrates similar results. In a region with a million workers, an increase of 1 million tons of port net throughput would determine an immediate increase of about 400 to 600 jobs (depending on model specification). Significant share of break bulk and Ro-Ro traffic tend to have a greater impact on employment with respect to container traffic. Whilst, port activities seem to have a lower impact on service activities, this could be due to the fact that not all port related services are necessarily located in port regions (Jacobs and others, 2011). Whilst, the high impact of port activities on industrial employment can be explained due to bulk traffic; which is one of the main components of the overall throughput in western Europe. (Ferrari and others, 2013)

Other studies have also demonstrated a positive impact of transport infrastructures on regional development. Extensive and efficient infrastructure are essential in ensuring the effective functioning of the economy, it is also important in determining the location of economic activity and the kind of activities that can develop within a country. Well-developed infrastructure reduces the distance between regions, integrating national markets and connecting it at lower costs to international markets. (Schwab and others, 2015) An increase in transport infrastructure, like a ports hinterland connection, might cause an enlargement of important markets for local producers and increase in competitive pressure. More competition induces local producers to be innovative and/or cutting costs with the purpose to maintain or gain a competitive position. (Ferrari and others, 2013) This continues in an ongoing loop, where positive effects on local economic growth and its associated employment increases, further leading to a reduction in transport costs which is associated to the new transport infrastructure.

Ports also tend to attract logistic companies which can lead to logistic clusters, which in itself also leads to economic growth. Logistic clusters<sup>1</sup> are local networks of firms that provide a variety of logistic services (e.g. transportation carriers, warehouses, third-party logistics). They are strategically located to enable efficient transportation. These clusters attract further companies. Logistics is an essential element of their services or a large share of their overall costs. (Sheffi, 2012) Behaviour of the individual firms also plays an important role in the competitiveness of a port. The success of a port cluster is depended on the governance structure of the cluster. (De Langen, 2004) (Nijdam, 2010) In the last years, logistic clusters have had regional and national governmental support and funding in order to promote national/region economic growth.

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<sup>1</sup> Clusters are a set of companies, organizations and institutions which are centred on a specialization. A region can consist of a number of clusters and a cluster can overlap to a number of regions. (Nijdam, 2010)

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Logistic clusters start with a seed investment, which after a while leads to a self-reinforcing positive loop. More companies lead to the arrival of new suppliers seeking to be close to their customers. At the same time, employees develop more skills to meet the needs of the industry. This leading to further growths and the cluster expands. As the cluster expands, it becomes more important for the regional economy, and governments tend to introduce more favourable regulations and public funding for research and/or training. (Sheffi, 2012) Also, as the trade of goods in and out of the cluster grows; transportation costs decrease and the level of service improves. This is due to the fact that higher freight flow enables transportation carriers to operate larger conveyances, hence, reducing operating costs. Also, as freight flows increase, the frequency of services by carrier's increases. As service improves, more distribution and logistics operators are attracted to the cluster, this in turn leads to more freight movement and more carriers; a positive feedback loop. (Sheffi, 2012) Another major benefit of logistic clusters is the creation of jobs. An example is the Port of Rotterdam with an average of 34,000 oceangoing ships and even more inland vessels arrive annually. The logistic-industrial cluster around the port employs directly 94 thousand people and offers indirect employment 84 thousand. (Van der Lugt and others, 2015) Van den Bosch and others (2011) presented a detailed report on the relation between competitive advantage of a country and the impact of port infrastructure by providing an in-depth case study on the Port of Rotterdam. The port's direct and indirect value added equals to around 22 billion euros; this being more or less 3,7% of the Netherlands GDP in 2008. An improvement of international competitiveness of companies throughout the Netherlands would mean a higher value added of 1%. Resulting in more or less 6 billion euros of value added throughout the Netherlands. This being the indirect value added of the Port of Rotterdam. Moreover, researchers concluded that the competition in the Port of Rotterdam leads to the stimulation of innovation and productivity, both of which are important in order for firms to be successful in the long run. However, innovations requires network relations; cooperative relations between firms, knowledge institutes and governments. This cooperation can be improved by initiating strategic cooperation with logistic hub in the hinterland, with North Sea ports or other ports, creating even more strategic value for the Netherlands. (Van den Bosch, 2011) This demonstrates the importance a port can have, not only on the regional economic growth but also the national importance a port can have. Moreover, it demonstrates the effect a port can have which is competitive and functions efficiently as an engine of growth of the nation.

In sum, ports have a positive impact on a country's national economy. Ports can lead to an increase in the country's GDP, whilst also leading to the creation of direct employment at the port but also indirect employment in the port's surroundings by constantly attracting new companies to the region. This possibly leading to clusters.

### Port regionalization

Port development and competition is said to be driven by two developments in the shipping industry. One being containerization; this has led to lower transport costs, shorter transport times and increase reliability. This has enabled large scale global sourcing and production, which contributed to the stimulation of sea shipping demand. (Levinson, 2006) Containerization has also increased competition amongst ports. Intermodal movement of freight

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containers though ports decreased port-handling costs and increased the market range the port serves. However, ports are not exclusive suppliers for a hinterland, these regions can also be reached by competing ports. Hence, ports do not have a monopoly over their hinterlands, which are often overlapping with other ports hinterland. Another development in the shipping industry is the decentralization of public ports to privatization and commercialization of certain port activities. (Brooks, 2004) Private ports lead to more port competition than public ports. These two developments have increased with no doubt port competition. But, hinterland access conditions also have an impact on port competition. (Zhang, 2008)

Furthermore, the formation of regional load centre networks can occur due to the expansion of inland freight distribution centres and terminals, which act a nodes in the development of load centres. However, this only occurs if certain factors are in place;

- Local constraints must be overcome. Constraints such as unavailable land for expansion, environmental constraints.
- Global changes. Such as the development of regional production systems and large consumption markets due to changes in production and consumption patterns.

Expansion to the port regionalization phase occurs gradually and is often a market driven process enforced on ports. Previously, distribution functions used to be separated and controlled by a number of entities; preventing multimodal ownership. Now a days, distribution functions are becoming more integrated and controlled by a single entity. This has removed steps in the transport chain and made it more efficient. An important part of regionalization is the development of land transport. Imperatives of the inland distribution segment of the supply chain, regarding its efficiency, enhance logistics integration and decrease distribution costs. This being a major aspect in the chain, as inland access costs account for 18 percent of the total logistics costs. By having an appropriate regionalized development, costs can be reduced by one third. (Notteboom and Rodrigue, 2005)

Ports are reaching a stage of regionalization where market forces and political influences progressively shape the regional load centre networks; creating linkages between nodes of networks. (Figure 3)

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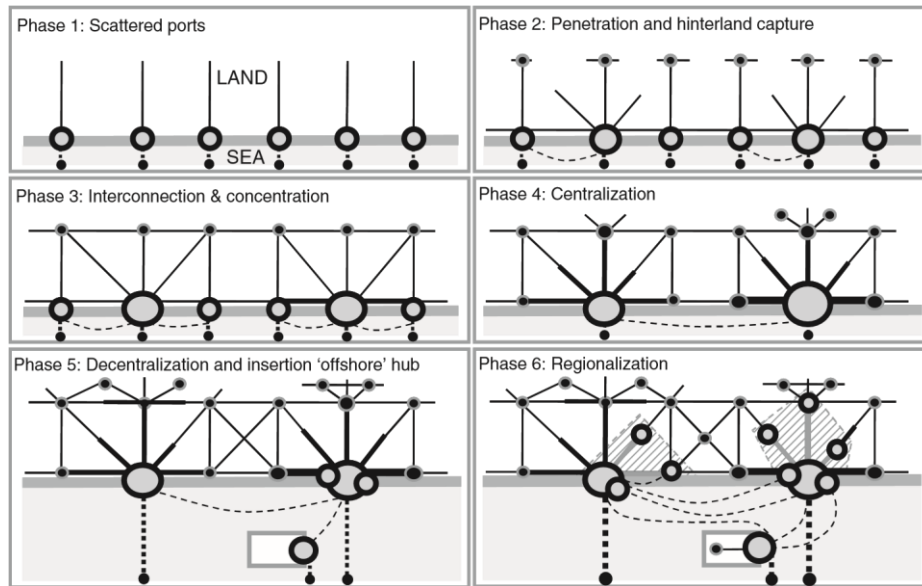
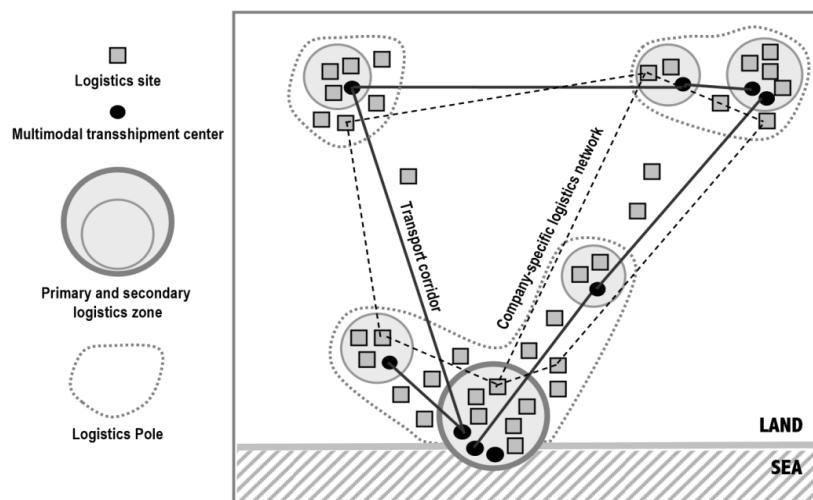


Figure 3: Spatial development of a port. (Notteboom and Rodrigue, 2005)

The regionalization phase incorporates the expansion of the hinterland reached by the port, through strategies which link the port more closely to inland freight distribution centres. Regionalization phase alters the viewpoint of ports and their development into a higher geographical scale; outside the port boundary. In this phase there is a strong functional interdependency and joint development of load centres and multimodal logistics platforms in the ports hinterland. This leads to the creation of regional load centre networks or logistic poles. (Figure 4) A driver for the formation of regional load centre networks is the requirement imposed by global production and consumption networks. Port regionalization enables the development of distribution networks which match the fragmented production and consumption systems. (Jacobs and Notteboom, 2010) The transition to the regionalization phase is gradual and a market driven process; mirroring the focus of the market players on logistic integration. Regionalization is a response by ports to the current market challenges and is an answer to the imperatives of the inland distribution sector of the supply chain, regarding improvements in efficiency, improving logistic integration and decreasing distribution costs. (Notteboom and Rodrigue, 2005)



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Figure 4: Port regionalization and development. (Jacobs and Notteboom, 2010)

Furthermore, the development of rail and barge terminal networks in the hinterland, with the purpose of contributing to a modal shift from road transport to rail and barge, enhances the regionalization phase and system dynamics of ports. Inland terminals transfer part of the distribution function inland and away from the ports, hence, preventing overcrowding of seaport areas. Integrating supply chains has altered the competitive scenario in which ports operate.

Regionalization and an integrated hinterland network promotes the establishment of discontinuous hinterlands (density of hinterland destination/origin of cargo are lower). (Figure 5) The direct hinterland is continuous, whereas, further inland hinterland has a lower density of hinterland destination/origin of cargo, as a result of transport corridors and logistic nodes. Ports are considered an engine for growth and development. The development of offering value added services has duplicated the impact of port activities on the port industry and the ports hinterland. The size of inland service areas depends on the frequency of services and the tariffs of the intermodal shuttle services, if the inland terminals acts as a gateway or not, its efficiency and the price of pre- and end-haul by truck. Often 'islands' are formed in the distant hinterland, where load centres gain a competitive cost advantage compared to other ports. (Bottasso and other, 2014) Clearly, this also increases competition amongst ports.

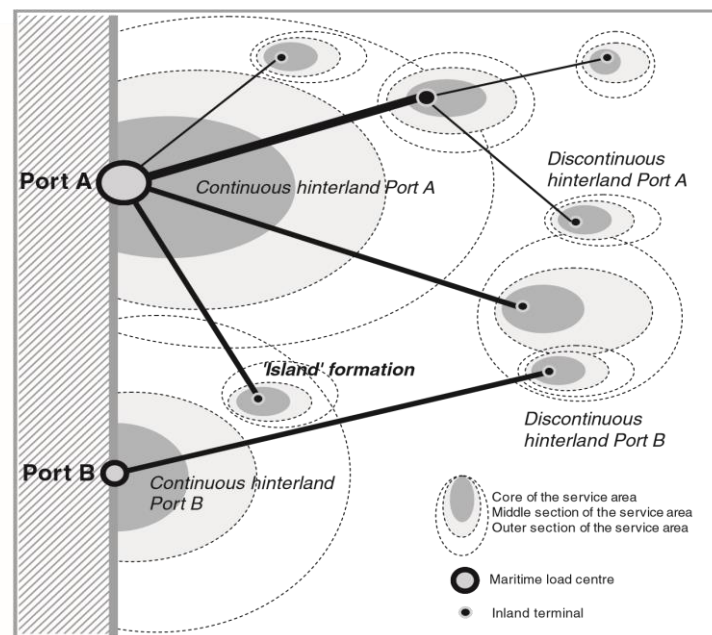


Figure 5: The hinterland of rival ports through the creation of 'islands' in the distant hinterland. (Bottasso and others, 2014)

Moreover, shippers demand for just-in-time delivery and the increase in cargo volumes has forced the maritime transport industry to integrate global services, whilst also optimizing their performance through economies of scale. Now a days ports are not competing as individual places that handle ships but rather as critical links in supply chains. Loyalty to home ports has faded as large shipping lines are expanding their scope to more than one port. Ports are constantly in a competitive fight to bind shippers and carriers which control large volumes of cargo and increases the port value added for the port region. Port choice is a by-product of a

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choice of a logistics pathway. In order to be successful, ports have to analyse what their customers' needs are throughout the whole supply chain and network. This involves rather a supply chain focus of the port authority and a governance framework which enables collective actions within the port community.

Port and terminal selection factors are an important factor which influences port development. Wiegmans and others (2008) analysed port choice and container terminal selection for deep-sea container carriers. Three issues were addressed specifically; buying decision characteristics; port choice strategy; and terminal selection. Results showed that the most important criteria from a carrier's viewpoint are; availability of hinterland connections; reasonable tariffs; and immediacy of consumers (large hinterland). In addition to these characteristics, shipping lines also attach value to; feeder connectivity, environmental issues and the total port portfolio. This study revealed that port selection and terminal selection are not the same. While terminal selection criteria mainly being based on: handling speed; handling costs; reliability; and hinterland connections. Also, decisions factors vary from container carrier, from trade and from port type hence, making it clear that one size fits all approach is not viable. (Wiegmans and others, 2008) Other determinates which influence port selection and a port's competitiveness have been identified by Tongzon and Heng (2005) and Tongzon (2007), based on existing literature;

1. Port (terminal) operation efficiency level
2. Port cargo handling charges
3. Reliability port selection
4. Preferences of carriers and shippers
5. Depth of navigation channels
6. Adaptability to a constant changing market environment
7. Landside accessibility
8. Product differentiation.

In conclusion, ports have evolved due to a number of factors. Starting with the changes in the global supply chain, which has further turned the attention of market players on logistic integration (regionalization). Moreover, institutional changes have influenced port development. Ports have also developed in response to carriers, and other operators, port selection criteria. This has forced ports throughout the world, to alter certain aspects in order to remain competitive and attract operators. All these aspects have led ports to become more aware of means which can enhance their port's competitiveness in relation to other ports.

### A port's hinterland

The role of port authorities has developed from being landlords to aiding with the creation of platforms where a number of stakeholders come together to identify and address issues regarding logistic performance of the port. Port authorities now focus on sustainability and accessibility of the port; this depends mainly on the hinterland transport the port has in place. (Notteboom and Rodrigue, 2005)

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An efficient hinterland access is a key determinant for ports competitiveness. The increasing focus on hinterland is closely linked to the increase in focus on intermodal transport. The rising increase in container volume has made it economically and socially more attractive to opt for intermodal transport. Furthermore, intermodal transport is important for ports to remain accessible, as roads are getting more congested. This has been demonstrated in the case study of the Port of Barcelona, Spain, conducted by Berg and De Langen (2011).

Notteboom and Rodrigue (2009) stated that in the initial phase of port development; meaning a small throughput and cargo is destined within a short distance of the port. Road is being used dominantly to serve the hinterland. As the port develops and enters the regionalization phase; throughput increases and hinterland connections are expanded. At this stage intermodal transport becomes of more importance due to economies of scale (lower transport costs). Moreover, investment by port authorities in the hinterland creates network effects. These network effects occur when services (e.g. rail network between the port and inland destinations) are used by an increasing number of shippers, in this case. As the number of users (shippers) increase, the services becomes more valuable as the quality of the service increases (e.g. higher frequency) together with a decrease in transportation costs. There is also an indirect effect through additional services which are developed as a consequence, such as; information systems to increase efficiency and transparency. In general, these effects increase the value of the services. (Katz and Shaprio, 1985) However, ports can be seen as two sided platforms, on the one side are the shipping lines and on the other are the hinterland transport companies. Combining both platforms makes the platform stronger and is essential, since the value of a platform to users depends on the number of users on the other side of the network. (Berg and De Langen, 2011)

Zhan (2008) examined the interaction between hinterland access conditions and port competition. Competition between ports is seen as completion between alternative intermodal transportation, while hinterland access conditions are analysed through the corridor facilities and inland roads. Zhang (2008) found that when ports compete in quantities, an increase in corridors capacity increases the port's output, reduces the rival port's output and increases the port's profits. Also, an increase in inland road capacity possibly increases the port's output and profits. Whilst, increase in land capacity reduces local delays and restrains the negative impact of output increased. These conclusions demonstrate the importance of hinterland access conditions and port competitiveness.

Moreover, freight distribution systems are becoming more integrated and port-hinterland relations are becoming an essential component of freight distribution. Global commodity chains are taking advantage of better access to markets, labour and resources, which allows them to fragment production and consumption, whilst at the same time maintaining the reliability of frequency and level of service. Hinterlands have become a key component for the efficiency of the supply chain. The main drivers which impact port hinterland are;

1. Macro-economic hinterland: is an issue of transport demand with regards to origins, destinations, but also of the whole transactional setting where actor's demand evolves. This has led to distribution centres, which act as intermediaries for ports. Distribution centres tend to be clustered as a result of economies of agglomeration. This is a

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demonstration of the discontinuity of the majority of port hinterlands. Other macro-economic issues which play a factor in attracting freight traffic are; interest rates, exchange rates, prices, etc.

2. Physical hinterland: refers to transport supply, the network of transport infrastructure, modes and terminals between the port and its hinterland. Means which are important to achieve regional accessibility. Intermodal transport improves not only the accessibility but also the efficiency of hinterlands since it creates a link between the port and regional customers.
3. Logistic hinterland: how the port is organized and how it takes place given macroeconomic and physical settings. Decisions need to be made regarding the mode choice and the sequence/synchronization of maritime and inland freight distribution. Since logistics networks link production, distribution and consumption, they have become a determined of the competitiveness of global commodity chains.

These three concepts are interrelated; alteration in one of them will have a ripple effect on the other two hinterland factors. For example; exchange rate alteration can lead to a shift in the trade balance between two nations. Shipping lines may hence adjust their freight rates. Whilst, the changes in trade balance can also have an effect on the capacity of utilization of terminals, corridor infrastructure and physical assets. (Notteboom and Rodrigue, 2007)

In sum, the changing port-hinterland relation has had a clear impact on port development. A port's hinterland has developed drastically in the last years in response to customer demand mainly. However, the port authorities face issues related to the infrastructural part of port regionalization. Whilst, port authorities try to enhance the intermodal capacity of the port with a heavy confidence on the performance of infrastructures and transport services; port authorities are limited to a certain extent. Firstly, hinterland infrastructure level is dominated by public authorities who tend to take social and political aspects and functional restraints into their decision. Secondly, the logistical hinterlands tend to be dominated by market players, which are not obliged to give account to the port authority. Hence, port authorities have realized the need to improve their hinterlands in order to be competitive but at times they are constrained due to other market players.

### Importance and development of a port's hinterland

Port regionalization has enabled a higher degree of integration between the maritime and inland transport systems, especially barge and rail, which has led to less congestion, and more efficiency. Developments in the global supply chains have increased the pressure on maritime transport, port operation and inland freight distribution. (Rodrigue, 2010) Inland accessibility has become a foundation for port competitiveness.

A good relationship between a port and their hinterland is now a days essential for the ports competitiveness. Global trade inclines gateways and their maritime and inland connections. Hinterland shapes the growth potential by offering cargo rotation for inbound and outbound container flows. (Rodrigue, 2010) This led to the development of corridors leaning on rail or barge connected to inland terminal facilities (which can act as satellite terminals, load centres



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or transmodal facilities). In order to create these facilities, port authorities need to work closely with terminal operators, real estate developers and local/regional governments. None the less, European countries have been prone in creating multi-gateway port regions which have access to the respective hinterlands. (Figure 6) This is partially also linked to the new form of collaboration between the various actors within the terminal chain.

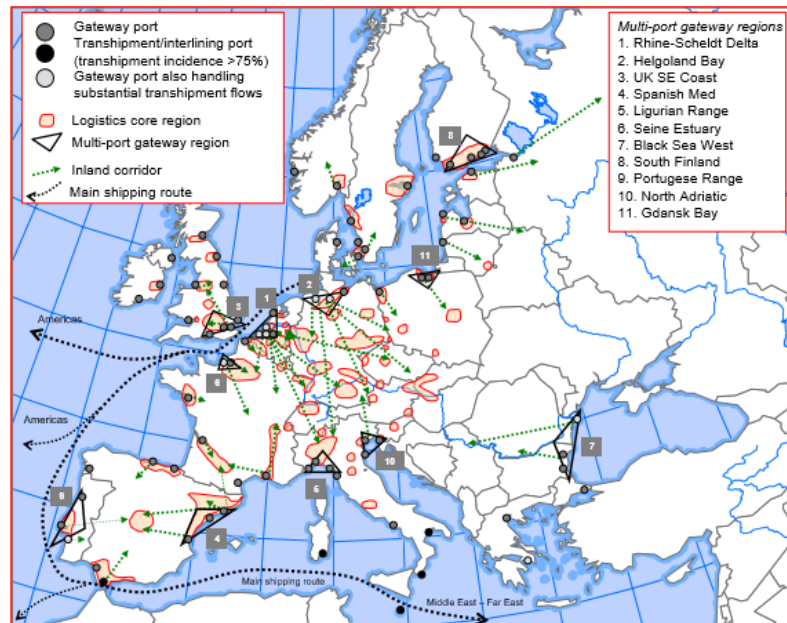


Figure 6: European container port system and logistic core regions in the hinterland. (Notteboom, 2008)

In the last few years, intermodal transport is slowly taking a strategic role, especially for cargo islands' in the immediate hinterland of rival ports. Logistic sites located in the immediate hinterland of a port generate a greater value of flexibility to a multi-gateway port region since it allows the port to offer more routing options for import and export cargo. Routing flexibility is a fundamental advantage for the logistic attractiveness of a region given the increase in reliability and capacity issues. An inland corridor allows load centres to access the captive hinterland of other ports. Existing dense networks of direct rail and barge shuttles to proximate destinations are complemented by indirect inland services to more distant destinations constructed around one or more inland hubs. Cargo concentration on a few truck lines enables economies of scale in inland shuttles and higher frequencies. (Notteboom, 2010) Distant hinterland benefit from a port's strong local cargo base since it allows for frequent deep-sea liner services. Along the years, gateway ports in the Mediterranean have gained a better connectivity in the global shipping networks than before, this giving the ports an opportunity to take advantage from the economies related to larger vessels. The challenge of the periphery concept supports the transition of a single gateway situation into a multi-port gateway region. Factors which contribute to the entry of newcomers are;

1. New requirements regarding deep-sea services (e.g. maritime and inland access, availability of terminal).
2. Strong growth in the container market.
3. Diseconomies of scale in current ports (e.g. lack of space for expansion)

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Moreover, logistics related to the hinterland involves numerous actors and activities, hence, there is a great deal of collaboration and coordination needed for the hinterland network to work effectively and efficiently. Available hinterland services depend on the port's location and infrastructure. Some ports are linked to inland waterways, whilst others are limited to land-based transport modes. According to Bergqvist (2012), this intensified inter-port competition in combination with the complexity of hinterland transport and its infrastructure and strategic transshipment nodes, has made hinterland connectivity an essential element of a port's value proposition. Whilst, containerization in combination with intermodal transport options has allowed ports hinterland to expand. (Song, 2003) By offering a high capacity of transport modes (e.g. trains, barge), there have been increases in the capacity of hinterland transport. Rail and barge, both bring with them environmental benefits, economies of scale and faster throughput in ports. In order to maximize these advantages, the port authority needs to find the optimal mixture of transport modes and setups. Once this is achieved, the port is operating its hinterland effectively and efficiently. Furthermore, the demand by customer for more sustainable transport options has influenced the design of hinterland transportation modes. Both, barge and rail not only provided economies of scale but also perform better over longer distances. (Bergqvist and Egels-Zandén, 2012)

“The competitive battle among ports will increasingly be fought ashore. Hinterland connections are thus a key area for competition and coordination among actors.” (Notteboom, 2008) In recent years, the expanding hinterland coverage and the shift from captive to contestable hinterlands has altered the view of ports to being competitive organisations. Most European container ports act as gateways to extensive inland networks. Hinterlands expanded due to the pressure on ports of containerization and the development of large container vessels. This leading to higher port throughput and often congestion. Expanding to the hinterland was the main form of handling the increase in volumes. Furthermore, the development of intermodal corridors by rail, barge and inland terminals enabled deep hinterland penetration. The liberalization of barge and rail in combination with increase in efficiency of transport services on inland corridors had a structuring effect on the hinterland which is reached by ports. The size of each inland service region depends on the service frequency and tariffs on intermodal shuttle services by rail and/or barge. The more intermodal transport is a competitive advantage of the port, the more the port is dependent on intermodal carriers offering services on the intermodal corridors. Notteboom, (2008) Sammons (2008) and Sammons and Magala (2007) state that the port choice is now a days considered a by-product of the decisions process of a logistic pathway. Ports are mainly being chosen on the bases on their ability to minimize the sum of sea, port and inland costs. Moreover, concerns regarding capacity limitation in ports and inland infrastructure make supply chain manager's base their port and modal choice on reliability and capacity. Song and Panayides (2008) concluded that some of the most important factors which contribute to port/terminal integration within its supply chains are linked to technology, value added services, client relationship, and the facility of intermodal transport. These factors go beyond the previous boundaries of ports, demonstrating the need for ports to focus on the idea of port regionalization as a phase in the development of load centres and port systems. Regionalization expands the hinterland that a port reaches through a number of strategies which link it more closely to inland freight distribution centres. In this phase of

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development, the port is characterized by a strong functional interdependency and joint development of specific load centres and multimodal logistic platforms in the hinterland. This leading to the formation of a regional load centre networks or a logistic pole.

The importance of local hinterland in a port's cargo base is the result of large consumption and production centres (e.g. automotive or petrochemical clusters). This in itself is result of emerging logistic poles consisting of a set of gateway ports and logistic zones in the immediate hinterland. Geographical concentration of logistics companies creates synergies and economies of scale, while making the location more attractive and encouraging a concentration of distribution companies in a certain area. Regional trucking lines enhance the location of logistic sites in ports and inland ports, whilst also along the axes between ports and inland ports. (Notteboom, 2010) On the one hand, ports are a central node in driving the dynamics in large logistic poles, whilst a at the same time, ports rely on inland ports to maintain their attractiveness. The geographical concentration of logistics sites stimulates the development of inland terminals. A corridor towards the inland terminal network creates the necessary margin for further growth of seaborne cargo traffic in ports. Hence, inland terminals have an important satellite function. The increase in inland ports and the associated logistic corridors enhances the port regionalization process. (Notteboom and Rodrigue, 2005)

In sum, hinterlands are the backbone of ports, a growing demand for routing flexibility increases the competition for distant hinterlands between multi-port gateway regions. Container shipping lines are becoming more aware of the importance of ports hinterlands, given the fact that inland costs of the total costs for container shipping range between 4-80 percent. By offering a competitive and well accessible hinterland, ports offer a competitive edge which can aid in the port's growth and further development.

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## Chapter 2 – Portuguese Ports

Following a board review on ports, this chapter will be focused specifically on Portuguese ports. The aim of this chapter is to provide an overview of the current situation of the ports and how this hinders or eases the development and competitive position of the Portuguese ports in relation to other European ports, especially the Spanish ports since they are Portugal's main competitors. This chapter acts as part of the bases for a SWOT analysis. First a brief introduction to the Portuguese ports will be present, followed by a discussion of the ports efficiency, and governmental policy changes. This is followed by a review of the railway connections to/from the ports to the Spanish hinterland. The case of a national shipping line will be presented, which managed to overcome the shortage of cargo and now ships regularly to Asia, Africa and America.

Given Portugal's extensive coastline (1,794 Km) and its history with the sea, it is no wonder that now a days ports play an important part of the country's economy. Portuguese ports are located on Portugal's west coast (Figure 7), collectively being defined as the 'Portuguese Range', establishing a multi-port gateway system. (Figure 8)



Figure 7: The five main Portuguese ports. (Mitchell, 2012)

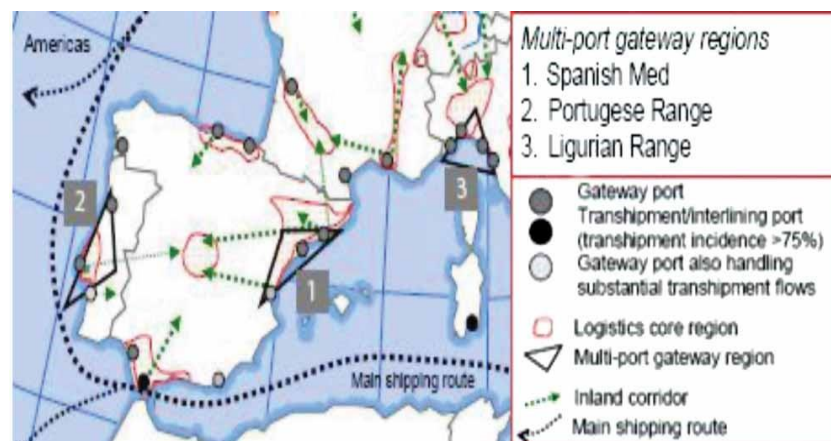


Figure 8: Portuguese and Spanish shared hinterland. (Notteboom, 2010)

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Portuguese ports can benefit from port regionalization into the Spanish hinterland; especially the Madrid region and Northern Europe. This would lead to a competitive gateway to other foreland regions along the Atlantic Ocean (e.g. South- and North-America, West- and South-Africa). Hence, contributing to Portugal competitiveness in general, as national companies could also take advantage of a competitive gateway to export their products. The Portuguese ports are within geographical proximity between each other, serving overlapping hinterlands, this allows them to constitute a multi-port gateway system. (Figure 9) (Santos and others, 2015)

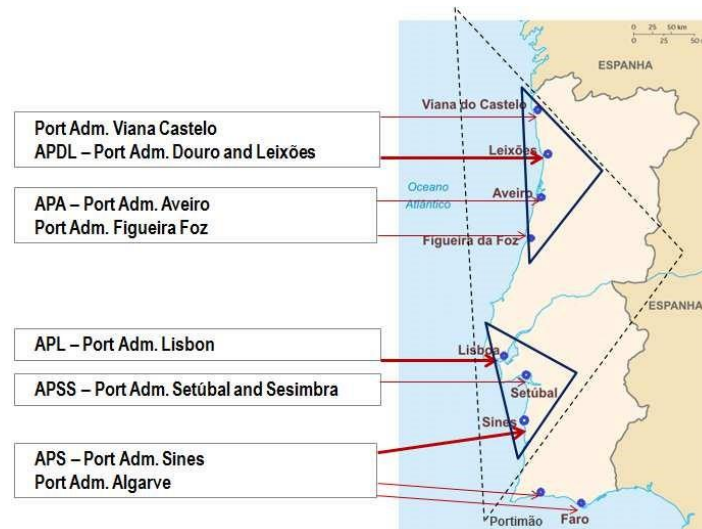


Figure 9: The Portuguese range and the governance structure (Santos and others, 2015) (Since the beginning of June 2016 the Port Administration of Lisbon has been consolidated with the Port Administration of Setúbal and Sesimbra)

With the national customer base being saturated, which in itself is a problem, and the national ports fulfilling the national customer base, Portuguese ports in the last years had no other alternative but to try and captivate the Spanish market. Extending the Portuguese ports hinterland to Spain is not an easy task, especially given the fact that Spanish clients tend to be loyal to their own logistical chains and also according to Alonso and Bofarull (2007), loyal to their own ports which serve them well. Santos and Guedes Soares (2015), investigated Portuguese port regionalization into Spain, concluding that further developments in infrastructures (e.g. in ports, railway and intermodal terminals) are still needed and are not fully developed at this point in time. In general Spanish regions do not use more than four Spanish ports to move 90 percent of their cargo (Caldeirinha, 2008).

## Port Efficiency

Regarding Portuguese port's efficiency, Dias and others (2012) analysed the performance of the main Iberian container terminals with regard to their efficiency. They conclude that in general most container terminals are efficient, whilst different levels of performance were observed. Some terminals such as Sines, Leixões, Alicante, Valencia and Algeciras, demonstrate higher levels of performance (the port of Setúbal was not included in the study). Supporting this study, Cullinane and Wang (2009) analysed the efficiency of European ports. This study included container terminals of the Port of Lisbon and Leixões, ranking 0.94 out of 1 on the efficiency scale. Barros and others (2004) also analysed the efficiency of Portuguese and Greece ports. Results demonstrated that the Port of Lisbon, Sines, Setúbal are efficient (1 on the efficiency scale). However, both ports demonstrate decreasing return to scale meaning

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that an increase in inputs is leading to a less than proportional increase in output. Also, in the Global Competitiveness Report 2015, the quality of the port infrastructure of Portugal ranked 25 (out of 140 countries), while Spain ranked 12. This demonstrating the large gap that still exists between the ports of these two countries. Clearly, Portugal still has a long way to go regarding infrastructure quality. In order for Portuguese ports to further increase their efficiency, Portuguese ports should improve their infrastructure in order to be able to become more competitive in regards to Spanish port infrastructure. Infrastructure improvements would lead to lower costs, not only for the ports but also for the hinterland; a competitive advantage Portugal could gain. Another suggestion is opting for a containerised focus; this would increase their activity and improve their efficiency. Given the fact that containerised ports have higher efficiency levels than less containerised ports. (Liu, 2010) This being due to technological advantages of containers.

As study conducted by Caldeirinha (2011) on Spanish and Portuguese multi-region ports demonstrates that Portuguese ports in comparison to the Iberian port average reach minimum or medium values in all categories studied. (Figure 10) The port of Lisbon, being a regional port, performs above average in bulk cargo movements and water depth. Whilst the port of Sines, performs above the Iberian Peninsula port average in regards to sales volumes per ton and also water depth.

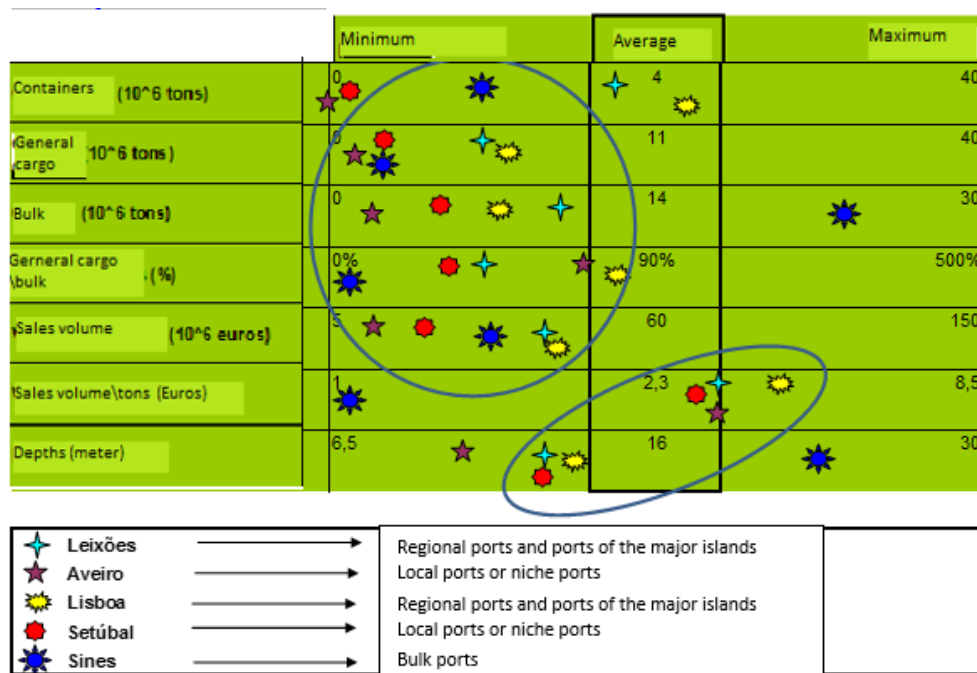


Figure 10: Portuguese ports comparison to Iberian peninsula average. (Adapted to English from Caldeirinha (2011))

The Portuguese port system has nonetheless, demonstrated a modest growth path (see Chapter 3 for data) in the last years. Portuguese ports such as Lisbon, Leixões and Sines are trying to expand their business by developing a transshipment role (e.g. shipping line MSC, is using the port of Sines), whilst, also trying to enter the Spanish market (e.g. Madrid area) through rail corridor formations and developing dry ports. These are all essential elements which would improve the competitiveness of the Portuguese ports and hence, of Portugal.

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## Government aims and Port administration

Being public enterprise entities, Portuguese ports depend on government subsidies. The concept of subsidies is intended to provide incentives for an increase in productive efficiency; hence, allowing ports to share their social gains from efficiency in the form of employment and local growth. The Portuguese Port Authority have administrative and financial autonomy combined with a flexible management with the aim of achieving positive results. In the last years Portuguese ports have increased their investment spending and hence, their required funding. An example of this is the enlargement of the PSA owned Terminal XXI, a container terminal in the Port of Sines with a total capacity of 375,000 TEU. Nonetheless, the increase in competition amongst ports has led to an increase in need for investment as a whole. (Castillo-Manzano and Assencio-Flores, 2012)

Barros (2003) analysed the technical and allocative efficiency of Portuguese port authorities, with the aim to find out if the government policy is achieving its aim. Results are a blend; leading the author to conclude that the incentive regulation is not achieving its aim. Since 2003, port policy and aims have altered slightly with the new government in place (since 11/2015). In the government program XXI, the government aims to achieve by 2019 the following objectives;

- Implement the Janela Única Logística (JUL, Logistic Single Window) and expand the Janela Única Portuária (JUP, Port Single Window), which is already being used by all Portuguese ports, to all transport forms and to national and Spanish dry ports. The JUP is a system which up till now was only used by the Portuguese ports in order to facilitate the entrance and exit of vessels from the ports. Everything is done electronically, hence, being also more environmental friendly. (EuroTransporte, 2013) JUP has been used since 2008 and has demonstrated to increase the efficiency and the competitiveness of the ports. This being also the reason to implement it to all forms of cargo transport; becoming JUL.
- Create a Fatura Única (One Bill), this enabling all services to be billed at once and not separately for each service. Leading to more efficiency.
- Facilitate the clearance of goods to dry ports, where goods are temporarily deposited with the aim to improve the competitiveness of the Portuguese ports and the national export sector.
- Increase the capacity of the port infrastructures, as well as the railway connection to the European hinterlands. With priority in a railway connection to the port of Sines.

(Governo Nacional, 2016)

If these objectives are all implemented then the logistic infrastructure of Portugal, especially the ports, would improve. This is an essential element needed for the competitive advantage of the Portuguese economy. JUL is strongly supported by all members in the logistic chain, starting from Port authorities, logistic operators to companies which export/import goods through ports. JUP was proven to be an innovative and successful implementation which has made the Portuguese ports more efficient and decreased bureaucracy. If this concept is extended to all forms of cargo transport (e.g. truck, railway) then the whole supply chain become efficient. This will also please customers since a lot of bureaucracy issues disappear and clearly

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improve Portugal's competitive position compared to other countries which do not have this program in place.

### Railway connections

Railways have become an essential element in port competitiveness. It enables ports to reach hinterlands more efficiently. Moreover, there are railway terminals in all five main Portuguese ports (including the port of Lisbon, Setúbal and Sines), this ensures efficiency and increases competitiveness of the ports.

There are two railway companies operating in Portugal; Comboios de Portugal (CP), specifically CP Carga (Cargo) which recently became renamed to MEDLOG and since 2008, Takargo. CP is a public enterprise which provides transport services, whilst the infrastructure is managed by Rede Ferroviaria Nacional (REFFR). Contrary, Takargo is a privately run enterprise, which only started operating in Portugal after a legislation was implemented by the European Union imposing the existence of private companies in the railway sector. (Alonso and others, 2010)

The Spanish and Portuguese railway lines are connected at three border crossings; one in the north of Portugal (Valença-Vigo) and the other two in the east (Villar Formoso-Salamanca and Elvas- Badajoz). The two interconnection in the east are part of the TEN-T rail freight corridor nº 4 (part of the Atlantic Corridor). Whilst, another interconnection is under construction (Evora to Badajoz). For many years this railway line has been planned and finally it is supposed to be constructed until 2021. It is an essential line for the port of Sines, which currently needs to transport its cargo first up to Lisbon – Entroncamento and then down again to Elvas, ending in Badajoz. (Figure 11) (Nascimento, 2016) Clearly, an inefficient means of transporting the cargo. This situation is also a pity for a fast growing port that Sines is, since it hinders its competitiveness with regard to other ports and their hinterland access. After many years, the European Union has agreed to subsidize partially the construction of a direct line to the Spanish boarder; construction of a railway track between Evora and Badajoz (build 92Km). The total cost is estimated to be 773 million Euros, 310 million Euros the Portuguese government will contribute to the project. (Ferreira, 2015) This railway track would save 3 hours of transport duration for goods coming from Sines to Badajoz, an increase in tons per locomotive from 1040 to 1400 tons, more than 150 'un-useful' kilometres would be saved and the trains will be powered by electricity not a combination of electricity and diesel, as it is currently the case. The port of Lisbon and Setúbal would also benefit from this new railway; Lisbon would become 2 hours away from Badajoz. (Jornal Portugal Ferroviário, 2016) This is an illustration of the impact that new infrastructure improvements have on the ports efficiency and means to improve Portugal's competitiveness.

The Extremadura municipality is very interest in the establishment of this railway line, since they also see the Port of Lisbon, Setúbal and Sines as their natural ports due to proximity. The Badajoz area has a lot of fruit, which would equal 250,000 TEU, such as cherries which Spain export to the north of Europe. If they would export through the Portuguese ports, one day is saved. This meaning the fruit can ripe longer, meaning higher quality and hence, they can change higher prices and make more profit. Whereas, if the fruit was send to the Port of Seville, the fruit would have to be collected two days earlier and then the vessel would have to pass along the whole of the Portuguese coastline in order to reach the north of Europe. Moreover, the Extremadura region also imports a lot of raw materials for their factories. (Nascimento,



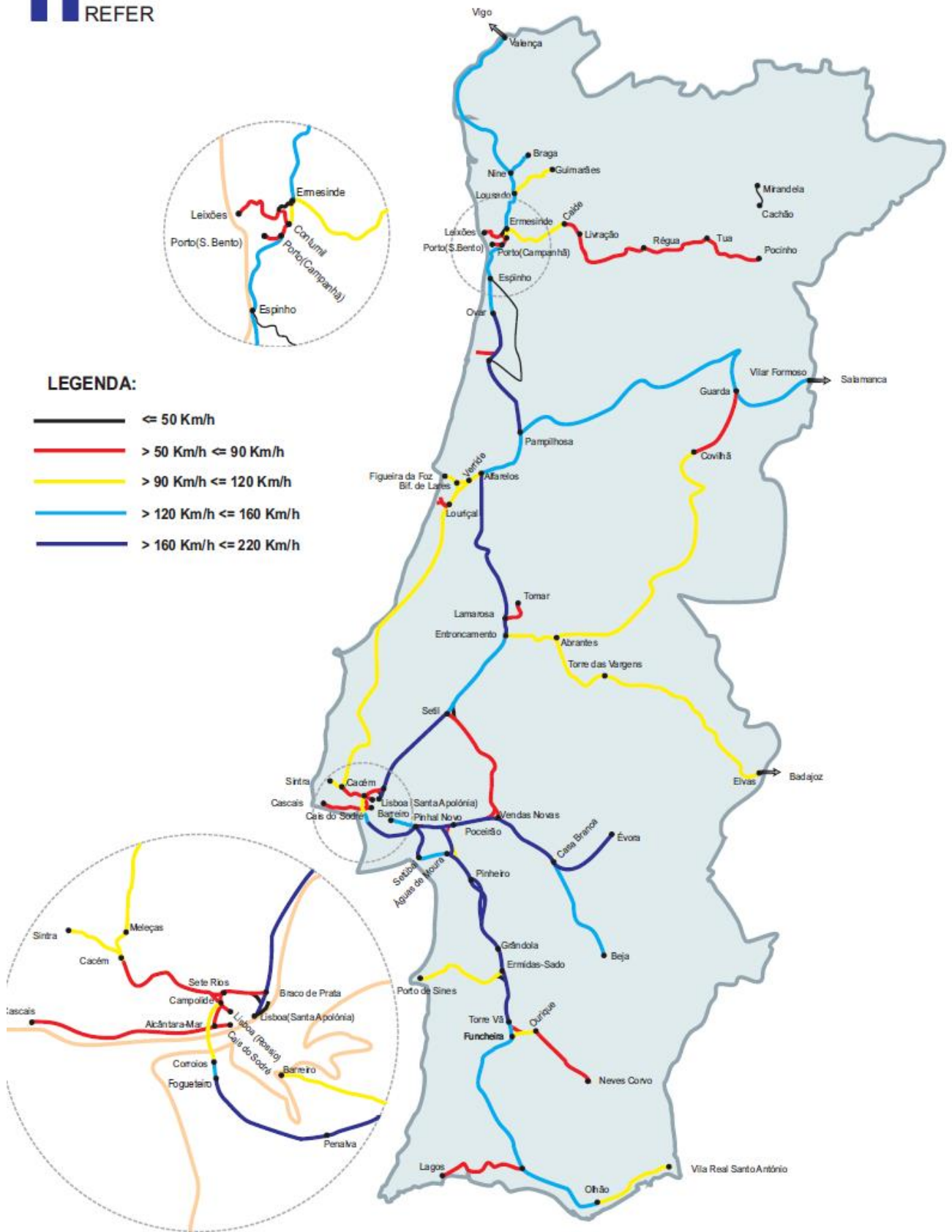
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2016) Clearly, it is faster for Spain to use Portuguese ports to reach the north of Europe, Brazil, Africa and the United States of America. (Calderinha, 2016) Obviously, Spanish cargo when opting for Portuguese ports has to travel more by land but less by water. The new railway will also insure that longer trains can be implemented, hence being more efficient. This decreasing the unit cost of the transport. All these infrastructural improvements will improve the competitive advantage of the Portuguese ports.

The agreement made between the Port of Lisbon, Setúbal and Sines with the dry port of Badajoz is made with the aim to first captivate the Extremadura/Badajoz region (fruit and vegetables) and in the long term to reach the Madrid hinterland, which has a very large consumer market. There is the notion that the ports need to reach a larger consumer market and this is one of the first steps to reach it. (Soares, 2016) There are already dry ports on the Portuguese side, but not so many on the Spanish side. Portuguese logistic agents try via truck to captivate for Spanish goods near the border. They reach a hinterland of a maximum of 150Km distance from the Portuguese ports. The issue here is that, Spanish companies prefer to do business with Spanish dry ports due to language barriers or/and legislation. Whereas, with the agreement made by the Portuguese ports and Badajoz dry port, the goods remain under Spanish legislation but are transported via Portuguese ports. Moreover, given the fact that Portugal only borders with Spain and Spain having the Iberian rail gauge, Portugal's railway also has the Iberian rail gauge in order to ensure compatibility. According to Dr. Carlos Vasconcelos, board president of MADLOG (railway company) and vice-president of the national shipping agents association; this is unlikely to change in the next years, only if Spain would suddenly decide to alter their gauge. Whilst rail speed is lower on the Portuguese side, the average velocity that cargo trains run in Portugal is 70Km/h and 80Km/h in Spain, the maximum train length is restricted on the Spanish side (which are lower than the European standard of 750m). (Alonso and others, 2010) Furthermore, there are rail gauge and voltage differences at the French border with Spain. This hinders and makes the rail network as means to reach further hinterlands limited for Portuguese ports. An alternative is opting for short sea shipping from Setúbal to the rest of Europe. (Perreira, 2016) (Silva, 2016)

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REFER



Diretório da Rede 2016

Figure 11: Portuguese Railway Network (colors indicate speed of each railway) (Infraestruturas de Portugal, 2015)

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Furthermore, the Port of Lisbon, Setúbal and Sines have made an agreement with the dry port of Badajoz (Plataforma Logistica del Suroeste Europeo; PLSWE), which is still under construction, with the strategic thought of captivating the Spanish hinterland region Extremadura. (Figure 12) In this region there is a strong industry which obviously would be beneficial for the Portuguese ports if the Spanish companies in the region opt for Portuguese ports rather than Spanish ports.

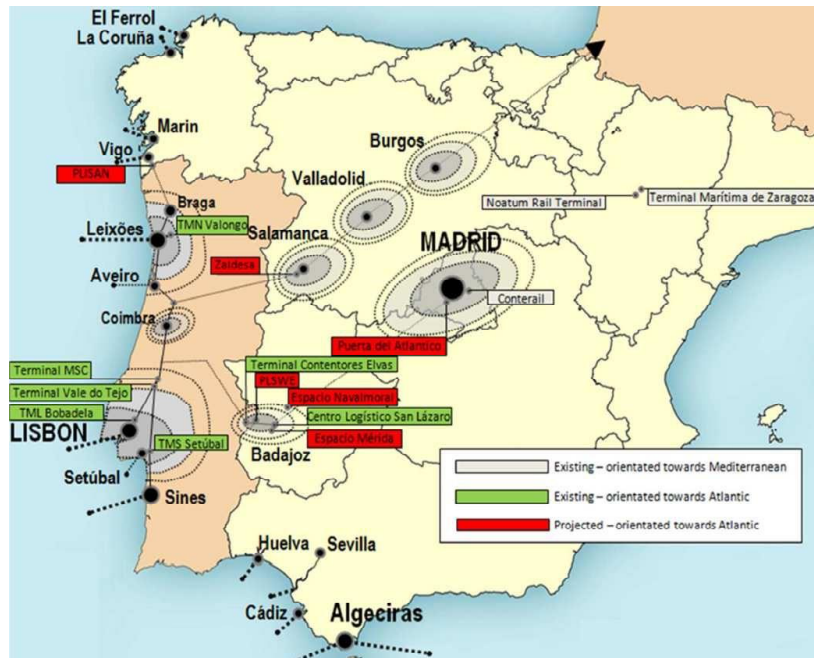


Figure 12: Location of inland terminals in Portugal and Spain. (Santos and others, 2015)

When looking at the operational structure of the Portuguese railway and the capacity utilization. Rail freight operations in Portugal are carried out by private companies; sixteen in Spain and three in Portugal. (Foment, 2013). Agreements have been made between the Spanish public railway company; RENEF and the Portuguese public railway company; Comboios de Portugal, under the name of Iberian Link with the aim to increase the traffic between the two countries and boost the maritime-inland container market. (Castillo-Manzano and Assencio-Flores, 2012)

## Concession Period

Another issue is the concession periods of terminals, which according to Calderinha (2011) should be increased in order to enable a constant market competition through concession contests. This leading to quality improvements and price decreases. The audit office (Tribunal de Contas) has also defended this in the past.

Certain member of the parliament do not seem to realize that Portuguese ports need to improve certain aspects in order to become more competitive in relation to other European ports, especially in comparison to Spanish ports. Clearly, they are acting as a bottleneck and hindering Portugal's development. Some parliament members even want to decrease concession time. The argument behind this concept is that shorter concessions lead to more competition and lower prices. This also having been proposed by the European Union Commission in their port package. However this being an illusion, since even if prices are lower, efficiency is also lower. Normally old equipment is used which means more loading time and clearly, less efficiency.

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Eng. Francisco Nascimento (Group ETE), terminal administrator, agrees that prices and tariffs should be monitored but he states that this is done by the market itself and if not, then there is always the Port Authorities.

When looking at all other European countries they are doing exactly the opposite. Spain has recently also started increasing their concession time, since they realize it is an essential element for the ports to stay competitive. If Portugal remains with a maximum of 30years concessions, then in the long run Portuguese ports will be unable to compete and generate investment nor efficiency, hence, the ports will not be able to attract cargo. (Vasconcelos, 2016) Dra. Lidia Sequeira, new Port Authority President for the Port of Lisbon, also stated her agreement with this line of thinking. (Sequeira, 2016) She and most people in this sector say that longer concessions will also motivate terminal operators to invest more and hence, make the port more efficient.

Eng. Francisco Nascimento (ETE Group), speaking from his own experience as an administrator of various terminals; the company needs to know how many years they can amortize the investment. If equipment cost are large and the concessions years are short, then there will be higher costs per ton moved. This is reflected on the tariffs the terminal operators charge. Terminal operators are reluctant to invest and hence invest in old equipment with old technology and this results in inefficiency. Not only does this apply to the various terminal concessions Group ETE is in charge but also for other terminal operators. This is a clear disadvantage for the Portuguese ports and hinders their development of becoming more efficient and competitive ports. ETE Group is experiencing this themselves; they are concessioners of the Multipurpose Terminal in Sines which is supposed to expire in 2017 (next year), the concession will automatically continue for more 5 years since the power station which uses the terminal will continue its operations in the nearby logistic park; ZILS. Hence, the concession will be extended to 2022. Portsines (ETE Group) has the possibility to buy a new crane. This would cost between 3 to 4million euros, and only have 6 years to amortize this investment. If Portsines would go through with the investment they would have to charge higher tariffs. This is not a profitable solution for Portsines, hence, no investment will be made. (Nascimento, 2016) Other terminal operators face the same dilemmas. On the one hand, port authorities are not happy with this since then the ports do not modernize nor become more efficient, hence, the ports do not become more competitive. But, on the other hand, policies remain unchanged.

Moreover, efficient port infrastructure are also an important means to attract Foreign Direct Investment (FDI). FDI are an advantage for the competitive position of a country. Countries with well-developed financial markets gain significantly from FDI. (Alfaro and others, 2004) By, having short concession periods which demotivates terminal operators to invest in efficient equipment, the government is also causing a discouragement of all sort of FDI and hence, not helping Portugal's competitive position.

Ironically, the government has announced that FDI's are a priority and that they are very open to FDI which will improve the competitive position of the country and also bring employment to the country/region. According to the Banco de Portugal (Bank of Portugal), the flow of FDI to Portugal, was nearly 5.4 billion Euros, net terms, in 2015 (-5.2% in comparison to 2014). (Santander, 2016) A decrease, which can partially be explained by the contradictory policies implemented by the government which are acting as bottlenecks for Portugal's growth. The

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main countries which invest in Portugal are European; the Netherlands and Spain, as can be seen in Figure 13.



Figure 13: Foreign direct investments by origin in 2015. (Santander, 2016)

### Not enough cargo for national shipping lines: Transitex

Transitex is a leading Iberian ocean logistic operator, which recently was bought by the Turkish industrial group Yildirim. Initially Transitex wanted to increase their hinterland from the Alcantra Terminal in the Port of Lisbon (container terminal). They were however also limited by the maximum capacity of the terminal which did not justify Transitex having direct lines to the main global markets. Given the fact that the Port of Lisbon serves the Lisbon region mainly and as mentioned previously the customer base is saturated in Portugal, there was no much room for expansion for Transitex in this specific terminal. So, Transitex opted to enter the Spanish hinterland. In order to reach the Spanish hinterland, Transitex created a department in Spain, with Spanish and Portuguese employers (to overcome language barriers mentioned earlier). This proved to be a smart move; since the company was able to attract cargo from Spain, which left the Portuguese ports. Since 2002, various Transitex offices have opened in Spain. The objective of Transitex is to attract cargo for mainly, the Port of Setúbal, Sines and Lisbon. At a certain point, Transitex managed to captivate 60,000TEU from Seville to the Port of Lisbon. However, the company lost its competitive advantage, partially also to the constant strikes and lack of modernization which effected Spanish clients/cargo. To overcome this, Transitex shifted their focus on the Central American market. Also recently (April 2016), Transitex established direct lines from China to Mozambique. Up till now there was not enough cargo which justified direct lines from e.g. China to Portugal, since most cargo which comes from China is destined to small or medium-sized enterprises, so, large operators would first take all the cargo from China to the Port of Rotterdam or Antwerp and then via short sea shipping it would come to Portugal. Since there was not enough cargo, Transitex found that if

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they would consolidate cargo from Mozambique, Angola, Brazil, then there would be enough cargo which justified stopping at Portuguese ports. Currently, the company also transports a lot of consolidated cargo from South America to Portugal, which the final destination being the Spanish consumer market. (Lima, 2016)

By Transix finding new options to counter the problem of Portugal having a limited consumer market, Portuguese ports are now benefiting from more cargo passing through them to the Spanish hinterland. This clearly has help improve the competitive position of the ports since now they offer regular shipping lines to major trade countries, leading to a wider range of services offered at the ports. A advantage which may aid in the attraction of new customers, since now through Portuguese ports they can now reach large consumer markets.

## Chapter 3 - The Ports of Lisbon, Setúbal and Sines

In the last years port throughout of the range has witnessed growth in containerized cargo (Figure 14), except for some ports (specifically, Port of Lisbon and Port of Aveiro) due to syndicate unrest, this being a problem for the competitiveness of the ports. A study conducted by Santos and Soares (2008), analysed cargo handle in Portuguese ports from 2001 to 2007, concluding that container throughput is increasing significantly in the ports of Leixões and Sines. Whilst container terminals demonstrated to be underused in Lisbon and Sines. However, since this study was conducted, the port of Sines has evolved into a noteworthy transshipment hub for East-West trades. This beginning an example of de-concentration within a port system, a concept mentioned by Notteboom (2010).

When looking at cargo moved by the Port of Lisbon, Setúbal and Sines along the last years, it is clear the Port of Sines is the leader, followed by the Port of Lisbon and Setúbal. Not only is it like this when comparing the three ports but also when comparing the ports to all national ports; Sines being the national leader, followed by the Port of Leixões, then Lisbon and Setúbal, respectively.

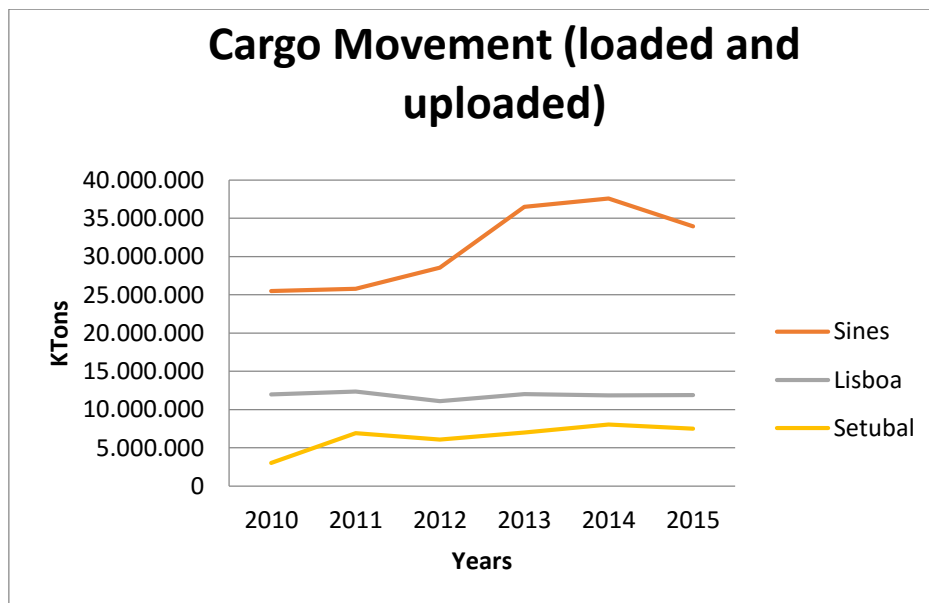


Figure 14: Cargo Movement of the Port of Lisbon, Sines and Setúbal. (Data obtained from IMT, 2016; Port de Sines, 2016; Port of Lisbon, 2016; Port of Setúbal, 2016)

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## Port of Setúbal

The port is located on the crossroads of the major North-South and East-West sea routes. 40km away from Lisbon and 600km away from Madrid. Due to the Arabida Mountains, the Port of Setúbal is sheltered from winds, hence having favorable navigation conditions throughout the year. Vessels are able to enter through -12meter deep access channels into the port.

The port offers multimodal connections. There are both rail and road connections inside the majority of the terminals, and further expansion of railway networks are planned for the future. The Port of Setúbal has various connection opportunities from the hinterland to logistic port platforms. The aim of these platforms is to aid in the transportation of cargo.

The Port of Setúbal, due to its localization and facilities, is focused on Short Sea Shipping, mainly from intra-regional cargo transportation to other European Union countries and the occidental Mediterranean coast. There are weekly line services ; roll-on roll-off, containers and reefers. regular lines (by Grimaldi lines, VW Logistics, NYK, Suardiaz and EML) link the northern European ports and Mediterranean ports, African occidental coast and the Atlantic front of the American continent. The Port of Setúbal is a national leader in the roll-on roll-off sector; approximately 95% of the national market share. Due to its many years collaboration with Volkswagen AutoEuropa factory in the region, other clients also choose the Port of Setúbal. AutoEuropa exports cars to Europe and Asia; bi-weekly departures to China. The AutoEuropa Terminal, situated in the Coelho da Mota Ro-Ro Terminal is the second largest terminal which is directly operated by Volkswagen Europa. The first being in Emden, Germany. (Port Authority Setúbal, 2015).

AutoEuropa Logistics director; Dr. Sandra August states that the factories location is a major advantage. For example, when China opened its borders to foreign cars, there was the possibility for AutoEuropa to easily and quickly export cars via the Port of Setúbal. All other Volkswagen factories are situated more west and then go through Emden. However, due to AutoEuropa's location and the large volume destined to China, AutoEuropa was able to ship directly to China. The Port of Sines was an essential element, they are part an important part of the companies supply chain. (August 2016) given the fact that AutoEuropa only assembles cars, they import all pieces and export the final product. The factory has a direct railway connection from their terminal, which gives them cost competitiveness and is financially viable.

## Cargo Movement

As can be seen by Figure 16, the majority of the merchandise moved in 2015 is breakbulk (orange) which accounts for 39%, and dry bulk(light blue) which also accounts for 39%, followed by container cargo (dark blue) 15%, liquid bulk (yellow) 4% and Roll-on Roll-off (grey) 3%.



How are the Portuguese port's contributing to Portugal's competitiveness?

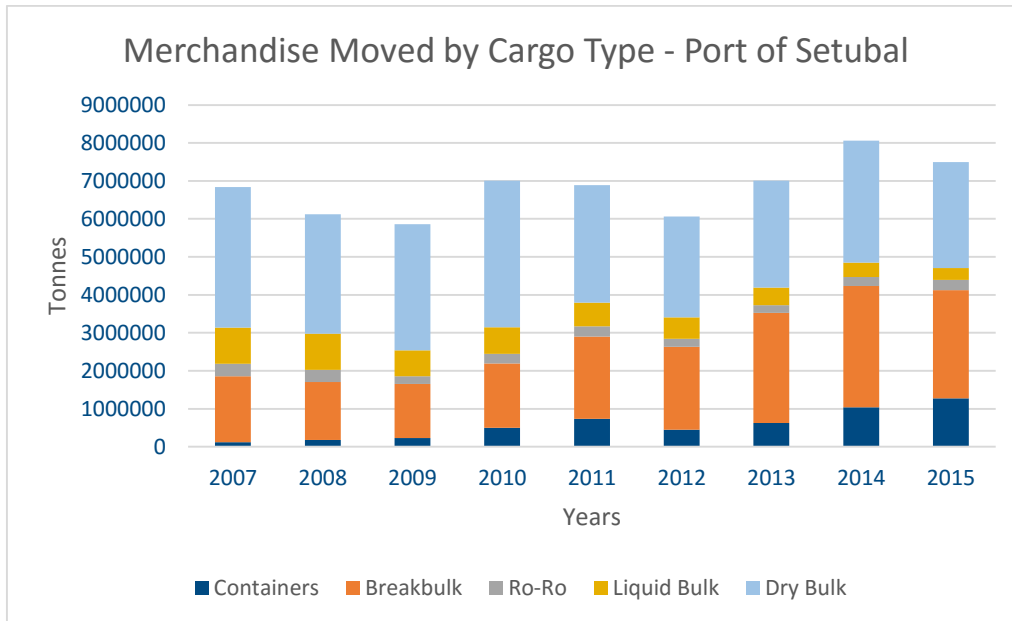


Figure 15: Merchandise moved by cargo type in the Port of Setúbal. (Data obtained from IMT, 2016; Port of Setúbal, 2016)

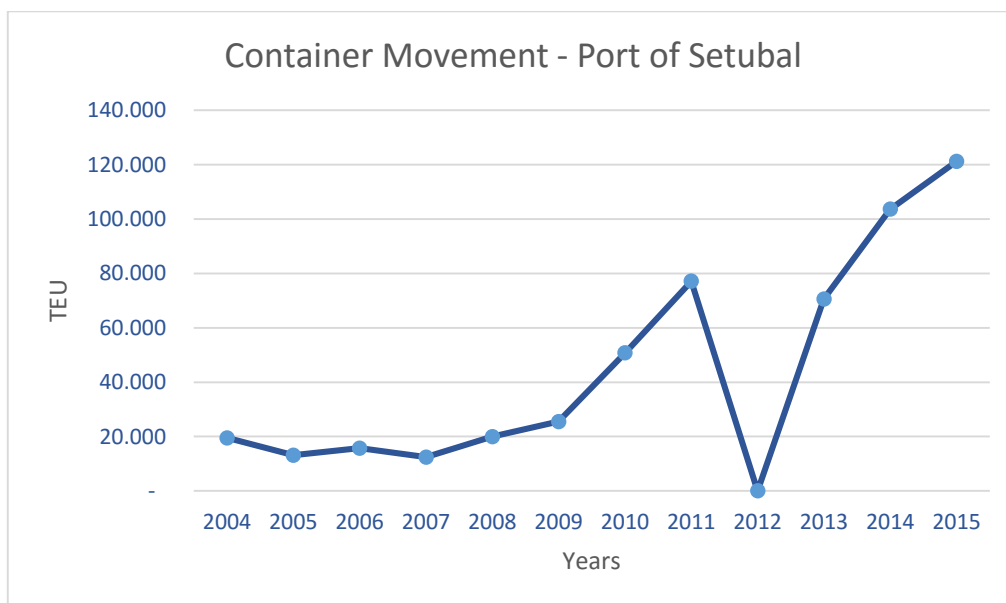


Figure 16: Container Movement at the Port of Setúbal. (Data obtained from IMT, 2016; Port of Setúbal, 2016)

When asking the vice-president of the port authority; Dr. Vitor Caldeirinha, what caused this increase in cargo in the last years he says was due to the economic crisis which caused the internal market to stop, forcing the port to focus on exports. Especially the export of cement, iron and copper. The port implemented this strategy in 2008/2009, but only from 2012 results started to be really seen. Another reason for the growth of the port was the increase in the price of raw material, hence it also being more justifiable and profitable to export. Regarding the growth in container movements, the increase can be explained by the new terminal with more space; 20hectars and dredging which enables large vessels which enter the port of Lisbon to

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also be able to enter the port of Setúbal. In the last three years the container terminal witnessed an increase from 50,000 TEU to 120,000 TEU, and now (2016) is around 150,000 TEU.(Figure 16) (Calderinha, 2016) According to Dr. Calderinha, the terminal did not grow but the container segment grew. And this is reflected in the numbers. The port of Setúbal has space to continue growing in the future.

Initially the container terminal was only used by a local paper factory; Portucel, to export their goods. It was the export of paper which incentivized the container sector of the Port of Setúbal. Other companies then also started to use the Port of Setúbal to import and export goods. Now there is a lot of export to Spain, especially horeca products such as tomatoes. Whilst, import is mainly destined to the Lisbon region, coming from the Mediterranean and the North of Europe. (Calderinha, 2016)

Moreover, Dr. Caldeirinha saw the potential to make the port of Setúbal a Short Sea Shipping port for containers, given the fact that most ports wanted to be a deep sea port, in order to differentiate from other national ports. Also, due to the location and environmental restrictions of the port it made sense to become a short sea port. Dr. Caldeirinha considers that furthermore that the Port of Sines has better conditions to be a deep sea container port than the Port of Setúbal. Whilst, regarding Ro-Ro, the Port of Setúbal is a deep sea port. The port exports to China a lot and imports from Japan, Korea. (Calderinha, 2016)

Due to the improvements implemented by the port authority, the port of Setúbal was able to attract all major shipping lines in the last three years; McAndrews, OPDR, Targus. These shipping lines created the short sea shipping base. Also, Portugal started to import less and then the problem occurred where a lot of logistic trucks would go full one way and come back empty. Causing factories have to pay twice as much, hence, a lot of factories started using short sea shipping as an alternative to pay less. (Calderinha, 2016) However, the port authority knew it was not enough to gain cargo, they also needed to make sure the hinterland accesses were in place. Hence, the port authority encouraged the creation of railway networks to the port. Regular trains to Lisbon also aided in the growth of the port of Setúbal. (Calderinha, 2016)

## How are the Portuguese port's contributing to Portugal's competitiveness?

### Future of the Port of Setúbal



Figure 17: Expansion project of the Port of Setúbal. (Port Authority – P. of S. II, 2016)

Reflecting the increase in demand, the Port of Setúbal has present an investment plan, consisting of three phases. All of the three phases not only consists of expansion but also dredging in due the increase of vessel drafts and the expansion of the Panama Canal. It is necessary for port to be able to accommodate larger vessels in order to stay competitive. Furthermore, the port wants to construct more railways directly to the terminals (Figure 17, pink lines, grey lines representing the current railway network of the port). (Port Authority – P. of S. I, 2016)

Moreover, in May 2015, the port administration announced the expansion of the Coelho da Mota Ro-Ro Terminal (Figure 12 left side, gray area). Implying an investment of €2.9 million, constructions have been concluded in the beginning of 2016. This expansion is part of the priority projects listed by the Portuguese Government in 2014. 5.8hectors are planned to be built in the terminal, in order to improve the import/export of cars and hence, offer more added-value services. Currently running as a second-tier carpark. Moreover, this project reflects the ports aim of becoming a ro-ro hub for intercontinental cross trades between the Atlantic, African and Asian routes to the Mediterranean. Whilst, also aiming to enhance the distribution of cars in Portugal and Spain (up to Madrid), with more specialized logistic activity areas in the port. (Port Authority – P. of S. II, 2016) Furthermore, at the beginning of June the port administration changed, with the Port of Lisbon, Setúbal and Sesimbra being administrated together by Dra. Lidia Sequeira and her board. The impacts that this will have on the Port of Setúbal are still unknown. (Sequeria, 2016)

Another issues which was mentioned by Eng. Ramalho do Nascimento, is the fact that the syndicate in the Port of Setúbal is the same as in the Port of Lisbon. (Nascimento, 2016) Hence, in the future issues with the union could also rise if they are not handled in the meantime.

How are the Portuguese port's contributing to Portugal's competitiveness?

## Port of Lisbon

The Port of Lisbon is located in the capital of Portugal between the River Tagus and the Atlantic Ocean. The port is situated in the vast estuary of the Tagus in a water basin of 32,000ha. It is a natural port, which is sheltered and has deep waters, making it suitable for large vessels (transoceanic).

The estuary of River Tagus has an extension of 50Km and 2Km to 14Km of width, these providing the Port of Lisbon with good navigating conditions. The main access channel of the port has depths of -15,5m. Moreover, a large part of the River Tagus enables the region to be supplied by inland waterways. For some years two companies operate the Portuguese inland waterways, whilst now there is only one; ETE Group. (Nascimento, 2016) Group ETE is a diversified company in the sector of maritime, port operations, inland water transport and logistics (third party logistics). Regarding, the companies inland waterway service along the River Tagus; the main cargo transported are containers, dry and liquid bulk. Often cargo is uploaded/unloaded directly to factories, such as is the case with Cimpor, who transports it's cement and clinker along the river to the Port of Lisbon to be then distributed to the rest of the world. Annually 700,000 tons of cargo are moved. (Nascimento, 2016) This is a sustainable and fast mode of transport for factories located along the river.

The port is strong in the agro-food business and the cruise sector. The agrifood bulk segment comes mainly from America and is redistributed to the Iberian and European markets. Moreover, the port is geared for handling containerized cargo; containerized cargo represents around 45% of all cargo handled in the Port of Lisbon. An annual handling capacity of around 1 million TEU due to the ports location in the country's main consumption center (Lisbon and Tagus Valley). Regarding general cargo, the port handles mainly packed cement, clinker, sugar, rice, wheat and fuel slops. Liquid bulk mainly consisting of oil, chemical products and food oils. (Port Authority – P. of L. II, 2016)

Furthermore, the Port of Lisbon, like most ports now-a-days, is connect to the national and international transport network. Moreover, the port has an internal road system which serves the different terminals and other facilities. Also, a railway network is connected to the port, with the south bank serving a number of fast routes which facilitates the access of goods from the rest of the country and Spain. (Port Authority – P. of L., 2016)

## How are the Portuguese port's contributing to Portugal's competitiveness?

### Cargo Movement

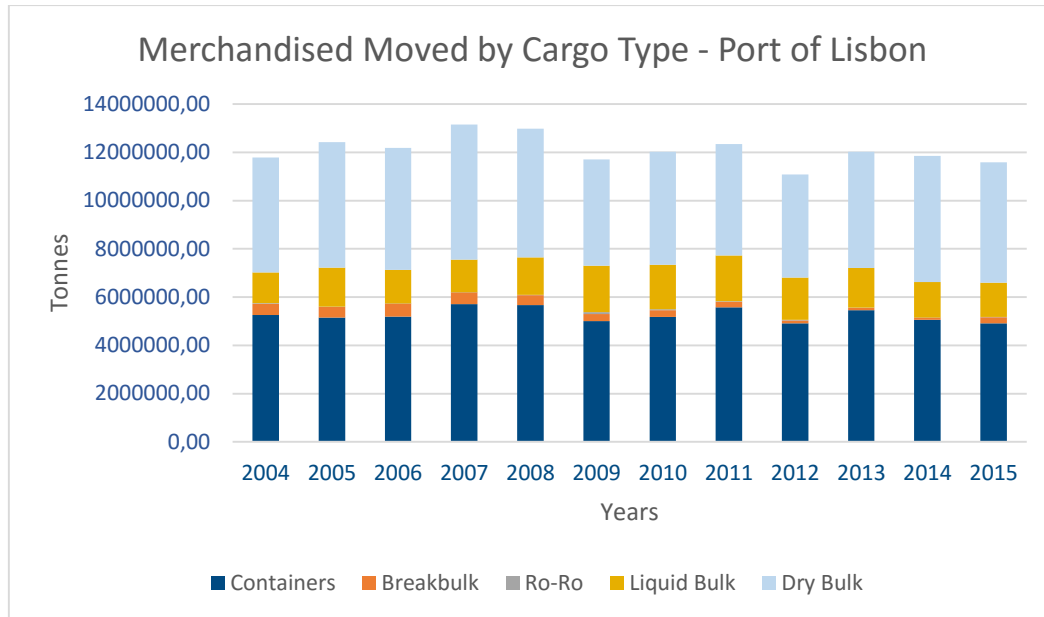


Figure 18: Merchandise moved by cargo type in the Port of Lisbon. (Data obtained from IMT, 2016; Port of Lisbon, 2016)

As can be seen by Figure 18 there has been a decrease in merchandise moved in the Port of Lisbon due to when the recession hit Portugal (starting 2008-2009) and due to the issues with the port union which also caused the port to stop operating quiet often in the last years.

Moreover, the cargo with the port operates the most with is containerized cargo (import; milk, chemical products, fish. Export; marble, prepared or preserved tomatoes, paper); the Port of Lisbon is one of the national leaders in this sector, followed by dry bulk cargo (import; corn, soya. Export; cement, sand for industrial means), liquid bulk, and breakbulk. (Porto de Lisbon, 2016)

The majority of the cargo which is unloaded in the Port of Lisbon comes from Spain (17,4%), Brazil (12,3%), UK (10,4), Ukraine (10,2%) amongst other European and non-European countries. Whilst, the cargo which is uploaded is destined to the Angolan market (15,2%), China (10,1%) and Colombia (7,8%), amongst other countries.

Regarding container movement (Figure 19), the Port of Lisbon has seen a drastic decrease in 2015 compared to any other year (480,000 TEU). The disagreements with the union started in 2012, where the strikes also caused a decrease from around 540,000 TEU to a bit over 480,000 TEU. In 2016, strikes continued, the last one occurring in May/June which lasted 40 days can lead to a loss of 100,000 euros per day to the Port of Lisbon. (Agência Lusa, 2016) Cargo moved in May fell 47,5% compared to May 2015. (Jornal Expresso, 2016)

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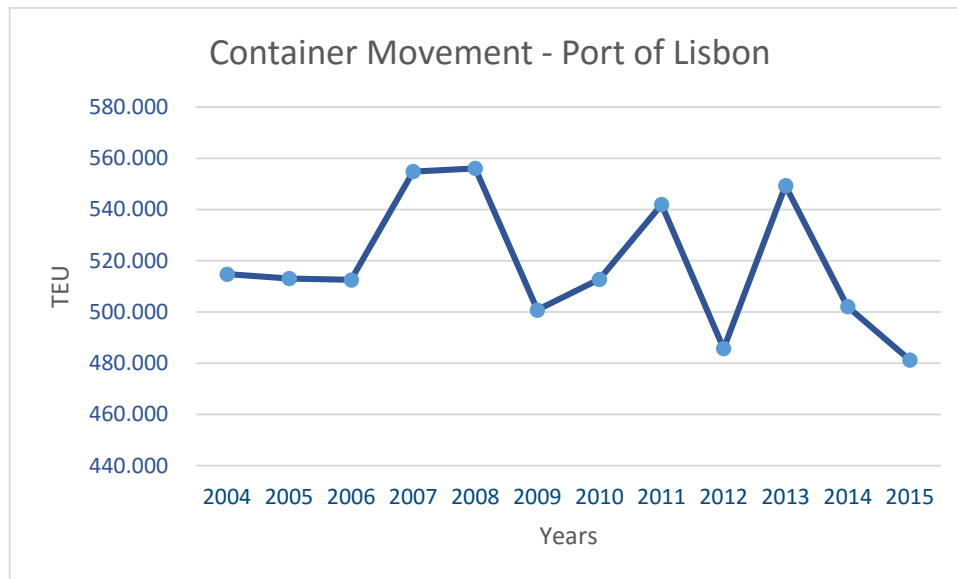


Figure 19: Container movement of the Port of Lisbon. (Data obtained from IMT, 2016; Port of Lisboa, 2016)

#### Future of the Port of Lisbon

The future of the Port of Lisbon is to a certain extent uncertain, especially due to its limited space of expansion and the union problems the port has experienced for decades.

In the past the limited space has caused the port of Lisbon to gradually expand to the Port of Setúbal and the Port of Sines, like petrochemicals. Hence, the functions which were previously done in the Port of Lisbon changed to the Port of Setúbal and Sines. (Caldeirinha, 2016) This shift was also due to the construction of the EXPO, which forced all terminals related to petrochemicals having to move. Moreover, no expansion projects are mentioned on the Port Authority website for the near future.

This could however change with the alteration in Port Administration in June 2016, where not only will the Port Administration of the Port of Lisbon, Setúbal and Sesimbra become one but also the board has changed. There is a lot of hope on Dra. Lidia Sequeira, who assumed the new leadership of the port with a new administration team. Dra. Sequeira was the president of the Port of Sines and has contributed a lot to the development of the port in the years she was president. Hence, there are high hopes that the Port of Lisbon also grows/improves its current situation.

Moreover, the Port of Lisbon should invest in improving the efficiency of their operations. The director of Cerialis (a leading national cereal company); Dr. João Amorim, states that his company uses the terminal of Beato to receive raw goods. However, the Beato Terminal is limited to -8m, hence the company faces constraints regarding vessel sizes. For this company specifically improvements in operational efficiency would be essential. Also, the price of raw materials is volatile, hence, the company needs to optimize their logistic supply chain as much as possible. The more uncertainty there is regarding their shipment, due to vessels being late since they are in the waiting queue, the more freights the company ends up paying to its suppliers. For every euro per ton is equivalent to 400,000 euros of extra costs on the company's import.

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This causing not only the production to be late but also causes an increase in price of the final product. (Amorim, 2016) This making it justifiable for the port to invest in dredging.

Regarding the problems with the syndicate, the last strike was considered by many as being the tip of the iceberg. As clearly stated by Dr. Vasconcelos, board president of MADLOG and vice-president of the national shipping agents association; ports cannot let themselves be run by a small minority group which puts their egoistic needs in front of the general interest. It is not correct that the syndicate puts thousands of jobs, firms and even the port at risk. If the port authorities do not handle this issue once and for all seriously, then nothing will change. As has been seen the syndicate is able continuously to stop the economic activity for the last 10 years. The syndicate should be limited in regard to their power. If this is not managed properly then Dr. Carlos Vasconcelos sees the future of the Port of Lisbon very skeptically. (Vasconcelos, 2016) The wave of strikes has affected the port's image negatively, causing shipping lines to be reluctant to return to the Port of Lisbon. An agreement (paz social (social peace)) was made for the following six years, however, it was 'forced' by the Prime Minister; Antonio Costa, which in Parliament started that by the end of the day an agreement had to occur. (Nascimento, 2016) Hence, a number of people are skeptical regarding this forced agreement. Especially, due to previous experience. The Port of Aveiro faced similar problems with its syndicate until the port was forced to close completely. Similarly, the syndicate from the Port of Lisbon wanted higher wages and more employment. In the agreement it is stipulated that 70 more people will be employed in the port. However, this does not make sense given the fact that the Port of Lisbon is losing cargo. In the long run, if the Port of Lisbon does not recover quickly, there will be no money to pay salaries and again problems with the syndicate will occur. (Nascimento, 2016) Moreover, investors are reluctant to invest since investors want a long term stability which the port of Lisbon does not seem to offer at the moment. An example of the consequences of the constant strikes is the shipping Maersk, who has opted to stop using the port of Lisbon. (Cardoso, 2016)

How are the Portuguese port's contributing to Portugal's competitiveness?

## Port of Sines

The Port of Sines is the most important port in the country, with a share of 46% of the total of cargo handled in the country. It is also the leading container port in the country. The main products handled are liquid bulks, containers and dry bulk. It is a deep water sea port with good maritime access and with no urban restrictions, hence, assuring a long-term expansion capacity. The Port is located Southeast of Lisbon, on the crossing of the main maritime routes; East-West and North-South. This privileged location and the port natural characteristics enable it to become a hub port for the Ibero-Atlantic front. (Port Authority – P. of Sines, 2016) The Port of Sines is the first European port for vessels coming from the Panama Canal, whilst if vessel come from the Suarez Canal then the Port of Sines is also in a strategic location to further reach the North of Europe. (Cardoso, 2016)

Besides this, the Port of Sines is the main national energetic supplier (coal, crude and natural gas). In the Portsines multipurpose terminal, a factory is located, operated by ETE Group, which imports coal, treats it and then re-exports it to nearby countries (near-shoring). (Nascimento, 2016) There are a number of near-shoring/re-shoring examples in the surrounding of the Port of Sines. Repsol imports liquid bulk and transforms it into a final product (mostly plastics, PET), and exports it via the container terminal. Also, in the nearby refinery, crude oil is imported and gasoline and diesel is exported to France and America, for example. (Soares, 2016)

Moreover, with regards to container cargo and coal, the Port of Sines is the port with the highest train frequency in the whole of the Iberian Peninsula. (Vasconcelos, 2016) Coal is transported to the nearby power stations regularly. (Port Authority – P. of Sines I, 2016)



Figure 20: The Port of Sines hinterland links and regular connections. (Port Authority – P. of Sines II, 2016)



How are the Portuguese port's contributing to Portugal's competitiveness?

Due to its substantial growth in the last years, the Port of Sines has become the 4<sup>th</sup> Iberian container port (1,33million TEU), nearly the same as the Port of Barcelona (1,9million TEU), and is now ranked 17<sup>th</sup> in the European container movement ranking.

Currently the port's main hinterland is the south and midland region of Portugal, whilst, in the past years the port has gained a competitive position in the Spanish Extremadura and hopes to reach the Madrid region through Badajoz. (Figure 20)

#### Cargo Movement

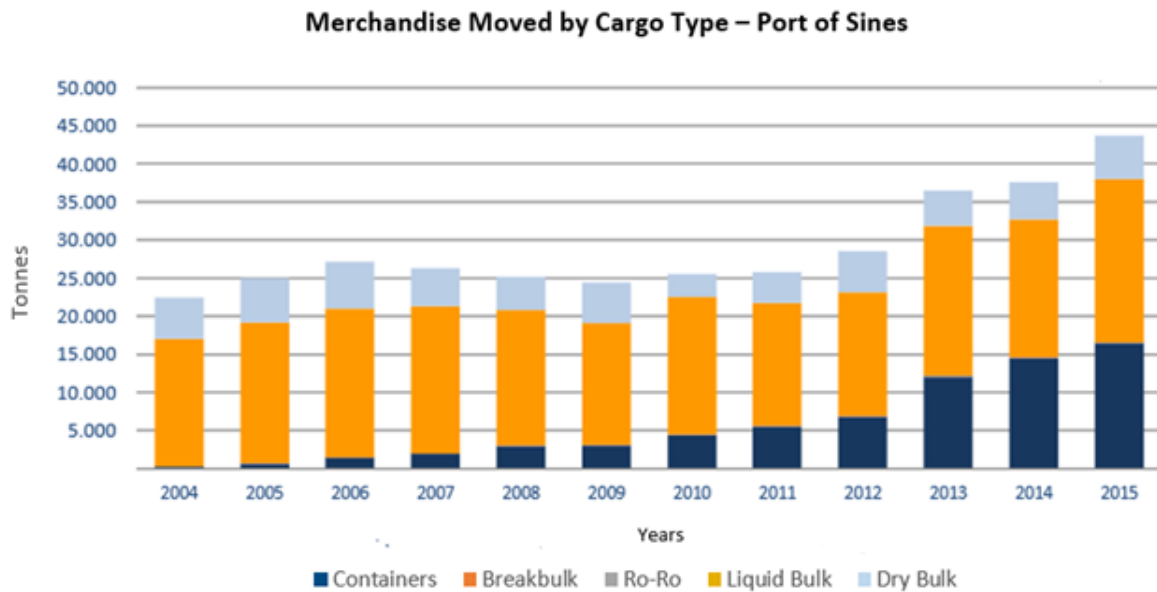


Figure 21: Merchandise moved by cargo type of the Port of Sines. (Data obtained from IMT, 2016; Port of Sines, 2016)

The Port of Sines has been growing tremendously in the past years in all segments (Figure 21 and 23). In 2015, cargo movement was nearly 44 million tones (43.966Kton), an increase of 17% compared to 2014. Dr. Jose Pedro Soares says that the growth of the port is due to the evolution of the port itself along the years. (Soares, 2016)

Dedicated terminals have demonstrated a large growth. Dry bulk has had the largest increase of 19,5%; liquid bulk has increased by 19,1% and general cargo by 13,5% in 2015. Containerized cargo increased by 13,7%, to nearly 16,5 million tons being moved. (Port Authority – P. of Sines III, 2016)

A substantial increase in liquid and dry bulk and breakbulk is largely due to the increase in the export of gasoline, diesel, proline, natural gas, washed coal, granulated wood and ethylene destined majority to Spain, United States of America, France, Gibraltar, Holland, Morocco and Brazil. Whilst, containerized cargo consists mainly of the export of marble, chemical products base, paper, vegetables and fruits, wine and plastics destined to the United States of America, Canada, Spain, South Africa, Angola, Brazil and United Arab Emirates. (Port Authority – P. of Sines III, 2016)

How are the Portuguese port's contributing to Portugal's competitiveness?

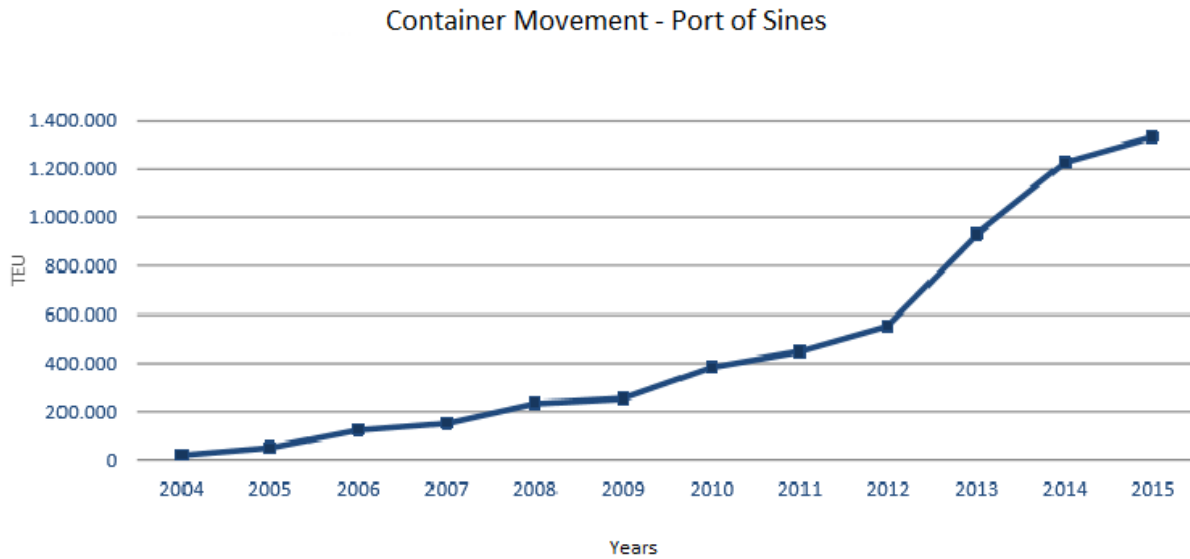


Figure 22: Container movement of the Port of Sines. (Data obtained from IMT, 2016; Port of Sines, 2016)

Terminal XXI (container terminal) grew by 8,5% in 2015, reaching a record of 1,332,200 TEU. This terminal moves around 37,4% of the cargo volume of the whole port and hence, also being the main user of the ports railway network to the ports hinterland. Specifically, reefers containers increased in 2015. This also being due to the opening of the Spanish logistic operator; Friopuerto, operating cool storage of fruit and vegetables destined to the Portuguese and Spanish market. (Port Authority – P. of Sines III, 2016)

According to Dr. Jose Pedro Soares (executive member of the board of the Port of Sines), there are a number of reasons which has caused the Port of Sines to grow so drastically in the last years. One of them being the location of the port and the port being a natural deep sea port, which enables all type/sizes of vessels to come to the Port. Moreover, the seabed is rocky and hence, any dredging investments needs to be done only once. The Port is able to have low costs in the medium and long term, only in the short term costs are high. Another reason for the growth is that the Port of Setúbal is still a young port, so equipped with the newest technology and infrastructure. The Port Authority is also composed of young people which have a new/modern mentality, and who know that their future depends on the port. Hence, there being a win-win situation which leads to higher productivity levels. Another reason behind the growth of the Port is that the Port operates throughout the whole year and day, whilst offering a flat rate. Meaning there is no price discrimination based on the time of arrival of the vessel. Whilst, in other Ports, if the vessel arrives during the night then it is charged with an extra rate. On the weekends this flat rate also applies. This gives the shipping lines an insurance that no matter what time or day he arrives at the port, he will always have a fixed cost. Nor do they need to worry if the vessels is running late or re-calculate all their costs since they arrived during the night. (Soares, 2016) Finally, another factor for growth was the ports railway connections to the hinterland. Through the Port of Sines more than 5,000 trains per year run. Road accounts for only 3% of the ports hinterland accesses, whilst 97% of the cargo is transport via rail. (Soares, 2016)

The first quarter of 2016, has already demonstrated growth, when compared to the first quarter of 2015. Containers have increased by 10,5%, liquid bulk by 1,7%, dry bulk by 29,4% and

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general cargo by 25,2%. This demonstrating that 2016 is also a promising year for the Port of Sines. (Newsletter Port of Sines, 2016)

#### Future of the Port of Sines

Sines in the past years has shown to be a port of success. It has demonstrated it can be competitive and attract more and more cargo, to and from Spain especially. (Vasconcelos, 2016) There are plans for expansion of the container terminal (Terminal XXI); increase the quay length to 1146m (currently 946m) and increase handling capacity to 2,100,000 TEU.

A very important aspect, which distinguishes the Port of Sines from the other two ports mentioned is that there are no syndicate problems since the union is happy with their working conditions and salaries. This is due to the fact that the Port of Sines has demand and production in the region. (Soares, 2016) this has also to do with the young workforce, as mentioned earlier, working at the port.

The Port administration believes that the port will continue to grow, however, they think that their needs to be a strong focus on the national productive sector since it is an important cumbersome for ports, given the fact that ports do not product their own goods but just transit goods. If there is an increase in hinterland and production then ports can continue to have a positive growth. (Soares, 2016) Moreover, with the construction of the railway line between Evora and Badajoz, 135Km are saved. This will increase the potential of the port and make the port more competitive.

Another important issue for the Port of Sines is that the Port needs to continue bidding on accessibility and improve their hinterland in order to show to national and international investors that the Port of Sines is the gateway to enter other markets (e.g. Spain, North Europe, Africa). The port of Sines has the potential to become the Atlantic Gateway of the Iberian Peninsula, as can be seen by its steady steps in transshipment.

Companies benefit from the proximity to the container terminal (Terminal XXI) and TMS – Multipurpose Terminal. Recently, a large Spanish investment was made by Fripuerto, which according to Dr. Jose Soares demonstrates the bid made by the port on reaching the Spanish hinterland. This is a considered a key moment for the port, where a Spanish company opted to located itself in the Port of Sines to supply majority the Spanish hinterland. (Soares, 2016) This is of strategic importance for the Port of Sines but also for other Portuguese ports since if Spanish investors see the investment made by Fripuerto to succeed then there is a higher probability that they also start to consider investing in other Portuguese ports. In the long run this would clearly lead to an improvement of the Portuguese ports competitiveness as new technology would also be introduced with these investments and hence, make the ports more efficient.

According to João Gaitas, Fripuerto Portugal manager, Fripuerto decided to install themselves in the Port of Sines due to the increase in fruit import from South America and Africa witnessed through the Port of Sines destined to Portugal and Spain. In the case of fruit, time and quality are an essential in the logistic supply chain. Fruitpuerto observed that MSC (Mediterranean Shipping Company), has direct lines to Sines coming from South America and Africa with transit times which are getting shorted and shorted. Moreover, up till now there was no similar company situated in ZALSINES, hence, Fripuerto decided to fill in this gap and take

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advantage of the growth trend the Port of Sines in demonstrating by investing 2,5million euros in this unit. (Newsletter Port of Sines, 2016)

According to Dra. Isabel Cardoso, business manager of Aicep Global Parques, companies who install themselves in Sines, come with the idea to enter the European market or the Portuguese speaking countries. It would be very beneficial for the park if a large firm would install themselves in ZILS, such as IKEA or Declaton, which move large amounts of cargo. Dra. Isabel Cardoso believes that if one large firm would come then others would follow. Aicep Global Parques is currently working on this plan in collaboration with the port authority and container terminal operator. (Cardoso, 2016)

### Lisbon – Setúbal – Sines; competition or complement?

When asked if these three ports are competitors, everyone from the Portuguese maritime sector provided the same answer; the ports are complementary. Dr. Calderinha sees the Port of Lisbon, Sines and Setúbal as being one large port for the Lisbon region, each with their own specialization and characteristics, which expand due to the space limitation of the Port of Lisbon. (Calderinha, 2016) Dr. Jose Soares, adds moreover that the container market is very large. The Port of Lisbon, is mainly focused on the Lisbon region, whilst, the Port of Setúbal has other players which also serve the larger region of Lisbon but also the local industry (paper factory and AutoEuropa). Whereas, the Port of Sines due to its typology is focused on transshipment. (Soares, 2016) (Nascimento, 2016)

Despite these ports being complementary, they do have the same trades, such as containers. Especially, the Port of Lisbon and Setúbal both supply the Lisbon region. However, as mentioned previously, given the fact that the Port of Sines and Setúbal are to a certain extent an expansion of the Port of Lisbon, which due to its space limitation was forced to expand to other ports part of its functions. Hence, despite serving the same region and having the same trades they simply complement each other. and do not steal customers from each other. AS stated by the Port Authority of Sines, there exists a health completion between the ports, where the ports do not steal customers from each other. The Port Authorities work together in order to gain more international recognition. (Soares, 2016)

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## Chapter 4 – SWOT Analysis

SWOT (strength, weaknesses, opportunities and threats) analysis is an analytical framework useful to identify internal (strength and weakness) and external (opportunities and threats) factors which possibly have an impact on the sustainability of the company or in this case of a port and its services/products. Furthermore it helps understand the weakness of the port and how they can be managed in order to become successful. SWOT analysis allows companies to match their resources to the industry's competitive environment. (Rouse, 2014) SWOT analysis looks at four elements;

- **Strengths:** internal features and resources which help the port achieve success.
- **Weaknesses:** internal features and resources which hinder the port.
- **Opportunities:** External features which the port can use as an advantage to become successful.
- **Threats:** external features which could endanger the port's success.

(Rouse, 2014)

Once a SWOT analysis has been completed, the port can identify and decide if it is worth pursuing a certain goal and what is necessary to alter in order to make the port more efficient and competitive. Chapter two and three both serve as a bases for the SWOT analysis for the Port of Lisbon, Setúbal and Sines. Moreover, the SWOT analysis will aid in answering the research question clearly and soundly. Below a SWOT analysis is presented for each port and a final SWOT analysis for issues which all Portuguese ports face, keeping in mind the three ports that this thesis focuses on.

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### SWOT Analysis Port of Setúbal

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Located near Lisbon (40Km).</li> <li>• Location; sheltered from winds = favourable navigation conditions.</li> <li>• Direct railway connections to most terminals.</li> <li>• Railway expansion to more terminals.</li> <li>• Differentiate – Short Sea Shipping focus.</li> <li>• National leader in Roll-on Roll-off.</li> <li>• Environmental awareness/taken into account.</li> <li>• Collaboration with knowledge institutes.</li> </ul>	<ul style="list-style-type: none"> <li>• Possible syndicate unrest.</li> <li>• AutoEuropa/VW focused.</li> <li>• New port administration; 3 ports administrated together.</li> <li>• 4<sup>th</sup> ranked port of Portugal.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• AutoEuropa: assemble new car in 2017.</li> <li>• Increase in container movement.</li> <li>• Creation of SSH base for shipping lines.</li> <li>• Three phase expansion plan.</li> <li>• Become a Ro-RO hub.</li> <li>• New port administration.</li> <li>• Expansion investment.</li> <li>• Attract multinational firms to nearby logistic parks.</li> <li>• Development of logistic parks.</li> </ul>	<ul style="list-style-type: none"> <li>• Port of Barcelona; major Spanish SSH port.</li> <li>• VW scandal – decrease in sales.</li> <li>• Ro-Ro increase in other Portuguese ports; Port of Leixões.</li> </ul>

Figure 23: SWOT analysis of the Port of Setúbal.

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## SWOT Analysis Port of Lisbon

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Location: capital (country's main consumption region), Tagus river (inland waterways).</li> <li>• Above Iberian Peninsula average in bulk cargo.</li> <li>• Serve production area north of River Tagus.</li> </ul>	<ul style="list-style-type: none"> <li>• Strikes = decrease in cargo.</li> <li>• Syndicate issues for the last 10years.</li> <li>• Very limited expansion space.</li> <li>• No future investment plans.</li> <li>• No logistic parks in the proximate port region.</li> <li>• Not investing in efficiency improvements.</li> <li>• Beato Terminal limited to -8m deep waters = limits vessel size.</li> <li>• Shipment uncertainty = causes producers to have to increase the prices of their final products.</li> <li>• No logistic parks in the port surrounding.</li> <li>• Investors reluctant to invest.</li> <li>• No specific focus.</li> <li>• No connection between the port and the city.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• New Port administration.</li> <li>• Invest in dredging = larger vessels could come.</li> <li>• Serves local industry and the region of Lisbon.</li> <li>• Transitex's success.</li> </ul>	<ul style="list-style-type: none"> <li>• Syndicate issues if then continue.</li> <li>• Investors reluctant to invest.</li> <li>• Future of the port is seen as sceptical.</li> <li>• If hire more workers, as agreed, and cargo volumes keep decreasing = no money to pay salaries.</li> <li>• Shipping lines opt for other ports.</li> </ul>

Figure 24: SWOT analysis of the Port of Lisbon.

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### SWOT Analysis Port of Sines

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Leading port in Portugal.</li> <li>• Natural deep water port.</li> <li>• Rocky seabed. Only do dredging once = investments done once.</li> <li>• Young port; modern technology and young\motivated workforce.</li> <li>• No syndicate problems.</li> <li>• Main national energetic supplier = important for national economy.</li> <li>• Highest train frequency in the Iberian Peninsula.</li> <li>• Flat rate.</li> <li>• Focuses on transshipment.</li> <li>• ZALSINES and ZILS.</li> <li>• Collaboration with logistic parks.</li> <li>• Invest in human talent.</li> </ul>	<ul style="list-style-type: none"> <li>• Young port; unexperienced.</li> <li>• Success depends on container carriers.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Further expansion. Have the space.</li> <li>• Friopuerto's investment.</li> <li>• Railway expansion from Evora to Badajoz = + efficiency.</li> <li>• Become a transshipment hub.</li> <li>• Industrial ecosystems. E.g. the petrochemical firms.</li> <li>• Attract multinational firms to nearby logistic parks.</li> </ul>	<ul style="list-style-type: none"> <li>• Syndicate unrest, undermining current labour advantages.</li> <li>• General decrease in container volume.</li> <li>• Close by Spanish competitor; Port of Algeciras.</li> <li>• New container investment planned in Tanger (APM Terminals).</li> </ul>

Figure 25: SWOT analysis of the Port of Sines.



## SWOT Analysis for all three ports

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• JUP (Port Single Window) – less bureaucracy.</li> <li>• Fatura Unica (One Bill).</li> <li>• Location.</li> <li>• Multi-gateway region.</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure - terminal operators reluctant to invest.</li> <li>• Quality of infrastructure needs improvement.</li> <li>• Inefficient terminals.</li> <li>• Serve overlapping hinterland.</li> <li>• Saturated market.</li> <li>• Fulfil national consumer base.</li> <li>• Spanish customers loyal to Spanish ports.</li> <li>• Short concession periods.</li> <li>• Bad image due to the Port of Lisbon problems.</li> <li>• Limited financial means.</li> <li>• Little R&amp;D.</li> <li>• Innovation not stimulated.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Reach the Spanish hinterland, especially Madrid region.</li> <li>• JUL (Logistic Single Window) = + efficiency.</li> <li>• Facilitate clearance of goods to/from dry ports.</li> <li>• Agreement with Badajoz dry port.</li> <li>• Expansion of the Panama Canal – Portuguese the first EU ports.</li> <li>• Use Portuguese ports to enter EU or Portuguese speaking countries.</li> <li>• Collaboration amongst ports to promote the Portuguese ports as one.</li> <li>• Favorable agreements with ports from Portuguese speaking countries (e.g. Brazil, Angola etc.)</li> <li>• Become global ports.</li> <li>• Modernization.</li> <li>• Cooperation with logistic hubs.</li> </ul>	<ul style="list-style-type: none"> <li>• European economic development – dependent on it.</li> <li>• Customer base is saturated.</li> <li>• National productive sector.</li> <li>• Spanish ports; becoming more efficient, competitive.</li> <li>• Evora - Badajoz railway line expected to be competed only in 2020.</li> <li>• Lower working salaries in eastern countries – production move.</li> <li>• Political instability = often change policies.</li> <li>• Short concession periods – terminal operators do not invest in modernization – inefficient ports.</li> <li>• Long time until decide to invest in modernization.</li> <li>• Shipping lines use larger vessels and call fewer ports.</li> </ul>

Figure 26: SWOT analysis of all three ports.

When looking at these SWOT analyses we can conclude that current and future situation of the Port of Lisbon does not seem very promising. A drastic change needs to take place in order for the port to become competitive and attract cargo again. The port of Lisbon seems to result in a very limited contribution to Portugal's competitiveness. Obviously, the port of Lisbon, with the many strikes has not been acting as an engine for economic growth. The syndicate has been

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able to stop the national economy several times in the last 10years. A substantial bottleneck, which is also bringing with it a negative image to Portugal and its ports.

A completely contrary conclusion can be reached after analysing the Port of Setúbal and especially, the Port of Sines. The port of Sines can be seen as a remarkable port which despite being still a young port is the national leading port. It is a very promising port which has demonstrated to contributing to Portugal competitiveness and help strength the business climate (e.g. the Spanish investment made by Friopuerto, which is of strategic importance to enter the Spanish hinterland). Similarly, the Port of Setúbal is contributing positively to Portugal's economic growth with the various companies located in the port's surrounding (e.g. AutoEuropa).

In sum, in relation to the research question; How are the Portuguese port's contributing to Portugal's competitiveness?, the Port of Sines and Setúbal are contributing to Portugal competitiveness by strengthening the business climate, whilst, the Port of Lisbon, at the moment, is not contributing to Portugal's competitiveness and rather acting as a bottleneck.

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## Chapter 5 – Conclusion

In conclusion, these three Portuguese ports are demonstrating growth and dedication to further develop their functions and competitive advantage. When looking at the research question; how are the Portuguese port's contribution to Portugal's competitiveness?, the answer is a lot. From the three ports analyzed, it is clear that they are trying to solve their issues (e.g. syndicate problems) and gain more cargo, whilst, trying to gain more hinterland. This is clearly seen by the port's engagement with the dry Port of Badajoz. Moreover, the ports realize that they are a vital logistic infrastructure since they transport cargo (import and export), this being of essence for the Portuguese economy.

The following sub-questions were also answered through the paper;

- *Are improvements in the hinterland network, infrastructure improvements, economic recovery reason for growth?*

Hinterland network improvements, infrastructure improvements and economic recovery are partially reasons for growth. This is noticeably seen in the Port of Sines, with terminal improvements (Terminal XXI, container terminal) have attracted known shipping lines, this came to the attention of Friopuerto (Spanish company). In combination with the planned railway expansion (Evora - Badajoz), Friopuerto decided to open a cold-store facility to take advantage of these factors to supply the Portuguese and, primarily, the Spanish market. The decision to enter the Portuguese market being due to the increase in purchasing power which Portugal slowly is witnessing. A similar situation is seen with AutoEuropa in Setúbal.

- *Which hinterland area do the Portuguese ports serve?*

The Port of Lisbon and Setúbal have a national focus, both serving mainly the larger Lisbon region and north of the River Tagus. Whereas, the Port of Sines focuses on transshipment. All three ports do serve the Spanish hinterland and want to go further into Spain, in the long run hoping to reach the Madrid region. The Spanish hinterland is the furthest that the Portuguese ports can reach due to Portugal geographical location.

- *How is the hinterland served (truck, intermodal)?*

The hinterland is served mainly by an intermodal form of transport (rail and truck). Most terminals in all ports have direct railway connections to hinterland destinations. Moreover, the usage of rail is substantially larger than the usage of other means of cargo transport to and from Portuguese ports.

- *Why is throughput increasing in the last years?*

The throughput increase in the last years in the Port of Sines and Setúbal can be explained by modernization and expansion of terminals. This enabling larger cargo volumes to pass through the Portuguese ports, which before was not possible.

- *From which countries do containers originate and what are destinations?*

A large share of containers originates from South and North America and Africa. With the main reach the north of Europe (through SSH, transshipment) and Spain.

- *Who are the customers? Are they destined for the national or international (Spanish) market?*

For the Portuguese ports, the main customers are the north of Europe (especially for the Port of Setúbal and Sines) and Spain. Portugal is very dependent on the economic development of

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Spain, since a very large share of goods which pass through the ports originates from or is destined to reach Spain.

- *Can the Portuguese ports help the Portuguese economy and how?*

Portuguese ports can clearly help the national economy. If the Port of Sines continues on the path that it is on now, then the port seems to have a bright future which in the long run will attract more companies to install their logistic facilities near the port as means to serve/enter Spain. Furthermore, the port is still new and has a lot of expansion area. With the new railway line directly to Badajoz, the port will gain another competitive advantage, from which they can only benefit from. The Port of Setúbal, is demonstrating its economic impact on the surrounding region. This is seen by the by AutoEuropa for example, which has an economic influence on the region. If the Port of Setúbal was not in proximity of the assembling line then it is less likely that AutoEuropa would be located there. (Augusto, 2016) This being in line with Bottasso and others(2014) and Van den Bosch (2011) study regarding the positive economic impact ports can have on the local economy. Whereas, the Port of Lisbon will continue to face some difficulties in the short run until operators and shipping lines are reassured about the port and decide to come back. Regarding, the Port of Setúbal is will continue to be a national focused port. Yet if short sea shipping is to increase in the coming years then the port can obviously develop strongly in this sense. This does however depend also on the economic development of Europe, especially the north of Europe.

However, if the ports do not become more efficient then despite them having excellent locations, they will not be able to attract more cargo nor vessels. This mainly referring to the Port of Setúbal and Lisbon. It is already a great step that the ports have the notion that national market is limited due to Portugal size and that the only solution, in order for the ports to keep growing, is to captivate the Spanish market and invest in short sea shipping and transshipment.

Portuguese ports are becoming more competitive by trying to solve bottlenecks, such as unfinished railway connections, language barriers which hinder the access to a larger hinterland. The maximum hinterland range Portuguese ports can reach following Notteboom concept, is the Madrid region since it is in the 600Km radius of the ports. With the aid of the dry Port of Badajoz the ports are taking a step into reaching Madrid. This will of course take many years since first consumer trust and awareness of the Portuguese ports advantages (e.g. faster route to many countries) needs to be gained but it is a beginning. Zhang, (2008) states that hinterland access conditions also have an impact on port competition. The fact that Portuguese ports are realizing this and improving the access infrastructure demonstrates that access influences port competition.

In order to improve the competitiveness of the Portuguese ports there needs to make investments within the logistic lines in Portugal and also to Spain. Also, Portugal takes a long time to actually invest in new terminals, hence, losing precious time. Whereas, their neighbor; Spain, this is a fast process once the government sees the potential. Another, concern, which was also mentioned by Dr. Jose Soares, is the natural grows of ports which is becoming more and more fierce. There are a lot of ports and the market is reaching its degree of maturity. In order to overcome this, ports need to start focusing more on areas where there is growth.

This study has of course some limitations such as more interviews could have been conducted with different organs (e.g. Sea Minister). But, the main limitation is the fact that some organ

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did not answer to interview requests or showed interest but then canceled last minute. This limits to some extent the range of information and hence, also the range of opinion/data quality.

In the future, this study could be further developed by conducting a case study on all four major Portuguese ports (Sines, Leixões, Lisbon and Setúbal) or all Portuguese ports, this would enable a more in-depth perspective of the competitive position of the Portuguese ports. Also, it would enable us to see how the Norther ports deal with hinterland connections. Likewise, spending some weeks at each of the ports would be interesting. This way a clear insight would be gained of each ports and information would not solemnly be based on interviews but also on firsthand experience.

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How are the Portuguese port's contributing to Portugal's competitiveness?

# Appendix

## Appendix 1 – Port of Setúbal Terminals

The Port of Setúbal consists of 12 terminals, which are partially concession for private use and for other for various public services. (Figure 28)



Figure 27: The Port of Setúbal's Terminals (Port Authority – P. of S., 2008)

1. *Multipurpose Terminal Zone 1– TERSADO:*

- Receives mainly breakbulk cargo, ro-ro, solid bulk and containers.
- Has a quay of 864m.
- A Ro-Ro ramp of 30m width.
- Water depth of -9,5m/ZH (for 170m) and -10,5m/ZH (for 694m).
- Covered storage area of 2,116m<sup>2</sup> and 102,000m<sup>2</sup> uncovered.

2. *Multipurpose Terminal Zone 2 – SADOPORT*

- Receives breakbulk cargo, ro-ro (heavy vehicles) and containers.
- Quay front of 725m.
- -15m/ZH depth for four dockages and the remaining is 12meters deep.

How are the Portuguese port's contributing to Portugal's competitiveness?

3. *Terminal Roll-On Roll-Off/Terminal AutoEuropa*
  - A dedicated terminal of Ro-Ro.
  - Quay front of 365m and a Ro-Ro ramp.
  - -12m/ZH depth.
  - Total area of 150,000m<sup>2</sup> warehouse area, while 60,000m<sup>2</sup> are concessioned to AutoEuropa for private use.
  
4. *Terminal SAPEC*
  - Terminal focuses on the movement of solid and liquid bulk.
  - A quay front of 112meters, allowing vessels to anchor with a maximum length of 200meters.
  - 25,000m<sup>2</sup> of uncovered storage area.
  
5. *Terminal for Liquid Bulk – SAPEC*
  - Focuses solemnly on liquid bulk.
  - Vessels with a length of up to 190m can anchor,
  - Water depth is -9,5m/ZH.
  
6. *Terminal SECIL*
  - Focuses on solid bulk (cement, coal, clinker).
  - Concessioned to a number of companies; Secil, CMP, Secil Martingança and Secil Prebetão.
  - Terminal consists of two quays; one is the west, which has a quay of 105m, enabling vessels to anchor up to 150meter and 170meters in length. The other quay is east; 98meters long, vessels up to 125meters long can anchor.
  
7. *Terminal of Uralada*
  - Focused on liquid bulk; alimentary oils and molasses.
  
8. *Terminal Praia do Sado*
  - Focuses on liquid and solid bulk, which is operated by ALMINA (Mine company) and EDP (energy production).
  - Quay length of 126m.
  - Water depth of -9,5m/ZH.
  - 19,000m<sup>2</sup> of uncovered storage area.
  
9. *Terminal Tanquisado/Eco-Oil*
  - Liquid bulk (fuels) and the cleaning of water and degassing of vessels.
  
10. *Terminal Mitrena – TERMITRENA*
  - Focuses on dry bulk cargo (ciment).
  - Uncovered storage area of 160,000m<sup>2</sup>.
  
11. *Terminal da Alstom Portugal*
  - Dedicated terminal for breakbulk cargo.

How are the Portuguese port's contributing to Portugal's competitiveness?

- A quay front of 90m, whilst vessels can anchor up to a length of 110m.

(Port Authority – P. of S., 2016)

## Appendix 2 - Port of Setúbal Logistic parks

The Port of Setúbal has logistic and distribution zones which are beyond its hinterland area, located around the port and the region of Setúbal. This adds value to logistic solutions and complements the basic port services.

### 1. *Logz – Atlantic Hub (Poceirão Multimodal Logistic Platform)*

This platform is still under construction but in the near future it is thought that due to its proximity to the port, the platform will also have a railway connection which will aid in the transportation of cargo to the north of Portugal, Badajoz, Merida and Madrid logistic platforms. In the initial phase, the platform will have 20 hectares. Moreover with its Atlantic position, the platform will become a cargo entry for cargo traffic coming from Africa and America. Whilst, at the same time creating a new/alternative entrance to the peninsula for European Short Sea Shipping. (Port Authority – P. of S. I, 2016)

### 2. *Industrial Park of AutoEuropa*

This Volkswagen AutoEuropa factory is located in Palmela, it is this one of the most important foreign investments made in Portugal in the last years. The park benefits from a direct connection to the AutoEuropa port terminal. (Port Authority – P. of S. I, 2016)

### 3. *SAPEC BAY – Industrial and Logistic Park*

This logistic park is located in the Peninsula of Mitrena, Setúbal, whilst being reachable through its maritime front, railway network and road. (Port Authority – P. of S. I, 2016)

### 4. *SPC Multipurpose – Road-Rail Terminal*

SPC Multipurpose is a company owned by the SAPEC group, operating in the supplying of road-rail logistics. Its multimodal focuses, enables it to operate general cargo, bulk and containers to the Portuguese and Spanish hinterland. SPC operates a wide range of areas, offering custom warehouses and container parks. Furthermore, SPC has two other platforms connected to the national railway' in Bobadela (Lisbon) and Valongo (Leixões). (Port Authority – P. of S. I, 2016)

### 5. *Bluebiz Global Parques*

This business park is managed by Aicep Global Parques and merely 3,5 Km from the Port of Setúbal. This park is aimed at setting up small industries, specifically mechanic, electro-mechanic and distribution services. This area used to be a factory own by Renault, however, they did not maintain their agreement with the Portuguese government regarding the minimum years of stay in Portugal, so, all the facilities became owned by the Portuguese government. As no other car manufacture wanted to take over the facilities, the government made Aicep Global

How are the Portuguese port's contributing to Portugal's competitiveness?

Parques in charge of its rehabilitation. Now a days, the park covers an area of 56 hectares; 100,000m<sup>2</sup> covered and 20 hectares uncovered, whilst also offering 2,000m<sup>2</sup> of office space. Most of the companies situated in the park are French aeronautic companies which export to the Airbus factory in Toulouse. (Cardoso, 2016)

### Appendix 3 – Port of Lisbon Terminals

The Port of Lisbon is a multifunctional port consisting of 18 terminals, 15 of which are specialized terminals. (Figure 29) On the norther bank of the Tagus River mainly containerized, Roll-on Roll-off and breakbulk cargo is handled, whilst on the southern bank specialized terminals in solid and liquid bulk are handled.

The Port of Lisbon consists of three cruise terminals; Alcântara Terminal, the Rocha Conde de Óbidos Terminal and the Santa Apolónia Terminal. All of these are located on the northern bank, where the center of Lisbon is located.



Figure 28: The Port of Lisbon's terminals. (Port Authority – P. of L. I, 2016)

#### 1. Alcântara Terminal

- Focus on deep sea container traffic and cruises.
- Own railway connection.
- Has a capacity of 350TEU.

How are the Portuguese port's contributing to Portugal's competitiveness?

- A quay length of 827m
- Depth of -13 and -14m.

2. *Santa Apolónia Terminal*

- Multimodal terminal focused on short sea and cabotage traffic.
- Direct lines to the Portuguese islands (Azores and Madeira), north of Europe and west (mainly Angola).
- Capacity of 164, 500TEU
- Quay length of 292m and 450m.
- Water depth of -7,3m and -10m.

3. *Lisbon Multipurpose Terminal*

- Dedicated short sea and cabotage market.
- Connections to the Portuguese islands and West African coast (Cape Verde and Guinea-Bissau).
- Capacity of 85,000TEU.
- Quay length of 480m
- Depth of -6m.

4. *Beato Multipurpose Terminal*

- Handles general cargo and some dry bulk cargo.
- Connection to Madeira and Mediterranean countries; South Africa and South America.
- Warehouse with four cooling cells and a capacity for 2,200 pallets.
- Quay length of 500m.
- Depth of -6m and -7m.

5. *Poço do Bispo Multipurpose Terminal*

- Focused on general cargo, containers, solid and liquid bulk.
- Main markets are Europe and Africa.
- Quay length of 420m.
- Depth of -5m and -6m.

6. *Trafaria Agribulk Terminal*

- A deep water terminal; one of the largest in Europe.
- Yearly handling capacity of 2,200.000 tons.
- Serves North and South America and the Black Sea region (Bulgaria, Romania and Ukraine)
- Depth of -7m and -17,5m.

7. *Beato Agribulk Terminal*

- Serves mainly the French, UK and Black Sea region (Bulgaria, Ukraine and Russia)
- Distribution hub of grain and other products which come from coast vessels or inland waterways.

8. *Palença Agribulk Terminal*



How are the Portuguese port's contributing to Portugal's competitiveness?

- Focused on dry bulk (oilseeds) and liquid bulk (food oils and biodiesel).
- Supplies various national and international companies.

*9. Barreiro Terminal*

- Dedicated dry bulk terminal.
- Main cargo is raw materials for the steel industry.

*10. Alhandra Agribulk Terminal*

- Used for the production of biodiesel.
- Reception and distribution of oilseeds.
- Optimal multimodal access (road, rail and inland waterway).

*11. Alhandra Terminal*

- Dedicated to cement handling.
- Optimal multimodal access terminal (road, rail and inland waterway).

*12. Barreiro Liquid Bulk Terminal*

- Is a strategic terminal for the reception, storage and distribution of fuel and chemical products.

*13. Benatica Liquid Terminal*

- Explored by REPSOL Portuguesa.
- Main cargo are; liquid fuels, asphalt, LPG and chemicals.
- Serves the Portuguese, Spanish and Northern European market.

*14. Porto dos Buchos Liquid Terminal*

- Explored by OZ Energia Gas.
- Serves the whole of the European market.
- Handles butane, propane, diesel and mineral oils.

*15. Naval Assistance and Bunker Station of the Port of Lisbon*

- Stocking of fuels and bunkering.

(Port Authority – P. of L. II, 2016)

## Appendix 4 – Port of Lisbon Logistic Parks

Due to the location of the Port of Lisbon, there is limited space for logistic and industrial parks being located at the terminals. In recent years no a lot of development has occurred regarding logistics parks in the surrounding of the port. A lot of the cargo which is destined for the national market is transport to the north of Lisbon, where logistic parks are situated. Furthermore, Lisbon being a large metropolitan area of more than three million inhabitants and Portugal's largest consumer regions. (Figure 30)

How are the Portuguese port's contributing to Portugal's competitiveness?

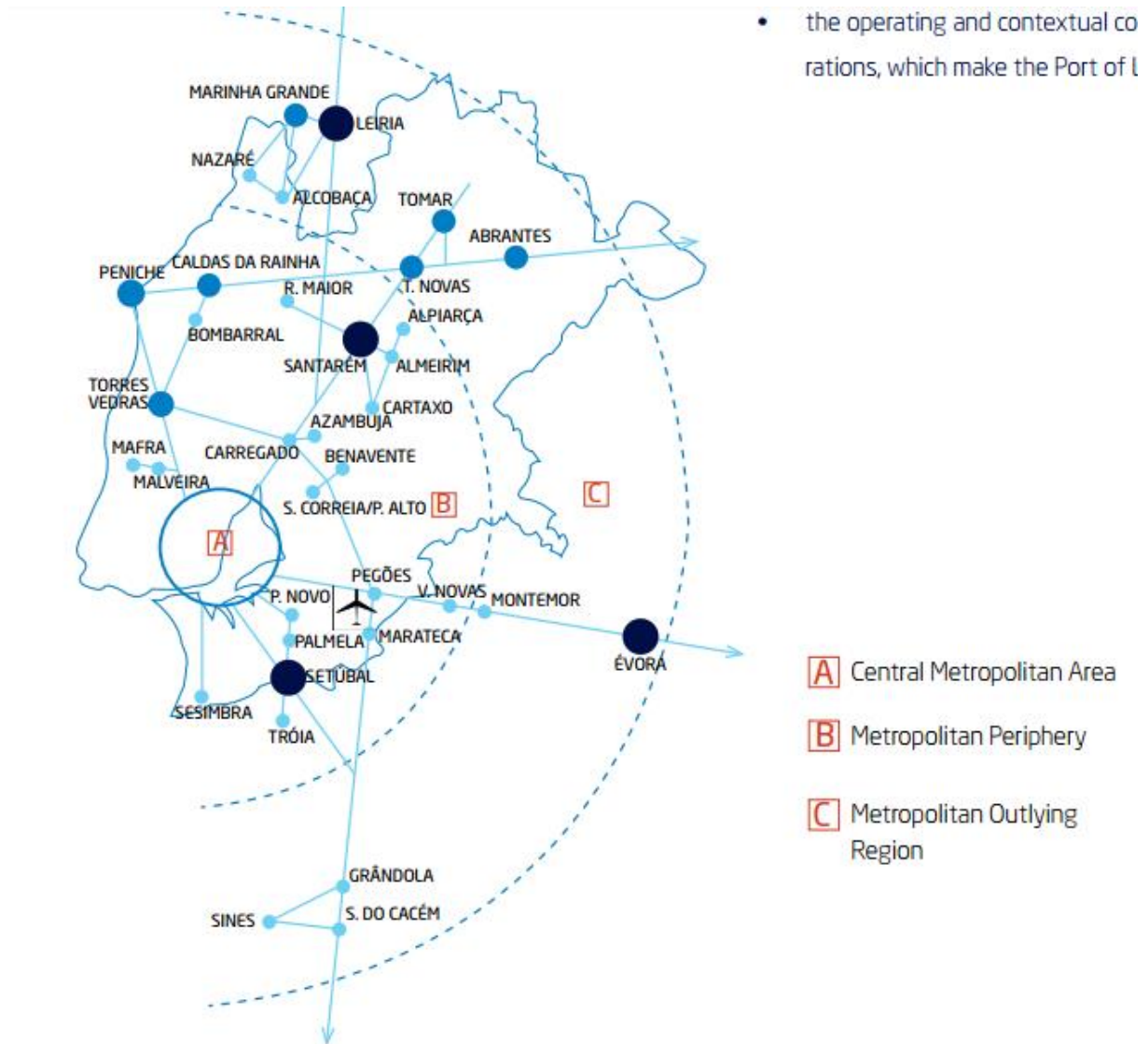


Figure 29: The metropolitan area of Lisbon. (Port Authority – P. of L. I, 2016)

There are two main logistic platforms for the Port of Lisbon;

1. Castanheira do Ribatejo

This logistic platform consists of 100hacters, and offers direct railway connections to the Port of Lisbon. With the possibility of an intermodal terminal to be constructed along the Tagus River. Serve mainly the Lisbon metropolitan region and the Port of Lisbon. (Abertis Logistica, 2006)

2. Bobadela

Bobadela Logisitc Platfrom consists of a total of 129,000m<sup>2</sup> and 21,000TEU's storage capacity. It is use not only by the Port of Lisbon but by most national ports. Tt has direct railway connections to most of the national ports and Spain. Trains coming from the Port of Lisbon, Sines and Setúbal need to pass Bobadela in order to reach the Spanish hinterland. (ALB, 2016)

How are the Portuguese port's contributing to Portugal's competitiveness?

## Appendix 5 – Port of Sines Terminals

The Port of Sines is made up of seven terminals. Including one leisure port and a fishing harbor. (Figure 31)

1. TGL – Liquid Bulk terminal.
  - Is the largest liquid bulk terminal in the country.
  - Natural bed of -28m.
  - Allows the simultaneous handling of differentiated products.
  - Can receive vessels up to 350,000 tons Dwt.
  - Direct pipelines from the terminal to ZILS and taking areas.
  
2. TGN – Natural Gas Terminal
  - National strategic importance; handles over 50% of the natural gas consumed in Portugal.
  - Depths of -15m.
  - Storage capacity of 390,000m<sup>3</sup>.
  
3. TPQ – Petrochemical Terminal
  - Has dedicated pipelines between vessels and the petrochemical complex in ZILS.
  - Terminal is run by Respol Polimeros.
  - Two storage tanks for ethylene (25,000m<sup>3</sup>) and propylene (22.000m<sup>3</sup>), two butadiene spheres (4,500m<sup>3</sup> each), ETBE tank (10,000m<sup>3</sup>) and an ethanol tank (6,000m<sup>3</sup>).
  - Depth of -12m/ZH.
  
4. Terminal XXI – Container Terminal
  - Receives the last generation of container carriers.
  - Natural depth of 17,5m/ZH.
  - Has a handling capacity of 1,700,000 TEU.
  
5. TMS – Multipurpose Terminal
  - Handles dry bulks, general cargo and ro-ro.
  - Depth of -18m/ZH.
  - Two gantry cranes with an average handling capacity of 2,000 tons per hour each. Used for coal mainly.
  - Railway access to Sines power plant and Pego power plant.

(Port Authority – P. of Sines IV, 2016)

How are the Portuguese port's contributing to Portugal's competitiveness?

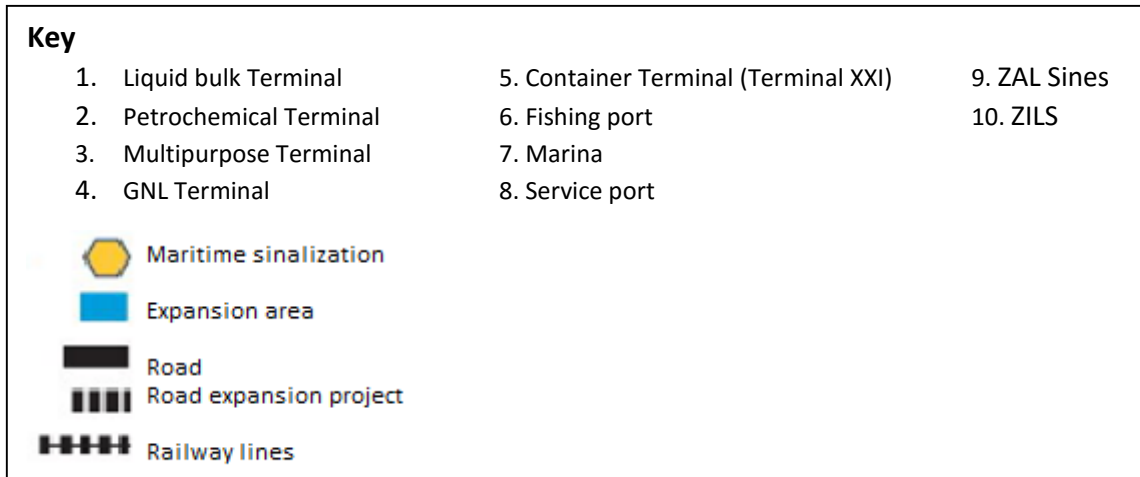


Figure 30: Port of Sines Terminals and Logistic Parks. (Port Authority – P. of Sines V)

How are the Portuguese port's contributing to Portugal's competitiveness?

## Appendix 6 – Port of Sines Logistic Parks

The Port of Sines has two large logistic and industrial parks in the port surrounding; ZALSINES and ZILS.

### 1. ZALSINES

ZALSINES consists of 30 hectares and is connected to the main national road routes and railway. It is managed by the Port Authority. Companies benefit from the proximity to the container terminal (Terminal XXI) and TMS – Multipurpose Terminal.

### 2. ZILS

ZILS is managed by Aicep Global Parques (public enterprise). It is the largest industrial and logistic area for companies in the Iberian Peninsula, localized besides the Port of Sines, near five specialized terminals and has an integrated railway line. (AICEP Global Parques, 2016)

Currently ZILS is mainly a petrochemical industrial and logistic platform, factories located in ZILS mainly use the TGL terminal – Liquid Bulk, due to its proximity. Aicep Global Parques does however want to diversify the platform, since infrastructure is in place for any type of factory. The zone still has a lot of unused capacity. The issues which Aicep Global Parques faces is not directly with the lack of interest investors but with issues between potential investors and political issues, such as fiscal instability, which makes investors reconsider. (Cardoso, 2016) Moreover, the Port of Sines has developed from a petrochemical port to a container port.

## Appendix 7 – Interview with Aicep Global Parque: Dra. Isabel Cardoso, business manager

1. Could you expand a bit about the functions and mission of Aicep Global Parques? Public enterprise.

Administrated – logistic parks, such as in Sines; ZALSINES.

Have logistic area – ZALSINES which administrated with the port authority and another area by themselves. Promotion also their part.

2. The companies situated in these two logistic parks are they mainly national, Spanish or from another country?

Have logistic area – ZALSINES which administrated with the port authority and another area by themselves. Promotion also their part.

It was an old factory of Renault. The agreement was that Renault stayed x years in Portugal but they didn't so everything became owned by the government. They tried to find another car manufacturer who wanted to take over the facilities but there was nobody. So they transformed it into a business park. Now there are aeronautic facilities there. Mainly French send to Toulouse.

Blubiz – French

3. What type of companies are situated in your logistic parks? Logistic companies, offices etc.?

How are the Portuguese port's contributing to Portugal's competitiveness?

Mainly Petrochemical. Now want to diversify. The park is situated near the refinery terminal hence, these petrochemicals being located there. But there is infrastructure in place to diversify to other sectors.

Galp: Portuguese company, Sonai, Repsol = Spanish company.

Regarding utility; water, electricity, gas, there is the possibility for other firms to install themselves. Have a lot of capacity which still is not being used hence allowing/enabling various firms to situated themselves in the park.

Global park never losses a project due to lack of capacity or lack of infrastructures but rather due to political issues, fiscal instability.

4. These firms, do they focus on serving the national or international market?

Setúbal: those firms export to France mainly. One of the company is supplier to Air Bus Toulouse. Due to the special working conditions for the plane parts, we, Aicep, also needed to adapt to customer the infrastructure.

Galp also exports. One of the biggest exporters of the country. Respol also exports.

5. How do you see the agreement made between the Port of Lisbon, Setúbal and Sines with the dry port of Badajoz?

We have a small market. Who installs themselves in Sines, comes with the idea to enter the European market or to enter Portuguese speaking countries.

We have to bid on accessibility and improve our hinterland to show that Sines is the gateway to enter other markets.

Badajoz sees Lisbon, Sines and Setúbal as their natural ports due to proximity.

Sines is one of the ports which uses train the most. Transports coal to two central power stations.

The new railway will lead to longer trains, more efficiency, competitiveness, and decreases the unit cost of transport.

Need to ensure that container don't go full and come back empty.

6. Do you think there is a good collaboration/communication between the Port administrations and your company which helps to improve the efficiency of these ports in general?

There is good collaboration and it has been improving in the last years. Port authorities create a number of events, have decreased bureaucracy such as with the JUP. There is also a effort to make companies happy and hence, come to Portugal. There are a lot of companies to come, they just need to become aware of the Port of Sines.

7. Recently Friopuerto opened their factory in ZALSINES. Do you think there are more companies willing to invest in Portugal, specifically in your administrated logistic parks?

The port of Sines started as a petrochemical port and has been evolving to container port. This has increased a lot.

We need to try to get big firms to realize and opt for Sines; such as IKEA, Declaton, which move large amounts of cargo. If one big firm comes, hope that others follow. To do this we need to work together with the port authority and container terminal operators to try to achieve this.

How are the Portuguese port's contributing to Portugal's competitiveness?

8. What is your opinion about the Portuguese hinterland? How could it be improved?  
Need to improve accessibility.

The first port if you come from the Panama Canal is the Port of Sines. If you come from the Suarez, then Portuguese ports also have a good location to northern ports.

Routes pass by Portugal, that is a fact, but another is if the ports are competitive enough for ships to stop and then enter Europe through Portugal. Need to work on this. Need to make the whole logistic chain more efficient.

Sines is a transshipment port. More and more becoming a hub port.

9. How could Portuguese ports competitiveness and efficiency improve?  
Personal opinion; more team work, specialize more on type of cargo for each port In China once asked if each port is a terminal, specific for a cargo since they are so near to each other when compared to China's ports and the distances from each other.

10. What are your thoughts regarding the Portuguese ports future?  
The strike in Lisbon is bad for our image. Companies reluctant to invest. Maersk opted to leave Lisbon. Sines doesn't have these problems. But it hurts the image of Portuguese ports if it continuous. Also, drastic change is bad for investment since investors want stability in the long term not every month changes. And we like to change often.

## Appendix 8 - Interview with Dr. Vitor Caldeirinha - Port Authority of Setúbal

1. In 3 years the Port of Setúbal grew around 25% and container movement doubled.  
What were the measures implemented to achieve this or what caused this growth?  
Due to the crises companies were forced to focus on export, since internal market stopped existing. In the last 3 years started this strategy (2008), but only from 2012 did this really becoming noticed. Cement, iron and copper exports grew. Another explanation was the increase in price of raw materials hence more justifiable to export more. Regarding containers; was the new terminal with a lot of space; 20 hectares, etc.. nearly all ships that enter Lisbon can enter Setúbal. So in the last 3 years the port was able to attract all major lines, McAndrews, Tagus. And these lines created their short sea shipping base here. Since every port wanted to be a deep sea port, the Port of Setúbal saw the potential to change the port to a SSH port. Also taking the environment into account. In order to differentiate from the others ports. Hence, these lines came here. The port authority also then encouraged trains in order to make it even more attractive for customers. Trains to Lisbon, also facilitated and attracted more cargo. Hence, the port started to grow. Now the port just needs more infrastructures. Also with the strikes in Lisbon more containers came to Setúbal. But then again there is the issue that the port also has congestion issues and needs to expand to correspond to the increase in demand. Currently, 150mil TEU's need 250mil TEU's space. There is space just needs to grow.  
From 50mil TEU to 120TEU in 3 years and now is around 150mil. Terminal didn't grow, containers grow.

2. What is the origin of most containers?  
Who started using the container terminal was the export of paper; Portosal, a factory located in Setúbal. So the export of paper incentivized the container terminal growth. Then also other

How are the Portuguese port's contributing to Portugal's competitiveness?

companies started to export and import. A lot export to Spain; especially horeca products'; e.g. tomatoes. Import; for the region of Lisbon. Come from the Mediterranean and north Europe. Also have a line to Angola, but it comes only sometimes.

3. Could you expand a bit about SSH in relation to the Port of Setúbal?

Have environmental restrictions, cannot dig deeper than 7m and also doesn't makes sense since Sines has better conditions for that. Hence, the port of Setúbal opted for SSH in regards to containers. For Ro-Ro, the port of Setúbal is a are deep sea port. Cars are send to China and receive from Japan and Korea. Would like to be transshipment port. Only containers SSH; Mediterranean, Europe, Africa. Send cement and receive wood to brazil.

4. Do you think there is a good collaboration/communication between the Port administrations and your company which helps to improve the efficiency of these ports in general?

The Ports of Setúbal market strategy is to become a SSH port. There is competition between the terminals. Whilst cooperation between port authorities exists with issues like JUP or promotion of the Portuguese ports as a whole.

5. How did the Port of Setúbal change from an industrial port to a commercial port?

The port only had a quay for general cargo and then had a lot of industrial near the quay. And now with Ro-Ro and container terminals and the SAPEC terminal the port more and more grew whilst dedicated terminals (industrial) had a stable share, there was an increase in multi-client terminals.

6. How do you see the agreement made between the Port of Lisbon, Setúbal and Sines with the dry port of Badajoz? Could you expand a bit about this agreement and the advantages it will bring to your port?

On the Portuguese side there are dry ports but not so much on the Spanish side. The Portuguese go with trucks and search along the border for Spanish goods. Portuguese ports reach max 150km into Spanish hinterland. So the ports strategy is to attract Spanish customers, however Spanish clients prefer to do business with a Spanish dry port due to language barriers, legislation. Whilst, with the port of Badajoz we have made an agreement that the cargo continues to be under Spanish legislation. It is then transport via the Portuguese ports. Try to captivate Spanish customers. This will take time.

To the Spanish hinterland, we transport via train. We receive a lot of fruit from Badajoz. Also, cargo reaches faster the ports of Brazil, Africa and USA if transported through the Portuguese ports. Faster than from Spain. Even if from Madrid, the ports are near but then the ship has to travel more. Whilst, if choose a Portuguese ports, the cargo has to travel more on land but less by water. So a competitive advantage for us.

7. How could Portuguese ports competitiveness and efficiency improve?

Improve logistic lines also to Spain. Invest in capacity – need more, Portugal takes a long time till they invest in new terminal constructions whilst in Spain this is a fast process. Invest in depth in Lisbon and Setúbal. And improve the productivity. Increase more competition. Increase concessions years. Spain 50years. And hence, invest more. Firms in Portugal reluctant.

8. The port of Lisbon, Setúbal and Sines are quiet close to each other. Do you see things as a benefit or does it create a sense of competition between the ports?



How are the Portuguese port's contributing to Portugal's competitiveness?

With the strike more cargo came to the port of Setúbal, e.g. McAdreus. Gradually the port of Lisbon expand to Setúbal and Sines since it had no space, like for petrochemicals. So functions which were done in Lisbon changed to the Setúbal and Sines. With the construction of the EXPO, this took away everything related to petrochemicals which were there before. See all ports as one large port for the region of Lisbon and south which gradually expanded due to space limitations.

9. Could you please expand a bit on the Ro-Ro terminal and AutoEuropa? AutoEuropa export's on average 50%, equalize to have enough space. Aren't producing now so a bit less but in 2017 want to produce another car model so maybe increase. Regarding other imports, receive Mercedes, BMW also now came. Nearly all car brands which are sold in Portugal come through our port.

10. What is your opinion regarding the Portuguese hinterland? Hinterland? Only to Spain no further. Notteboom concept states that the max range is 600km so only Spain. Max Madrid and hard to reach because Valencia is 370km and we are 600km away from Madrid. How to reach Madrid? Offer some other lines to the Atlantic which the Spanish port don't offer. Improve train access, which is already being done with the construction of Evora to Badajoz. Decreases price per ton. Improve ports? More cargo, reach further hinterland like Badajoz platform, JUP, train access. Now cargo from Portugal to Germany start using ship to rest of EU. Also Portuguese started to import less and then there was the problem that trucks would go full to the rest of Europe and come empty back. So some factories, in order to avoid paying twice as much, started using SSH.

## Appendix 9 – Interview with Dr. José Soares, Executive Member of the Board, Port of Sines

1. The Port of Sines grew a lot in the last years. What is behind this growth? Various factors; the location of the port – leads to success. Being a deep sea port so all type/size ships can come. In the container terminal have 17meter deep waters. And the water is rocky so an investment is made only once. So low costs in medium and long term. Short term high costs. Terminal 1 liquid bulk 45meters deep water. Young port so all new tech and infrastructure and also young people team which have a new mentality – view of the market and know their future depends on the port and its success. There is to be a win-win situation and this leads to a higher productivity. Sines has high productivity rates. Technology; JUP; all stakeholders and shareholder of the port activity involved. All authorities involved, operators, etc. 2.5 days before a ship comes, everything is ready for the ships arrival, doesn't need to wait for administrative reasons, this also the same for departures. When the ship finishes his operations, everything is already ready for it to leave, regarding administrative issues. And 100% without paper.

How are the Portuguese port's contributing to Portugal's competitiveness?

Also FUP – combine the billing of all identities in once; facilitates the process between the authority and the agent. Before the agent had to collect all the bills and then hand them over to the Amador.

Internal administrative also without paper.

A national port that operate the whole year around throughout the whole day. Also there is a flat rate. Meaning there is no price discrimination based on the time of the ship arrival. There are ports where if the ship arrives in the evening, they are not charged with an extra rate. Also on the weekend have this flat rate. This gives the shipping lines an insurance, that no matter what time or day he arrives at the port, he will have a fixed cost. And does not need to worry if the ship is running late nor needs to then recalculate everything due to evening tariffs.

Another competitive advantage of the port is the train connection. The port has more than 5 thousand trains per year. Cargo transported by road accounts for 3% of the hinterland access. Whilst the remaining 97% is transport via rail.

2. What is the origin of most containers?

Europe, Asia, America (central, north), Africa and South America. Brazil accounts for only 3% of this whole.

3. How do you see the agreement made between the Port of Lisbon, Setúbal and Sines with the dry port of Badajoz? Could you expand a bit about this agreement and the advantages it will bring to your port?

The Portuguese ports are all complementary and the bid on the dry port of Badajoz is made with the objective to enter in the long term the Madrid region, which is a large consumer market of the Iberian peninsula. Badajoz as a entry way; both in and out. Since it is more or less half way.

Frist try to captivate the Badajoz region; fruit and vegetables.

There is the notion that the ports need to reach a larger consumer market and this is one of the first steps to reach it.

4. The port of Lisbon, Setúbal and Sines are quiet close to each other. Do you see things as a benefit or does it create a sense of competition between the ports?

They are complementary. The market, the container market is very large. Lisbon is mainly for the Lisbon region, Setúbal has other players which serve the Lisbon area but also the local industrial area, paper and AutoEuropa. Sines due to its typology, its focused on transshipment. There is of course some competition but healthy which also leads to more productivity and efficiency which is then further reflected in the national economy. We do not steal market from each other, we each have our own focus which distinguishes us.

5. How do see the strikes which have occurred in the port of Lisbon.

We saw some growth due to the strike but I think its temporary. The port of Lisbon is the port which served the shipping lines needs then for sure they will return.

6. What is your opinion regarding the Portuguese hinterland?

have direct consumption or imports which can be directly consumed or serve industries such as AutoEurope which imports all pieces to construct the car and then export the final product. And I think this is the main bid that Portuguese ports should bid on since the population is also decreasing in the Portuguese hinterland so consumption also decreases. So the solution can be to increase import (raw materials) and export (finished products). Hence, should

How are the Portuguese port's contributing to Portugal's competitiveness?

develop more logistic areas which are fiscally also attractive, which allows new investments to come similar to AutoEurope which situate near our ports.

Or buy the package in Portugal. The bulk outside. Assemble them in Portugal. And then the company can write that their product was made in Europe. Reassure consumer.

Two objectives enter the hinterland via Madrid and improve our hinterland.

7. What are your thoughts regarding the Portuguese ports future?

There will be natural grows which is becoming more and more fierce. There are a lot of ports and the market is at a degree of maturity so can't expect drastic growth. Ports need to focus on areas where there is growth.

There will continue to be port growth with a strong focus on the national productive sector, which are an important bottleneck for ports since ports don't produce goods, they just trade them, only transition goods. If can increase hinterland then we, ports, can continue to have positive growth.

8. Remaining relevant comments:

Friopuerto: This investments demonstrates that our bid on Madrid is starting to show result. It is a key moment for the port, for this Spanish investor to situate itself in Sines to then send goods to Spain (Madrid).

Repsol: makes all the transformation in its factory. Enters the port as liquid bulk and leaves as a container the final product; pet in terminal XI. Near shoring.

Also have refinery which receives the raw products and then some refined product leave; oil mainly and also gasoline and diesel to France and America.

## Appendix 10 – Interview with Eng. Francisco Nascimento, Executive Board Director, Group ETE

1. Could you please expand a bit on the functions of Group ETE?

Group ETE 80 years in Portugal, a diversified company.

Barge transport along the inland waterways. Unload ships on smaller ships or we upload the cargo from the factory, bring it along the River Tejo, such as cement and clicker. The only doing this in Portugal. Before 2 but now just one.

Also act as a 3PL = we initiated it because we saw demand. Mainly cement. We take the cement, carry it take it to the terminal and then upload it on the ship.

Also are terminal operators in all major Portuguese ports. In Sines – Portsines. Makes coal and other products. We import the coal, treat the coal and the client exports it to various countries. We help/aid them.

Bulk goods we mainly receive coal, 5 million, imported. Comes from Colombia at the moment. Due to their low prices. Setúbal is varied market. Iron goes out. Import coils. Nacional the large producers are north of Tejo. Both in import and export.

2. What are your thoughts on the Portuguese hinterland?

Cargo that goes too Spain has two options; Elvas and Villar Formoso from these three ports. If loaded train in Sines has to go to other side of the Tejo; north Tejo and then back south.

Limited track, certain number of trains can only go on it.

How are the Portuguese port's contributing to Portugal's competitiveness?

92km need to be build. 452km from Sines to Badajoz. New track saves 135km. This would increase the potential of the ports. Also there is a lot of market to be reached in Spain. Saves time. And makes it possible that the trains can take the double of what they carry now. Badajoz interest if this new track is made. There are 250mil TEUs, it has a lot of fruit, such as cherries which they export to the north of Europe. If they export via Portuguese ports they save 1day. Meaning that the fruit can ripe longer, higher quality, higher prices, higher profit. Whilst if send to Seville they would have to collect the fruit 2 days earlier and then the ship itself also takes longer to reach the north of Europe since it has to pass around the whole of the Portuguese coastline. Extremadura government very interested. Interested also to import raw materials, for their factories. Sines is a natural port and has a lot of space.

3. What are your concerns regarding the strikes in the Port of Lisbon?

Big problem. Certain shipping lines sacred to go to Lisbon. Setúbal has the same syndicate as Lisbon. Made an agreement but was forced by the government. Sines no problems. They pay good because they have production in Lisbon doesn't have production.

4. Do you think there is the sense of collaboration or competition between the ports of Lisbon, Setúbal and Sines?

They are complementary. Each port has a focus. Sines is for transshipment mainly. Lisbon for national market. Setúbal is for SSH and Ro-Ro. Eng. Francisco Nascimento has administrative in all three and says so.

5. How do you see the new agreement made between the syndicate and the port authority for the following 6year?

Pessimistic due to previous experience. More than 30years working in this sector. This was not a consolidated but a political agreement. Political pressure. Prime minister said today we need an agreement. And an agreement was made. Hence, see it pessimistic. Could be solved by maybe by taking very harsh measures. In the port of Aveiro there was the similar problem. The port ended up bankrupt and the syndicate didn't believe it. In the agreement it says that more 70 people will be employed. However, Lisbon is losing cargo, and makes no sense to hire more people. Hence no money to pay the salaries later.

6. As a terminal operator how do you see the concession periods in Portugal?

Concession max is 30years> should be more, Spain changed its legislation. The whole of Europe changed only Portugal still didn't. It should be longer since as an investor, we need to know for how many years we can amortize the investment. Equipment costs a lot and also last a long time. The higher the investment needed and the shorter concession periods leads to higher costs per ton moved.

Investors reluctant to invest or then invest in old equipment, old technology, not new, more efficient tech.

7. Why are concessions not so long in Portugal?

Because the argument is that with shorter concession there is more completion and lower prices. But this is illusion, since the prices may even be lower but the efficiency also lowers. More time to load = lower efficiency.

Yes prices and tariffs should be controlled. But this is done by the market itself. And if not there is port authority. Like this ports will not modernize.

How are the Portuguese port's contributing to Portugal's competitiveness?

Sines. Finish our contract next year, 2017, it is extended for 5year automatically if the power station run by EDP continues to operate there, which is the case. So till 2022. We have the possibility to buy a crane but this costs 3-4millions for 6years have to amortize. Are growing in cargo. Then would have to increase the tariffs. Then won't have any profit; so will not do anything. Port authority's also not happy with this. This way the ports will not develop. Ports want to modernize but then do not alter the policies.

8. How do you think the Portuguese ports could improve their efficiency?

Longer concessions. Proper labor legislation, especially in Lisbon. This is an important issues. Sines is growing. Setúbal but Lisbon not so much.

9. How do you see the future of the Portuguese ports?

Well, depends of the economic development of European economy. Ports develop if the economy develops. Of course they can contribute.

Sines has a good future. Has area to expand.

It will take some time for shipping lines to feel reassured to come back to Lisbon.

Setúbal and Lisbon are more limited to the national market.

## Appendix 11 - Ocean Weeks Seminar – Future of the Portuguese ports

1. Autoerupa; Dra. Sandra Augusto, Logistic Director

Location advantage. When China opened its boarder to foreign cars. There was the possibility to easily export the cars via the port of Setúbal. This is not normal. Since all other factories are in the west and go from Emden (VW distribution hub) but due to the large volume, we were able to ship directly to China. We also import all our pieces from various countries.

5-6years search for alternatives to road. For cost competitive reasons. Financially viable. Now have a railway connection from our terminal directly to the factory.

The port of Setúbal is essential. They are a part of our supply chain. Financial efficient if the supply process is efficient.

2. Cerealis, Dr. J. Amorim, Director

Production of pasta, flower and cereals.

400mil tons import raw goods every year.

85 ships per year, 4 to 5 tons dry bulk. Wheat mainly.

Use the port of Lisbon – terminal do Beato and the port of Leixoes.

Origin? 80% from EU – France, UK, Germany, 20% Canada and USA.

8 meters deep water in the terminal do Beato. Limits the ship capacity that we can receive. More operation efficiency, would be better for us. Also raw material price is extremely important in our sector. Hence, we need to optimize their logistic supply chain due to the price volatility.

How are the Portuguese port's contributing to Portugal's competitiveness?

Utilization in the operations of the ports. The more uncertainty there is regarding their shipments due to the ships being in waiting queues. Hence the rates that they have to pay to their suppliers inevitably also increases and reflects this. For every extra euro per ton is 400mil euros that they have as extra costs in their imports. This then leading them to have to increase prices for the final customer.

3. Transix; Dr. F. Lima, director

New route to China and Angola. First wanted to increase the hinterland of the terminal de Alcantra. They were limited by the maximum capacity of the terminal which didn't justify having direct lines to main world markets. Create a department to increase the hinterland, hence Spain. Managed to successfully attract cargo from Spain. So much that since 2002, created Transix, a firm created with various offices spread in Spain but Portuguese investment. Now is Turkish owned. Objective to attract cargo for the national ports; Setúbal, Sines, and Lisbon under others. At a certain point attracted 60mil TEU per year from Seville to Lisbon. But at a certain point they lost competitiveness to Spanish ports. Lost services. Part also due to strikes, lack of modernization. Hence, unable to attract cargo. So as a firm, in order to survive this created an operator in the America (central/Latin). Made offices there. Recently created (2month) cargo from China to Mozambique. This also good for Portugal since their long run aim is to gather enough container cargo to come to Portugal more often. From China most good are for small to medium sized enterprises hence, large operator first take the Chinese cargo to Rotterdam or Antwerp (the major ports) and then the cargo comes to Portugal via road or transshipment.

Since there was not enough cargo. Found that if they sold also to Mozambique, Angola, Brazil and create consolidated cargo then enough to also come to Portugal. Then justifiable. Consolidated cargo from Latin America to Portugal, which mainly is destined to Spanish market.

4. MADLOG; Dr. Carlos Vasconcelos, President of the executive board.

If the ports do not become more efficient, then despite them having a great location, we will not be able to attract more cargo nor ships.

The national container market is limited also due to our size. But it is not through our national market that we can gain large international shipping lines. We need to turn to container transshipment and the Spanish market. But this is only able if the ports are efficient.

Personally, the only efficient ports are Sines and Leixoes.

Higher members in the parliament want to decrease concession time. Whilst our neighbors; Spain, are increasing concessions. Like this we will not be able to compete and generate investment nor generate efficiency hence can't able to attract more cargo.

Ports can't let themselves be run by a small minority group which butts their egoistic needs in front of the general interest. It is not correct that they but thousands of jobs, firms and even the port at risk. If we do handle this issue once and for all seriously. Has been going on for the last 10years. As can be seen they are able continue to be able to stop the economic activity.

How are the Portuguese port's contributing to Portugal's competitiveness?

Need to limit their power. If don't manage this I am very septic that Lisbon situation will change in the future.

Can't focus solemnly on transport but need to satisfy the customer and their increase in fully integrates logistic services. In this direction we should walk, this logistic solution can look positively into the future.

Sines also a proof of this success. They demonstrated that we can be competitive and are attracting more and more cargo also from Spain.