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Presented by:

Janice Garreaud

Advisor:

Sandro Sánchez

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Dedications

This paper is dedicated to my family and Antonio for their constant support. Without you, this work would have not been possible.



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Abstract

The current report is a consulting project elaborated for SIMA (Servicios Industriales de la Marina S.A.). The aim of the study is to analyze the company, focusing on SIMA Callao and generate a report on current problems and an assessment of possible solutions. The main problem SIMA Callao struggles with is low profitability. As they are a state-owned company, they carry out most of their work for the government, securing only sufficient funds to cover costs. For this reason, SIMA would become more profitable if it they take up more contracts with private clients, most particularly in the ship repair sector which offers higher contribution margins. Other secondary problems include, instability of the workforce (naval officers with short contracts), lack of managerial skills, inflexible labor force, inadequate wage and promotion policy, lack of a supplier's payment policy, insufficient and obsolete infrastructure, among others.

SIMA Callao should use their increased capacity to serve private clients and shift their focus to ship repair in order to improve the company profitability. In addition, adjustments in the HR, procurement and finance need to be made to achieve both stability and efficiency in the company. With these changes set in place, it is expected to raise SIMA's annual profit to 5-6%. Opposition from SIMA's direction is expected. However, it is important to understand the social benefits that will be generated with an improved profitability: new jobs would be created and a multiplier effect would be generated when growth reaches other related industries.

Resumen Ejecutivo

El presente informe es un proyecto de consultoría elaborado para SIMA (Servicios Industriales de la Marina S.A.). El objetivo del estudio es analizar a la empresa, centrándose en SIMA Callao y generar un informe sobre los problemas y plantear posibles soluciones. El principal problema de SIMA Callao es la baja rentabilidad. Ya que son una empresa estatal, llevan a cabo la mayor parte de su trabajo para el gobierno, los cuales no generan ganancias. Por esta razón, SIMA podría generar una mayor rentabilidad tomando contratos con clientes privados, especialmente en el sector de reparación que ofrece mayores márgenes de contribución. Otros problemas secundarios incluyen, inestabilidad de la mano de obra (oficiales navales con contratos de corta duración), falta de capacidad de gestión, fuerza laboral inflexible, inadecuada política salarial y de promoción, falta de una política de pago de proveedores, infraestructura insuficiente y obsoleta, entre otros más.

SIMA debería utilizar la nueva capacidad para atender al sector privado y cambiar el foco de sus operaciones a la unidad de reparaciones navales para mejorar la rentabilidad de la empresa. Asimismo, son necesarios ajustes en las políticas de recursos humanos, adquisiciones y finanzas. Con estos cambios, se espera elevar el margen neto de SIMA entre 5% y 6%. Se espera cierta oposición por parte de la dirección del SIMA. Por ello, es importante resaltar los beneficios sociales que se generarán con los cambios propuestos: la creación de múltiples puestos de trabajo.

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Chapter I: General Situation of the Organization

1.1. The Company

1.1.1 History

Servicios Industriales de la Marina (SIMA) is a Peruvian state-owned company with experiences over 170 years. Founded in 1845, the company focuses on developing strategic activities related to national security and defense. They were created to provide shipbuilding and technical services to the Peruvian Navy (SIMA Memoria Annual, 2015). The first shipyard was established in Callao Province in Lima, and then this was followed by the construction of a similar, but smaller, location in Iquitos in 1864. This last project sought to create development in one of the most unexplored regions of Peru: The Amazon (Servicios Industriales de la Marina, 2012a).

SIMA was contracted to build ships and armaments for the navy during the War of the Pacific in 1879. The shipyard was destroyed after the war and only operated to repair small-size vessels. In 1938, the dry dock was inaugurated in Callao to serve large sea vessels. In addition, the company entered into the shipbuilding business, and began constructing vessels for the private sector. Later on, in 1958, SIMA constructed BAP Zorritos of 6,000 dead weight tonnage (DWT), which was the largest in Latin America at that time. Additional docks and pipe workshops were created as a result of their increasing demand. The shipyard began regularly constructing four large vessels at a time with capacities of up to 12,000 tons (Servicios Industriales de la Marina, 2012a).

During the 1970's, SIMA became one of the leading shipyards in the region, delivering one large vessel every year, which was a very competitive construction period. Moreover, a significant merger between SIMA and Servicio Industrial de Iquitos (SIDI) enhanced the building capacity for the company. In 1975, they built a new structural boilermaker complex in Chimbote, where they focused on metalworking. In 1982, SIMA

built their first warships for the west coast region. Over the past few years, the company developed incremental technological innovations, and expanded their docks in Callao. Due to the continuous developments, the company was able to achieve international certifications in quality including the IMS, ISO 9001 and another certificates that guarantee the quality of their services (Servicios Industriales de la Marina,, 2012a).

1.1.2 Vision, mission, strategic objectives

Vision. “Be recognized as the best shipyard in Latin America and become pride of the Peruvian industry” (Servicios Industriales de la Marina, 2016).

Mission. The Industrial Services Marine SA, main shipyard in Peru, carries out the maintenance, modernization and construction of the Peruvian Navy's ships and executes projects related to shipbuilding and mechanical metal for the state and private sector, national and abroad, with the most stringent quality standards, in order to contribute to the national defense and the socio-economic and technological development of the country (Servicios Industriales de la Marina, 2016).

Strategic objectives. The primary objective of SIMA is to serve the interests of the Peruvian Navy and other state entities by developing the naval industry and complementary businesses. It is also in charge of promoting the social, cultural, professional and technical development of their employees. Additionally, SIMA serves the private sector in order to bolster their profitability so that they can reinvest in the business (Servicios Industriales de la Marina, 2016).

1.1.3 Business units

Shipbuilding. Shipbuilding is one of the most critical business units at SIMA Peru. SIMA has built ships for over fifty years with experts and engineers from specialized sectors to ensure high quality in addition to client satisfaction. The size of the shipyard allows the company to build different sizes of vessels: tug boats, fishing boats, personnel carrier

motorboats, naval units, large ocean liners, etc. The main shipbuilding operation is located in Callao and has an area 300,000 m² including docks and berths. The shipyard can receive ships up to 50,000 DWT. Meanwhile shipbuilding in Chimbote is for building small boats. The one in Iquitos provides berths and docks, which is capable of building personal carrier motorboats, tanker barges, aluminum and steel ships (Servicios Industriales de la Marina, 2012b).

Ship repair. The ship repairs division is the core business of SIMA Peru. SIMA provides maintenance and engineering services for vessels and fishing ships. Although SIMA's principal client and priority is the Peruvian Navy, SIMA Callao also repairs for clients with dry docks for ships up to 25,000 DWT. Their ship repair services include sandblasting, hull, propulsion and steering system repair, boiler making works, and maintenance of diesel engines. Its principal client in this unit is the government. SIMA has a good quality of facilities and an experienced team. This allows SIMA to be able to serve local clients and international sectors (Servicios Industriales de la Marina, 2012b).

Metalworking. SIMA Peru is also well-known for its activities in the metalworking sector. Over the years, SIMA became involved with the construction of infrastructures (especially bridges) across the country. Even though metalworking is not the core business of SIMA, the company is able to work on different projects in Peru's infrastructure. The metalworking unit is divided into four different segments: steel bridges, gates, pressure pipes and various structures (Servicios Industriales de la Marina, 2012b). One of the most common contracts carried out by this unit is constructing of bridges. SIMA has built 90% of bridges in the country. Those bridges are located in dangerous or undeveloped areas of the country, and SIMA is one of the only company that has the resources needed to develop those infrastructures (Novoa, personal communication, July 7, 2016).

After 30 years of conducting business in the metalworking industry, SIMA has now distinguished themselves as the leading expert. SIMA metalworking is performed in the three operation centers located in Callao, Chimbote and Iquitos. They have processing capacity which exceeds 8,000 tons of steel a year. With this capacity, they are able to supply metalworking goods to small and large engineering projects in any region of the country or even abroad (Servicios Industriales de la Marina, 2012b).

Weapons and Electronics. SIMA also has divisions in the weapons and electronics design industry. The company has a microelectronics design center and creates sonar, radars, automated control systems, etc. SIMA is the only service representative in Peru which allow them to “perform certified way maintenance of radars, turns and navigation equipment in Units Surface Marina de Guerra del Peru and individual work mainly in merchant and fishing vessels.” The main site for weapons and electronics operations’ is located in Callao (Servicios Industriales de la Marina, 2012b).

1.1.4 Structure

As every state-owned company, SIMA's priority is to service the country and society. Although it is part of the Defense Minister and regulated by FONOFE, SIMA maintains a private administration and has an administrative, economic and financial autonomy, which is led by the board directors (composed by Peruvian Navy Generals). Additionally, the government focus and the short-term orientation of SIMA, makes it impossible to implement process and client management orientation. Many of the officers lack the administrative, managerial and technical skills that are required for the industry. Their military way of doing things with strictly hierarchical organization obstructs communication and decision making. Additionally, officers usually only serve the company for two years, which is too short to manage the company and implement changes (Servicios Industriales de la Marina, 2008a).

1.2. The Shipbuilding and Maintenance Industry

1.2.1 Industry information

The shipbuilding industry. During the last century, thanks to the escalation of technology and economic trade agreements, international commerce has increased considerably. For centuries, sea logistic services had been the only means of international transportation. Today, despite the appearance of air logistics, maritime transportation still accounts for 80% of the global trade (United Nations Conference of Trade Development, 2013). Figure 1 shows the evolution of global trade, seaborne trade and global GDP. The maritime transportation preponderance should be noted in relation to the global trade. Additionally, the figure shows the stretch correlation between the shipping industry (seaborne shipments) and the global economy.

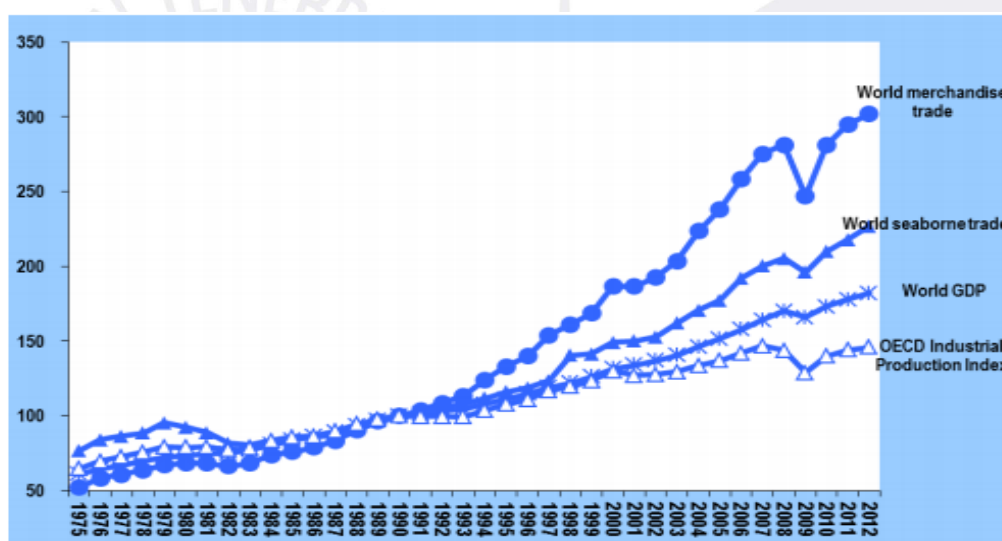


Figure 1. World seaborne trade evolution in comparison to the world merchandise trade, world GDP and OECD industrial production index from 1975 to 2012 (1990=100). Data are from “Recent developments and trends in international maritime transport affecting trade of developing countries”, United Nations Conference on Trade and Development (UNCTAD), 2013 (http://unctad.org/meetings/en/SessionalDocuments/cid30_en.pdf).

The shipbuilding industry started to become of national interest after the Second World War. The governments noted the importance of this industry for international commerce, the number of workers that it could employ, the supported industries that could be

bolstered and the need for manufacturing and repairing national vessels (Gerasimou, 2014). As with many other strategic sectors, the shipbuilding industry has been subsidized for long periods in order to maintain its competitiveness. Today Japanese, Chinese, Korean and Spanish industries receive government support. The Chinese subsidies during the period 2006-2012, reduced the shipyard costs by 15-20%, and this allowed them to increase their global market share (Kalouptsidi, 2014).

During the last years, the shipbuilding sector has been facing difficult times because of the relation it has with the global economy. Before 2008, the industry had been growing at exponential rates (The Naval Architect, 2010). The sales' peak was reached in 2007, with 169.6 million of new orders. However, ever since the global financial crisis, the industry has entered in a depression, reaching its lowest peaks of 33.6 M and 38 M orders in 2009 and 2012 respectively (The Shipbuilder's Association of Japan, 2016). The evolution of shipbuilding orders is presented in Figure 2.

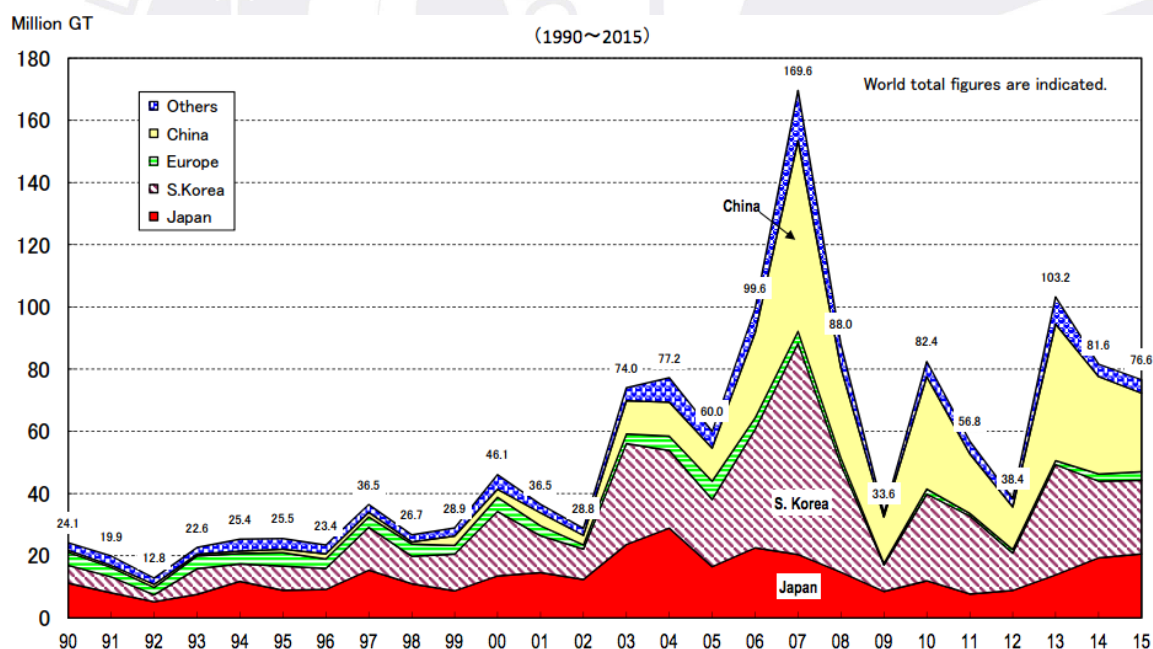


Figure 2. World new shipbuilding orders total and by markets (1990-2015). Data are from “Shipbuilding Statistics”, The Shipbuilder's Association of Japan, 2016 (http://www.sajn.or.jp/e/statistics/Shipbuilding_Statistics_Mar2016e.pdf).

With the shipping industry being affected by financial crisis, the demand for new vessels decreased. However, this industry recovered rapidly and continued growing from 2010 onwards. Figure 3 shows the historic levels of seaborne trade since 1990 divided by industry. Furthermore, the weak financial market affected the shipbuilding industry, and limited credit services for producers and buyers. Finally, the falling oil prices worsened the situation, since producers started cancelling orders for drill ships (Ji-Eun, 2015).

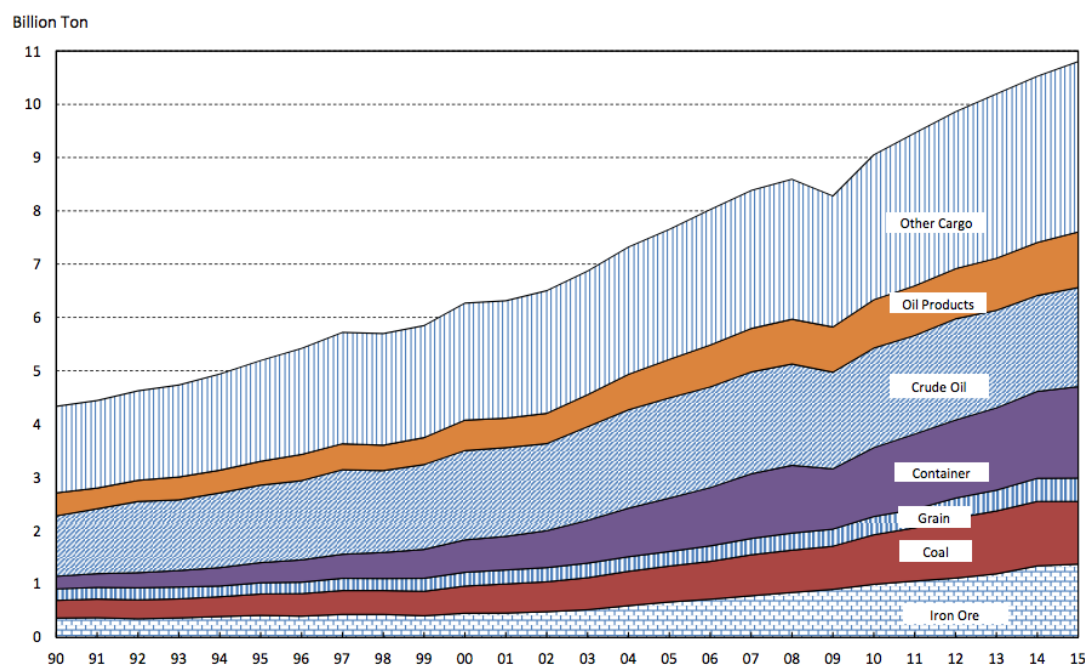


Figure 3. World seaborne trade (1990-2015).

Data are from “Shipbuilding Statistics”, The Shipbuilder's Association of Japan, 2016 (http://www.sajn.or.jp/e/statistics/Shipbuilding_Statistics_Mar2016e.pdf).

Moreover, new competitors coming from low labor cost countries have reconfigured the shipbuilding market. During the post war era, the industry was dominated by the US and Europe. However, due to the intensive-labor characteristics of the industry, the production moved to low-wage countries, located mainly in Asia (The Naval Architect, 2010). Currently the production is concentrated in the Korean, Chinese and Japanese shipyards (SIMA-Peru, 2016). China and Korea lead the production with 33% and 30.9% of market share, followed by Japan with 26.9%. This leaves Europe with 3.7% and the rest of the world with 5.6% (The Shipbuilder's Association of Japan, 2016).

Other emerging nations who have entered the shipbuilding industry are Brazil, India, Malaysia and Vietnam. One recent trend in the industry is that shipping companies are also investing in shipyards as an integration strategy to gain control of the whole supply chain (Global Industry Analysts, 2012). Additionally, some shipbuilders are outsourcing the construction process of parts to producers of countries with lower costs. Finally, a last trend related to the increasing steel prices, is the possible integration between shipbuilders and steel producers (SIMA-Peru, 2016).

The declining demand of ship orders after the financial crisis, along with the increasing competition, have caused an oversupply and excess of capacity in the world's shipbuilding industry. Shipbuilders around the world have lowered their prices to attract buyers, obtaining little profits or even incurring in a loss just to keep operations going (Zhiming, 2016). The figures in the shipping industry are similar, with 50% of loss-making enterprises during the last three years (Hellenic Shipping News, 2015).

The ship repair industry. There are three types of repair services: conversion or reconstruction, repair of damages, and maintenance. According to Mackenzie's 2004 report (as cited in SIMA-Peru, 2016) the last category represents in average 75% of the total sales of these three services. Ships must undergo periodic maintenance every two to three years to keep their vessels operable and up to standards. Additionally, sometimes shipyards receive unscheduled ships related with unexpected issues.

The size of the shipyards varies from larger companies with international presence to small yards with regional and local presence (SIMA-Perú, 2016). In the last years, the industry has been favored by the increasingly aging number of vessels and the decision of owners to increase their lifespan. Repair is less costly to owners than buying new vessels. Finally, environmental accidents and regulations have increased the pressure to improve maintenance frequency ("Shipbuilding and Repairing", 2016).

According to the Organization for Economic Co-operation and Development (2008), shipbuilding and ship repair businesses are complementary industries, enabling many shipbuilders to counteract the effects of their cyclical and capital intensive business. These two activities share many of the same types of equipment and infrastructure needed to carry out in the same yard. Some of the facilities that are equally shared between the two industries are: painting, the pipe and steel division, berths, warehouse and lifting installations.

Numerical data and statistics about the ship repair business is limited. However, there is data available from the Japanese industry that suggest that this business is much smaller than shipbuilding in monetary sales. Historically, from the total sales of Japanese shipyards, the repair business has represented between 4.1% and 24% (The Shipbuilder's Association of Japan, 2016). Figure 4 shows the evolution of sales of both businesses from 1990.

Additionally, this industry has similarly been affected by the global financial crises. It is shown in Figure 5 that the European repair and maintenance markets decreased in 25% in 2008, even more than shipbuilding, which fell to 10% (Eurostat, 2015).

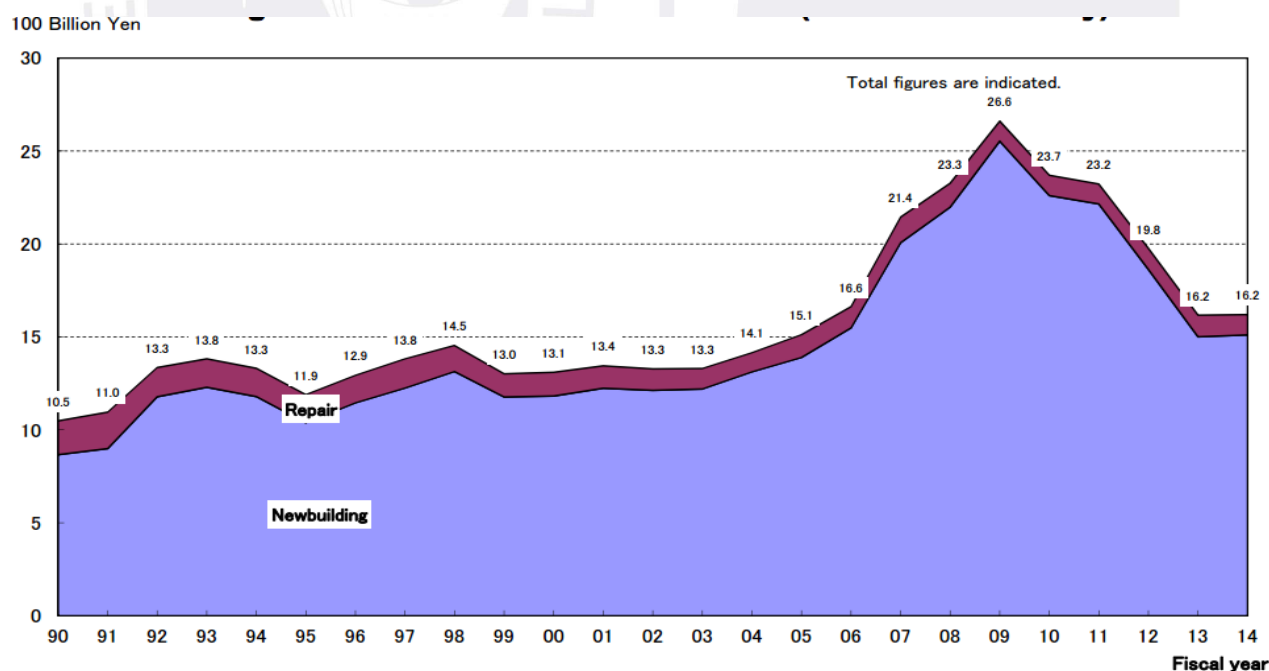


Figure 4. *New building and repair sales of Japanese SAJ members.*

Data are from: "Shipbuilding Statistic", The Shipbuilder's Association of Japan, 2016 (http://www.sajn.or.jp/e/statistics/Shipbuilding_Statistics_Mar2016e.pdf).

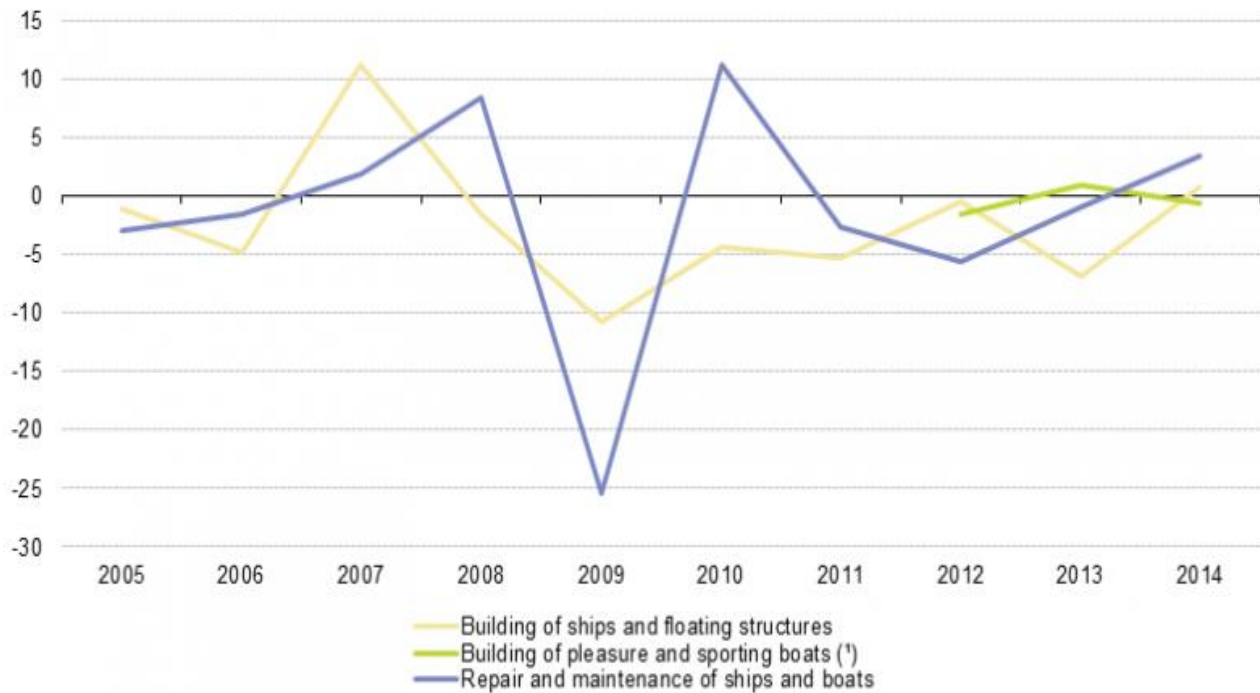


Figure 5. Annual growth rates of shipbuilding and repairing from EU 28.

Data are from “Annual Growth Rates of Ship Building and Repairing from EU 28”, Eurostat, 2015

([http://ec.europa.eu/eurostat/statisticsexplained/index.php/File:Annual_growth_rates_of_ship_building_and_repairing_\(NACE_Rev_2_activities\),_EU-28,_2005%E2%80%9314.png](http://ec.europa.eu/eurostat/statisticsexplained/index.php/File:Annual_growth_rates_of_ship_building_and_repairing_(NACE_Rev_2_activities),_EU-28,_2005%E2%80%9314.png)).

Most ship owners program their maintenance services in ports along their routes; deviation is uncommon nowadays. Generally, the cost of the service is the determining criteria, though many clients also consider the quality of the repair and the steel which is used. Within every ship route, there are cheaper areas: Poland and the Baltic States in northern Europe, Turkey and the Balkan States in the Mediterranean/Southern Europe and China in Asia (which is the cheapest worldwide). During the past two decades, Singapore has become the leader in the repair industry. However, China has been recently increasing its market share by offering lower prices. The Chinese shipbuilding industry is favored not only by their cheap labor but by the steel production, which is also subsidized at US\$1.00/kg compared with Singapore's price over \$2.00/kg (Thorpe, n.d.).

1.2.2 Key successful factors (KSFs)

There are several key success factors which characterize the shipbuilding and repair industry. First, the number of ships the company builds or gives services, factors directly into their overall success (Lorange, 2008). By having a large number of vessels, the company will have a stronger bargaining power with their suppliers. Also, by having different ships, the company will improve their maintenance skills.

Second, especially for the repair business cost and location are fundamental aspects. Ship owners would look for cheap shipyards that are located along their routes to reduce time and costs. However, in the shipbuilding industry, many clients consider quality and the steel which is used (Thorpe, n.d.). For instance, shipyards with ISO's certifications and which are environmentally responsible have higher demand.

In addition, an excellent location can guarantee not only an efficient shipping process but also the volume that a shipyard can get. For instance, the location and connectivity of nearer ports are essential to guarantee a strong demand of repair services. The connectivity index would be explained later in Chapter VIII. Finally, it is crucial for a shipping company to diversify their services. Diversification in the marine industry allows companies to achieve long-term success. For instance, it is essential to offer maintenance services, to counteract shipbuilding's seasonality.

All in all, as a state-owned company, SIMA also has unique KSFs. They have a great experience, an excellent reputation, sufficient funds and one of the cheapest labor costs of the region. Also, during the last 30 years, SIMA has accumulated reliable experience at metalworking. This is a strong resource to the shipbuilding and ship maintenance industry.

1.3 Industry Attractiveness

Michael Porter's model aim to assess the attractiveness of an industry by analyzing five different forces, which shapes the overall market and its key players.

1.3.1 Threat of new entrants

The threat of new entrants is low. In the shipbuilding and maintenance industry, the barriers to entry are extremely high mainly because of the required initial investment. First, the capital cost of building a shipyard is extremely high and finding a proper location is difficult. Second, the construction of a ship is a long and complicated process and involve extensive investment and intensive workforce. Third, it also requires high technical expertise and experienced engineers. Fourth, the main raw material, steel, is unstable since the market prices fluctuate often (Kakatkar, A, 2009).

However, even though the threat of new entrants is low, the industry has grown in the last few decades with new key players who are challenging incumbents. For instance, the China Shipping Industry Co. was founded in 1998 and is now a leader in the shipbuilding and maintenance market (China Shipping Industry Co., 2009). For a long time, South Korea dominated the cost-competitive commercial shipbuilding. However, due to the high investment from the Chinese government in their shipbuilding industry, China is becoming the biggest threat for incumbents (School, 2015).

Also, there is a shift in the global business world towards sustainability, and it will affect the shipping industry. For instance, “The International Maritime Organization is discussing regulations that may force ships to belch out less carbon dioxide and has introduced tighter limits on other pollutants” (The Economist, 2010). These strict regulations could deter newcomers from entering this risky and highly competitive industry.

1.3.2 Threat of substitutes

The threat of substitutes is medium – low. It could be argued that the threat of substitutes depends on the type of ships. For instance, commercial ships are threatened by airplanes; however, air transport is much more expensive than using container shipping for transport. However, pipeline could be a better alternative over maritime transportation since

it is safer and relatively inexpensive (School, 2015). Finally, the shipbuilding and maintenance businesses that operate in a niche industry, allows them to be protected from a threat of substitutes (Olsen, 2016).

1.3.3 Bargaining power of buyers

The bargaining power of buyers is relatively high. First, there are few buyers in this industry and they are price sensitive. Also, the changing prices for buyers is insignificant, especially during exchange fluctuation periods. Due to the high expensive prices of this industry, the buyers retain a lot of bargaining power. Finally, due to the excess of capacity and decreasing demand, the power of clients has increased in the last few years (Nam Sung, 2009).

1.3.4 Bargaining power of suppliers

The bargaining power of suppliers is medium - low. The most important material is steel, which is a commodity. Therefore, suppliers cannot influence the price very much. Additionally, there are a great number of steel manufacturers, so the changing cost of suppliers remains low. Additionally, some parts of the ships are not manufactured by the repair company. Rather, they are supplied by part manufacturers. The concentration of this industry is low (Nam Sung, 2009). Finally, some components like navigation systems and ships engines are outsourced from specialized companies, which have a medium power of negotiation (Kakatkar, 2009).

1.3.5 Competitive rivalry

Based on Porter's forces analysis, the rivalry among competitors in the shipbuilding and maintenance industry is high. It is highly concentrated in various regions, with Asia as the largest producer. As it can be observed in Figure 6, production is concentrated in China, South Korea and Japan. For instance, the five largest firms are located: Hyundai Heavy Ind (South Korea), Daewoo (South Korea), China State Shipbuilding Corp. (China), Samsung

(South Korea) and Imabari (Japanese). Figure 7 displays the five largest ship manufacturer's sales.

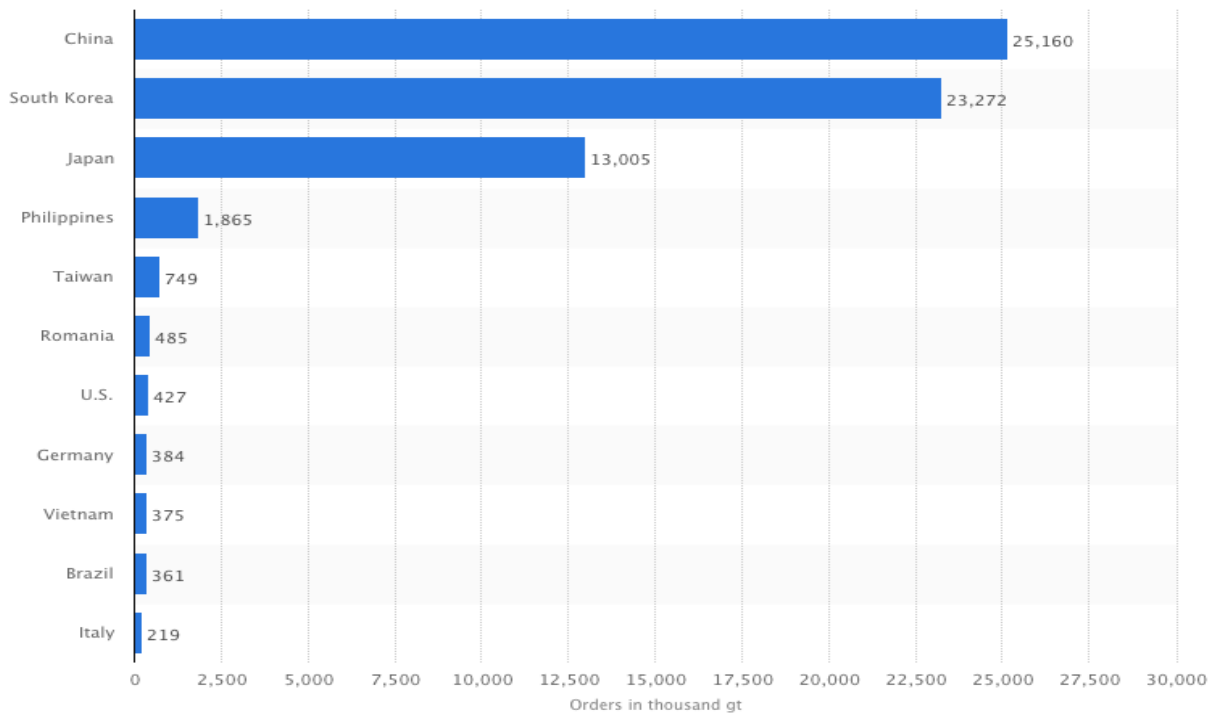


Figure 6. Largest shipbuilding nations in 2015, based on completions in gross tonnage (in 1,000s).

Data are from “Largest shipbuilding nations in 2015”, Statista, 2016

(<http://www.statista.com/statistics/263895/shipbuilding-nations-worldwide-by-cgt/>).



Figure 7. The top five world shipyards by market value.

Data are from “Infographic”, World Maritime News, 2016

(<http://worlmaritimeneews.com/archives185935/infographic-top-5-shipyards>).

Also, according to the US Bureau of Labor Statistic, the shipbuilding and repair “rank among the most hazardous industries in the world” (Stellman, 1998). Additionally, the industry is characterized by different ship buildings: commercial, army vessel, submarines,

etc. Therefore, the industry is also divided among those segments. Another important characteristic is that there is low product differentiation, with companies competing mainly on price. Finally, exit barriers are high due to the great investments in facilities and infrastructure which demotivate firms to leave the market. Figure 8 shows a summary of the shipbuilding's five forces.

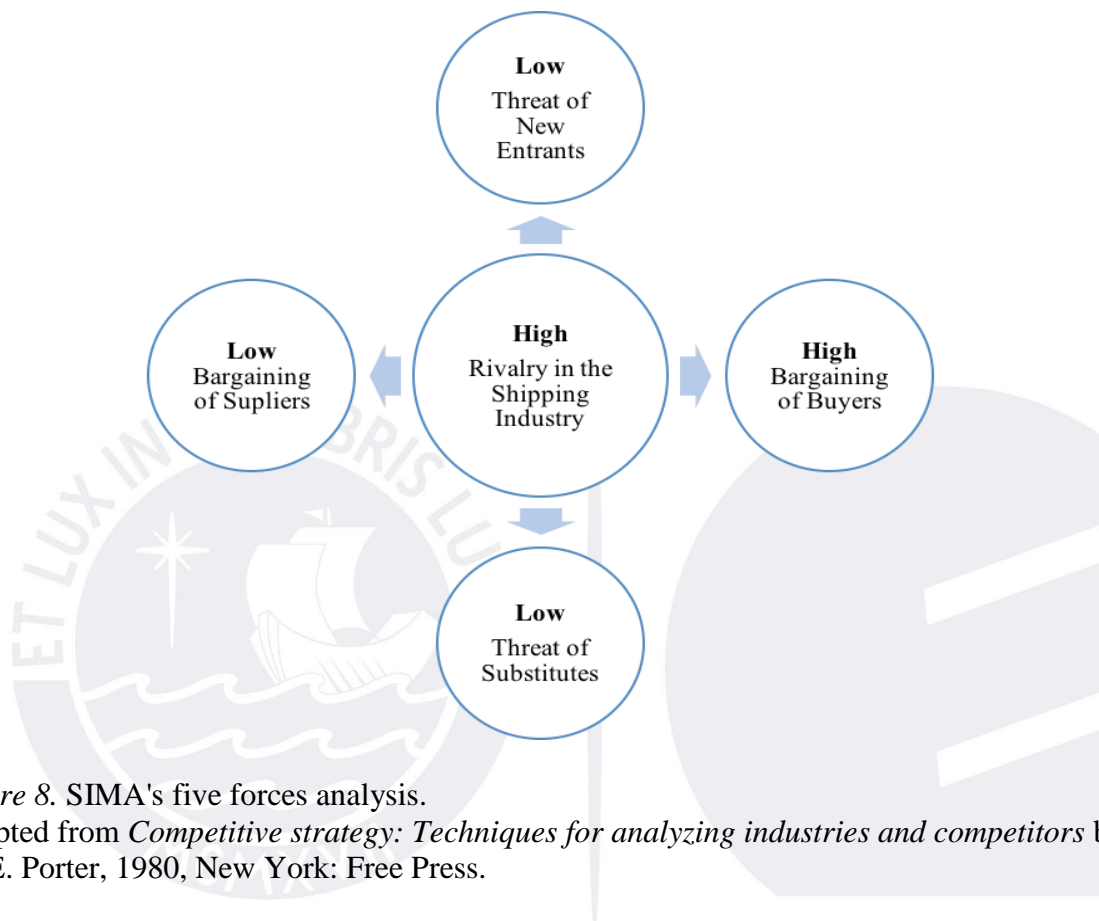


Figure 8. SIMA's five forces analysis.
Adapted from *Competitive strategy: Techniques for analyzing industries and competitors* by M. E. Porter, 1980, New York: Free Press.

1.4 External Analysis

1.4.1 Political

Due to the strategic nature of the shipbuilding industry, governments around the world may give assistance to this sector in a variety of ways, such as direct subsidies, tax incentives, cheap credits and restructuring assistance. In addition, governments should have considerable interest in ship repair and conversion activities because of their significant potential for direct and indirect employment of labor (Senturk, 2011). Moreover, countries

which have strong shipbuilding sectors may benefit in the coming years. *The Spring 2015 Industry Report* noted: “nations enjoying increasing economic growth and in the midst of rising geopolitical tensions may be increasingly interested in procuring more advanced naval products from other countries” (Go Maritime, 2015).

However, in the political sphere, there are three main concerns that SIMA faces. First, they depend on the government in turn and Ministry of Defense’s plans. During Ollanta Humala’s government (2011-2016) SIMA sales were mainly absorbed by the Peruvian Navy and other public projects. Therefore, the company made little profits during this period. In addition, the Callao terminal port, managed by the company APM have manifested expansion projects that could jeopardize SIMA’s location. Finally, SIMA could suffer from government’s corruption or mixed interests (Barzola, Bomble, Esquen & Koenig, 2013).

1.4.2 Economic

Shipbuilding is one of the oldest, most opened and fragmented markets in the world (Ahmed, 2016). This business is closely related to the shipping industry and for instance to the international trade and global economy. Therefore, ever since the financial crisis the shipbuilding and repair business have entered into a depression. Since then, shipyards have been suffering from low profit margins, depressed prices and a significant number of shipyards have gone out of businesses. The recovery is being slow and the industry is still facing a decrease in demand of new orders (The Shipbuilder's Association of Japan, 2016; Ahmed, 2016).

Moreover, shipbuilding is highly dependent on the price of its main material, steel, which presents high volatility. Its highest latest peak was in 2012; however, in the last years its price has been falling from 4,000 CNY/Metric Ton in 2012 to 2,000 CNY/Metric Ton in 2015 (Evans-Pritchard, 2015). Although SIMA has benefited from the falling prices during

the last four years, commodities prices are uncertain and tendencies could turn around in any moment.

From a local perspective, Peru has achieved economic stability during the last years characterized by low levels of interest rates and inflation. Also, the international commerce of Peru have grown under different trade agreements. “In recent years, under presidents Alan Garcia (2006-2011) and Ollanta Humala (2011-2016), economic activity has benefited from a favorable international context, particularly from improving terms of trade” (“Peru Economic Outlook”, 2016). Peru recently count with several trade agreements with South American countries, the US, China, EU, Japan, Mexico etc.

Furthermore, Peru stands out as an ideal strategic partner for China and Asia, both for its strong economy and its geographical location. In its role as a gateway from Latin America to China, Peru can strengthen its position as a logistics hub on the continent, thus taking advantage of investments in mining, energy and infrastructure. If Callao becomes a shipping hub, large vessels with a capacity of 15,000 containers would arrive creating more connections and more destinations for Peruvian exports (MINCETUR, as cited in Barzola et.al, 2013).

During the last years the Peruvian government has privatized their ports, giving the concession to international companies. These ports are: (a) South Port Terminal of Callao, (b) Port of Matarani, (c) Paita Port Terminal, (d) Terminal boarding Mineral Concentrates in the Callao Port Terminal, (e) Multipurpose North Terminal (Callao Port Terminal) and (f) New Port Terminal of Yurimaguas. The purpose of this privatization program was to modernize the infrastructure an increase traffic of boats. This results in an opportunity for SIMA which has a larger demand of vessels that may require maintenance and / or repair when they reach the Peruvian territory (Barzola et.al, 2013).

1.4.3 Social

The shipbuilding industry employees are known as *shipwrights*. These are highly skilled workers specialized in different types of ships or job positions (Ahmed, 2016). Peru has a good amount of talented engineers and qualified persons to accommodate a shipyard expansion. However, there is also a great level of illiteracy in the workforce which must be taken carefully into consideration when handling such delicate projects. The company employs more than 1100 workers at the shipyard in Callao alone and most of these gain a valuable amount of skills and education (Novoa, personal communication, July 7, 2016).

In addition, since the shipbuilding industry is labor intensive, labor costs are significant and could represent a competitive advantage or disadvantage depending on the countries' wages. If comparing Peru to other countries of the region, this country has one of the lowest minimum wages (\$258) in comparison to Chile (\$373) and Panama (\$529). This represents a great opportunity to SIMA, which could differentiate by offering lower prices (Federacion Interamericana de Asociaciones de Gestion Humana, 2016).

1.4.4 Technological

One challenge SIMA Callao will encounter in the close future is staying up to date with the new technologies used in the shipbuilding industry. Today, there are several international shows where new technologies are presented such as The International Workboat Show and the Maintenance World Expo. Some of the most important developments in the shipbuilding industry are green technologies oriented to reduce carbon footprints, which are explained in the environmental analysis (Ahmed, 2016).

Also, rubber airbags, known also as MAX airbags, rubber inflatables or marine air bags are new technologies used to perform maintenance and repair services. "With airbags, shipbuilders are able to build and repair in massive scales without having to turn down businesses and stay extremely competitive without having to build costly docks/rails to

increase their capacity” (Chan, 2015). Lastly, *advanced outfitting* is a concept that involves assembling the outfit components like machinery, seating structures and piping into a small unit at the same time that the vessel hull is fabricated. With this technology, the building cycle time is reduced as well as the production costs (Chan, 2015).

3D printing technology is starting to be used by the industry but few are affordable and sustainable. Recently, NSW Carderock constructed a hospital ship using 3D printing. This technology could be used to build complex geometries of ship and quick replacement of ship’s part for repairing purpose. Also, shipbuilding robotics are being developed as a driver of efficiency and a method to prevent workers for doing dangerous tasks. It could also solve the shortage of skilled labor in many countries. As an example, the South Korean shipyard, Geoje, operates using robotic systems, which represent 68% of its production processes (Kumar, 2015).

1.4.5 Environmental

The industry, like many other sectors, is trending towards increasing demanding green goals. From an environmental point of view, the SIMA Callao’s location needs to take reasonable precautions for any potential tsunami or earthquake. Furthermore, as mentioned above, there are stricter environmental policies and norms today which need to be met and followed.

BIMCO, the world's largest shipping association (more than 2,200 members globally), updates and distributes a document called *The Guide to Maritime Environmental and Efficiency Management*. In these guidelines, the organization outlines a number of important topics ranging from efficiency, oil and air pollution, sewage, underwater noise, etc. (BIMCO, 2014). Some of the latest green technologies are: greener engines that minimizes nitrogen oxide, ultra-efficient optimized cooling systems, minimal friction hull paint to boost

fuel efficiency, ultra-efficient propeller designs, solar cell hybrid system and diversification of fuel mix (Chan, 2015).

Finally, Liquefied Natural Gas (LNG) engines are emerging as an environmental friendly alternative. “In the LNG engines, CO₂ emission is reduced by 20-25% as compared to diesel engines, NO_x emissions are cut by almost 92%, while SO_x and particulates emissions are almost completely eliminated” (Kumar, 2015). The industry is also trying to develop technologies to utilize renewable sources of energy such as wind and sun. However, the largest solar powered ship is just 100 metric ton and seems not viable to make a 100% solar commercial ship. However, there are many technologies today which support the big ships to reduce fuel consumption, *Eco Marine Power* is one of the most popular (Kumar, 2015).

1.4.6 Legal

As mentioned before, SIMA is regulated by FONOFE. This institution sets regulations and controls of Peruvian state-owned enterprises and is responsible for approving the annual budget and investment proposals. Some relevant legislations that regulates SIMA operations are law No. 27073 and No. 28583. In particular, the aforementioned Law No. 27073 (1999), The Law of Industrial Services of the Marine, regulates the activities of the company within the scope of the defense ministry and establishes its main purpose that is to preferably serve the Navy of Peru. Private customers should be addressed only to self-finance the company. This regulation constitutes a great disadvantage of SIMA compared to their local and regional competitors, since the law limits the scope of decisions of this firm (Barzola, et.al, 2013).

Another important regulation is the law No. 28583 of *Reactivation of the National Merchant Marine* (2005). It was created after the 90s, period in which the merchant navy broke and virtually disappeared due to the release of loads and increase of charges for ship's

purchases. These measurements threat the shipbuilding and repairs industry since demand slow down during this period (Barzola, et.al, 2013). Other important laws are: No. 1138, *Law of the Peruvian Navy*; No. 1138, *Law of the organization and functions of the Defense Ministry*; No. 1031, *Promotion of efficiency of state businesses* and strategic planning and guidelines from The Defense Ministry, Peruvian Navy and FONAFE. Finally, it is important to note that although it is part of the Defense Minister and regulated by FONOFE, SIMA maintains a private administration and has an administrative, economic and financial autonomy.

Table 1 presents a summary of the opportunities and threats found in the external analysis.

Table 1

Opportunities and Threats

Opportunities	Threats
<ul style="list-style-type: none"> – Shipbuilding receives the support of many governments around the world as it is considered as a strategic industry. – International trade of Peru would likely grow under different trade agreements and due to its politic and economic stability. – Peru´s location stands out as an ideal partner for China and Asia, creating an opportunity on becoming the hub of South America. – The privatization of ports during the last years have increase the traffic of boats. – Peru has a good amount of talented and qualified engineers and one of the lowest labor costs of the region. – Development of new technologies are oriented to increase productivity and reduce environmental impact. 	<ul style="list-style-type: none"> – SIMA´s public demand depends on the government in turn – SIMA´s location could be threatened by an expansion of Callao´s terminal port. – The shipbuilding industry is closely related to the global economy. Therefore, since the financial crisis it has been suffering from low profit margins, depressed prices and low demand. – The industry is highly dependent on the price of steel which is presents high volatility. – The industry is having stricter demands to reduce its environmental impact. – SIMA´s main purpose is to serve the Peruvian Navy and private customers should be addressed only to self-finance company.

1.5 Internal Analysis

1.5.1 Administration and marketing

One of the biggest issues of SIMA is related with its ownership structure. As a state-owned enterprise SIMA's objectives are set by the government. Therefore, the firm's priority is to serve the Peruvian navy and other projects of metalworking required by the government. By performing these projects SIMA makes no profits, limiting the firm's growth and the possibility of generating a higher social impact.

In the other hand, SIMA maintains a private administration and has an administrative, economic and financial autonomy. However, the direction is composed by Peruvian navy generals, who usually count with technical skills but lack from administrative and managerial capabilities. In addition, they usually serve the company for a short period that inhibits the continuity of plans and the implementation of a long-term strategic planning (Novoa, personal communication, July 7, 2016).

Moreover, they are not allowed to promote their services. In this area, the government limits their publicity. SIMA is only allowed to use direct marketing. For instance, they have to advertise in a specialized manner to a narrow audience since the government needs most of their time for their projections. They also lack from market intelligence, which means that they do not fully know their competition and positioning strategy. At the same time, SIMA doesn't count with a segmentation and positioning strategy to differentiate from its rivals (De Izcue, personal communication, July 7, 2016).

1.5.2 Operations

In the Administrative aspect of the Callao shipyards, a key strength SIMA has is the ISOs certifications. They meet the requirements and are up to date on these standards, and so a high level of credibility comes with the projects they carry out. Another important strength

is the privileged location that SIMA Callao's shipyard occupies along the South American coast (De Izcue, personal communication, July 7, 2016).

However, when talking about its infrastructure and capacity SIMA has the weakness of not being able to service every sort of ocean liner. In addition, their machinery and equipment are obsolete and outdated. There is also insufficient infrastructure of dry work of small and medium sized ships, limited parking space, inadequate equipment for submarine repairs and lack of infrastructure for the attention of large vessels (Novoa, 2012).

This affects three other related areas: sales, operations and logistics. Not having enough capacity and the proper industrial machines makes them loose sales and decreases levels of efficiency and productivity. Lastly, purchasing errors are also common generating production delays and bottlenecks since the work is performed manually and operators are not fully trained (Novoa, 2012).

1.5.3 Finances

Related to this weakness, SIMA is limited financially. The net margins of the last years have been small even though the total revenues have been increasing (Servicios Industriales de la Marina, 2016). As a result, the company does not have the funds to improve their infrastructure, increase capacity and invest in R&D. The government's projects that SIMA takes on are not for profit. In addition, although the goal is to break even, the company ends up losing money because of setbacks and mistakes along the way (Novoa, personal communication, July 7, 2016). Chapter II and IV shows a complete analysis of profit margins and sales, which are disaggregated by business unit and by sector to explain differences and financial results.

Moreover, SIMA lacks from policies in the procurement and financial division. The company lacks from a supplier's payment policy which has forced the company to deal with

smaller suppliers. In addition, their international operations are not secured by financial instruments, having the risk of scams and bankruptcy of the counterpart.

1.5.4 Human resources

SIMA's human resources is a strong point in the industry because of the professionals they hire at a low cost. The navy counts with highly qualified engineers and specialists on shipbuilding tasks. Today, SIMA gives work to 1100 workers at their main shipyard (Novoa, personal communication, July 7, 2016).

However, the organization is highly hierarchical and there is small communication. Employees are not encouraged to think creatively to find solutions and new opportunities because they are used to following orders. In addition, SIMA lacks from a wage and promotion policy that results in low motivation of the workforce. Promotions are now based in experience and seniority which creates a feeling of injustice and demotivation specially of new workers. Lastly, the employees are over specialized in a single job, which inhibits them from rotating to other positions according to counteract demand (Novoa, 2012).

1.5.5 Information systems and technology

For communications and information systems, the company needs to replace or update their equipment to perform their work more effectively. A good portion of their technology is obsolete. SIMA works with Microsoft Office packages but lacks from an ERP software to integrate all the firm's information. Thence, it is extremely important for the firm to invest in an ERP system in order to integrate data, improve efficiency and take better informed decisions. SIMA also needs to create a R&D division focused on improving quality and generating competitive advantages (Novoa, personal communication, July 7, 2016).

Table 2 presents a summary of SIMA's strengths and weaknesses that have been elaborated based on the internal analysis.

Table 2

Strengths and Weaknesses

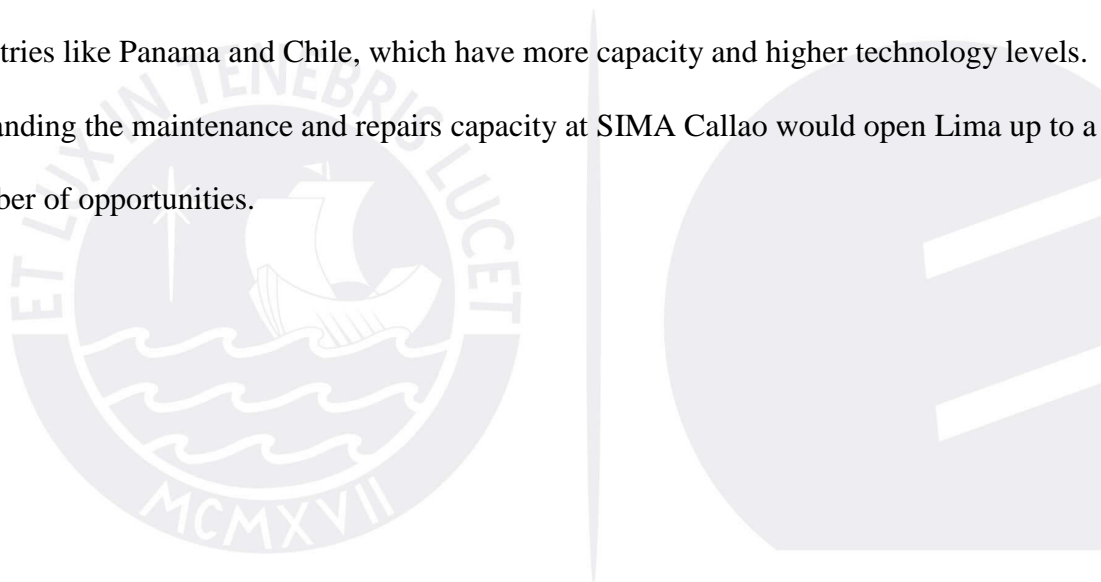
Strengths	Weaknesses
<ul style="list-style-type: none"> – SIMA maintains a private administration with economic and financial autonomy. – SIMA counts with international ISO certifications, which enhance its reputation. – Its privileged location in South America constitutes a competitive advantage over its rivals. – The firm counts with highly qualified engineers at a low cost. 	<ul style="list-style-type: none"> – SIMA´s objectives are set by the government. Attending public projects limits the firm´s growth and possibility of generating higher social impacts. – SIMA´s direction is composed by Peruvian naval generals who lack from administrative and managerial capabilities. – High turnover rates of naval officers inhibit long-term planning. – SIMA has marketing restrictions and could not promote its services on media. – They also lack from marketing intelligence and a segmentation and positioning strategy to differentiate from its rivals. – Its machinery and equipment are obsolete and infrastructure and capacity is insufficient to attend demand. – It also presents procurement and financial problems due to the lack of policies. – Net margins during the last years have been small even though total revenues have been increasing. – The organization is highly hierarchical and there is small communication. – The firm lacks from a wage and promotion policy based in results. – Employees are overspecialized in a single job which does not allow rotation. – The firm lacks from an integrated information system and a R&D division.

1.6 Conclusions

The shipbuilding industry is slowly recovering from the world´s financial and facing low profits margins and depressed prices. The repairs unit however, has not been affected in the same level as ship-owners prefer to repair their vessels rather than buying new ones. In addition, increasingly aggressive competition in the world market like China, is threatening SIMA´s worldwide position.

Moreover, SIMA Callao's greatest strength is also its biggest weakness: the government's close ties to the company could either push the project forward or deter any future opportunity for the potential shipyard. As explored above one of the key problems is the small profits SIMA generates, which inhibits them from growing and increasing their capacities. Other weaknesses of the company are related to the lack of policies the obsolete and insufficient infrastructure and the lack of a long-term planning.

Ultimately, its high skilled and low cost workforce, its ISO certifications a its great location should be taken into consideration to formulate its positioning strategy and competitive advantages. Therefore, SIMA needs to move on and improve its facilities if they want to remain competitive on the market, not only with China but with other neighborhood countries like Panama and Chile, which have more capacity and higher technology levels. Expanding the maintenance and repairs capacity at SIMA Callao would open Lima up to a number of opportunities.



Chapter II: Key Problem

2.1 Description

SIMA's key problem has been formulated after recovering information from different sources: observations during a visit to SIMA's facility at Callao, interviews with Carlos Novoa (Strategic Planning Manager) and the marketing team (lead by Carlos Alberto De Izcue), information handed by the firm and diverse external sources. After the investigation it has been determined that SIMA's key problem is related to a financial weakness: the small profits obtained during the last years. Different problems located at different divisions and levels of the organization are related to the firm's profitability. They are explained in Chapter V.

Net margins have been bordering upon 2.3% during the last two years, despite of having increased revenues. In 2015, the company increased its sales to 318.9 M soles in comparison to the 250.9 M soles of 2014. However, the net margin remained essentially unchanged: 2.38% in 2015 and 2.35% in 2014 (Servicios Industriales de la Marina, 2016). Appendix A shows the Profit and Loss Statement of the year 2015.

2.2 Timing and Magnitude

In order to study the financial results, it has been compiled SIMA's sales and net margins of the last 10 years which are shown in Table 3. It can be noticed that sales levels have increased year after year starting in 106M soles in 2005 and growing up to 328M soles in 2015. However, net margins do not show a clear tendency and have large variations in 1-year periods. They also present a large dispersion, ranging from -12.24% in 2006 to 2.38% obtained last year.

The average net margin of the last 10 years is 0.29%. However, the last two years, SIMA has obtained the highest profit margins of the 10-year period. Profit margins could have fluctuations since it depends on the proportion of public against private sales. They also

depend in the distribution of sales among business units which is explained in the next section.

Table 3

SIMA's Annual Sales and Net Margins 2005-2015

Year	Sales (PEN)	Net Margin
2005 ^a	106'661,417	0.18%
2006 ^b	108'730,636	-12.24%
2007 ^b	150'741,312	2.06%
2008 ^c	184'358,965	0.48%
2009 ^c	198'894,319	1.70%
2010 ^d	171'595,938	2.24%
2011 ^d	220'843,686	1.95%
2012 ^e	215'380,796	1.22%
2013 ^e	213'322,867	0.84%
2014 ^f	250'913,520	2.35%
2015 ^f	328'946,739	2.38%

^aServicios Industriales de la Marina (2006, pg.65), ^bServicios Industriales de la Marina (2008, pg.65), ^cServicios Industriales de la Marina (2010, pg.65), ^dServicios Industriales de la Marina (2012, pg.65), ^eServicios Industriales de la Marina (2014, pg.65), ^fServicios Industriales de la Marina (2016, pg.65).

2.3 Location

To find the location of the problems it is important to analyze the distribution of sales by sector and by business unit. First, the low profits can be attributed to the sales distribution by sector, as shown in Table 4. In the last four years, more than 70% of total sales have been performed to the public sector, which are orders that do not generate profits for the company. The other 30% of sales comes from the private sector. However, during the first six months of the current period, SIMA has reversed the distribution of sales, with only 15% of public sales and 84% destined to the private sector.

Table 4

Distribution of SIMA's Sales by Sector (2012-2016)

Year	Public Sales %	Private Sales %
2012	70%	30%
2013	88%	12%
2014	91%	9%
2015	84%	16%
2016 Jan-Jun	15%	84%

Note. Data are from “Consultas Tesis” by C. Novoa, 2016.

It is also important to analyze the distribution of sales by business unit since they present different profitability ratios. First, the shipbuilding unit is currently facing difficulties trying to generate profits. As mentioned above, the declining demand for ship projects after the financial crisis, along with the increasing competition from low-wage countries has caused an oversupply in the industry. As a consequence, shipbuilders have lowered its prices to attract buyers. The low prices and the increasing costs of steel are leaving producers with minimum profits and some shipyards are even incurring losses to maintain their operation going.

Meanwhile, ship repair's margins have not been affected in the same scale. SIMA's net objective margins by business unit are shown in Table 5. The margin's objectives have been set according to historic levels and profit goals of the company. Shipbuilding has the lowest margin of 5%, followed by metal works with 8% and maintenance and repair with 15%.

Table 5

Minimum Net Margin Objective by Business Unit

Business Unit	Net Margin Objective
Shipbuilding	5%
Ship Maintenance and Repair	15%
Metal Works	8%

Note. This minimum margins were set in memorandum DES-2011-065 in April 2011. Data are from “Consultas Tesis” by C. Novoa, 2016.

2.4 Ownership

The problems stated above correspond to the finance division of SIMA. However, it is also related with other problems that exist in and around the organization, which are explained in Chapter V. One of the main problems could be attributed to the public ownership of the organization, which main objective is social rather than economic. It is focused on serving the Defense Ministry and the Peruvian Navy.

In this way, the production capacity during the last years, which was directly influenced by Ollanta Humala's government, has been used to serve the public sector. This left little time to carry out private orders. The government and other public institutions are caught up with the social role of SIMA, causing them to miss economic opportunities. Furthermore, the possibility of generating a higher profitability would also positively influence their social impact, which is explained in Chapter VII.

Chapter III: Literature Review

3.1 Literature Mapping

Today, most developed economies are based on opened markets and private organizations. However, in many countries, especially in emerging economies, state-owned enterprises still play an important role over GDP, employment and capitalization (Organization for Economic Co-operation and Development, 2015). Most of the studies that are reviewed in this section demonstrate that privatization improves firms' financial and operating performance. Nevertheless, government's ownership could be convenient in specific cases.

The following section analyzes the literature related to state-owned enterprises (SOEs) as SIMA. Figure 9 presents a synopsis of the topics and literature that are covered in this chapter. The themes discussed in this section are: definitions, rationale behind SOEs, trends, corporate governance, SOEs' scorecard, SOEs' failure, effects of ownership structure and privatization critics. The chapter begins by defining some concepts, followed by the rationale behind government enterprises and global trends and statistics related to public and private companies. Then, as corporate governance is a critical point on SOEs' management, the challenges related to this topic are covered, followed by some guidelines of the Organization for Economic Co-operation and Development (OECD) which are internationally agreed standards for and efficient and transparent operation of SOEs.

Moreover, since SOEs have multiple goals beyond financial ratios, new measurement models are presented. They all include additional KPIs such as social, human, innovation, citizen and welfare, and environmental indicators. In addition, there are explained some of the reasons why SOEs have declined during the last decades.

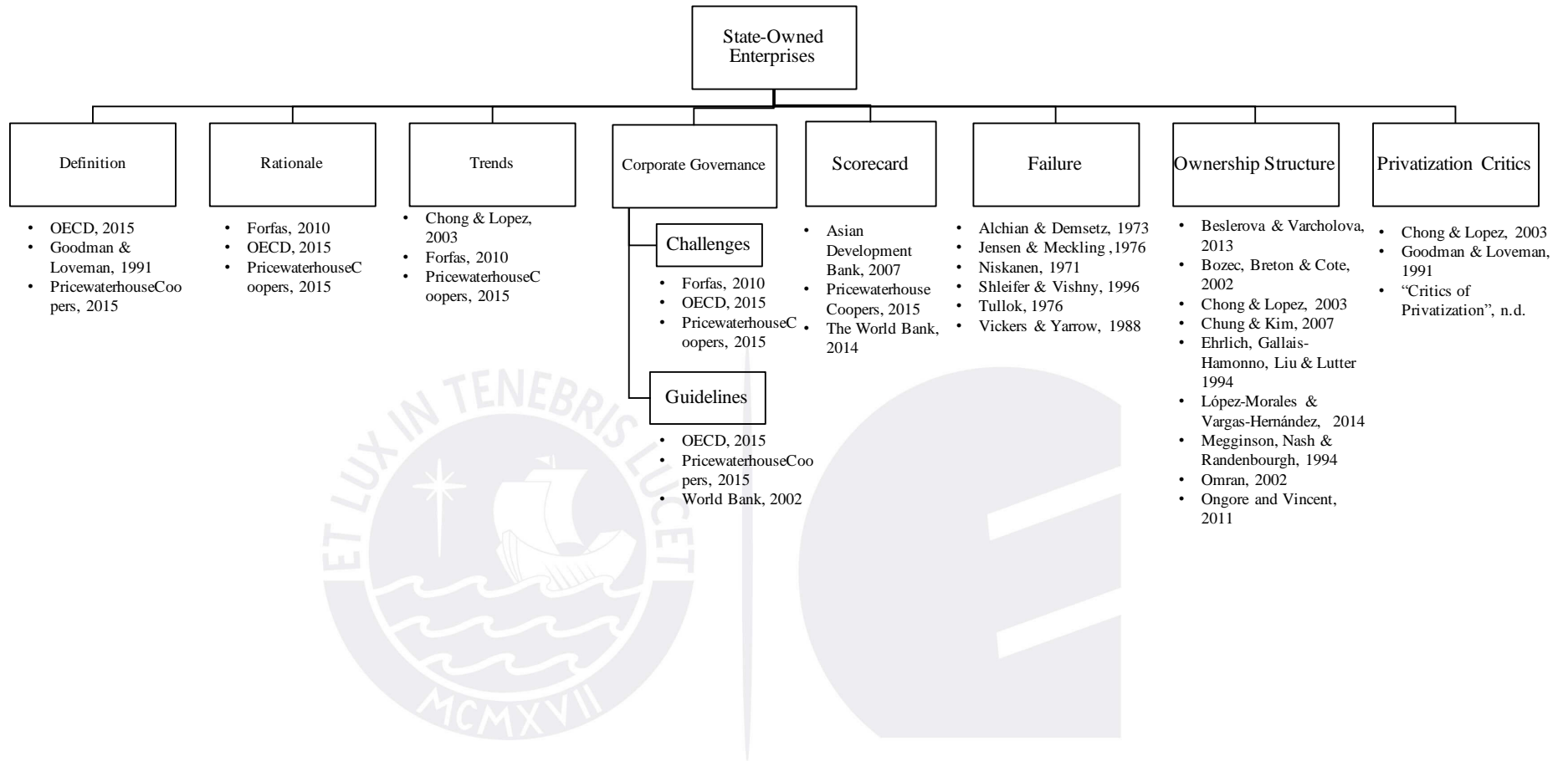


Figure 9. Literature mapping.

3.2 Literature Review

3.2.1 Definitions

The definition of state-owned enterprises differs across countries. The Guidelines of Corporate Governance of SOE's define them as "any corporate entity recognized by national law as an enterprise, and in which the state exercises ownership" (Organization for Economic Co-operation and Development, 2015). They are also known as government's corporations, government's business enterprises, state linked companies, parastatals, public enterprises and so on (PricewaterhouseCoopers, 2015). It includes joint stock companies, limited liability companies and partnerships limited by shares, which means that the state can share the ownership with a private entity (Organization for Economic Co-operation and Development, 2015).

In the other hand, a private company is a firm whose ownership is private and *privatized firms* refer to previously state-controlled companies where private owners presently have control and the level of state ownership is reduced (Beslerova & Varcholova, 2013). Privatization however, includes a great range of activities such as the sale of public assets to private owners, the simple cessation of government programs, contracting out to private firms' services formerly provided by state organizations, and the entry of private producers into markets that were formerly public monopolies (Goodman & Loveman, 1991).

3.2.2 Rationale behind SOEs

During the mid 1950's SOE's became popular in many nations due to the economy situation and nature of many industries (Chong & Lopez, 2003). The rationale of government enterprises corresponds to a mix of social, economic and strategic interests. The ultimate purpose of SOE'S is to maximize the value for society, through and efficient allocation of resources (PricewaterhouseCoopers, 2015). Some of the rationales include:

- Provide public and merit goods such as national defense, public parks, health and education, which benefit the entire society (PricewaterhouseCoopers, 2015).
- Job creation and improvement of labor relations in “strategic” sectors (PricewaterhouseCoopers, 2015).
- Increase access to public services. In some circumstances the private sector refuses to serve less desirable customers. In this situations the state intervention is justified by creating a public company and providing subsidies to reduce the prices of basic services and goods (Forfas, 2010).
- Control of abuse in natural monopolies. Some industries are natural monopolies since entry barriers are extremely high (railways, water and electricity). In such circumstances, suppliers can abuse from their position by charging high prices. In this situations governments could opt for SOEs in order to eliminate the abuse and charge rational prices (Forfas, 2010).
- Eliminate capital market failures. When the private sector is unable or unwilling to finance projects with high returns in the long-term but high risks in the short-term, the state funds this projects by creating joint ventures. However, the presence of more advanced capital markets is reducing the need for public funding (Forfas, 2010).

It is of extremely importance to review the rationale behind the SOEs and consider whether a more efficient allocation of resources to benefit the society could be achieved through an alternative ownership or taxation structure (Organization for Economic Co-operation and Development, 2015). Some countries have established procedures to review these issues periodically, the German budget law is a clear example. It requires the government to review the arguments for state ownership every two years. If the arguments are rejected in the budget bill, then the SOE is automatically privatized (Forfas, 2010). The

following value creation/profitability matrix provides a framework for state's decisions over SOE's ownership (PricewaterhouseCoopers, 2015). In the quadrants with societal value deterioration the state should opt whether to close or sale the company or re-formulate the SOE mission with a societal value adding activity.

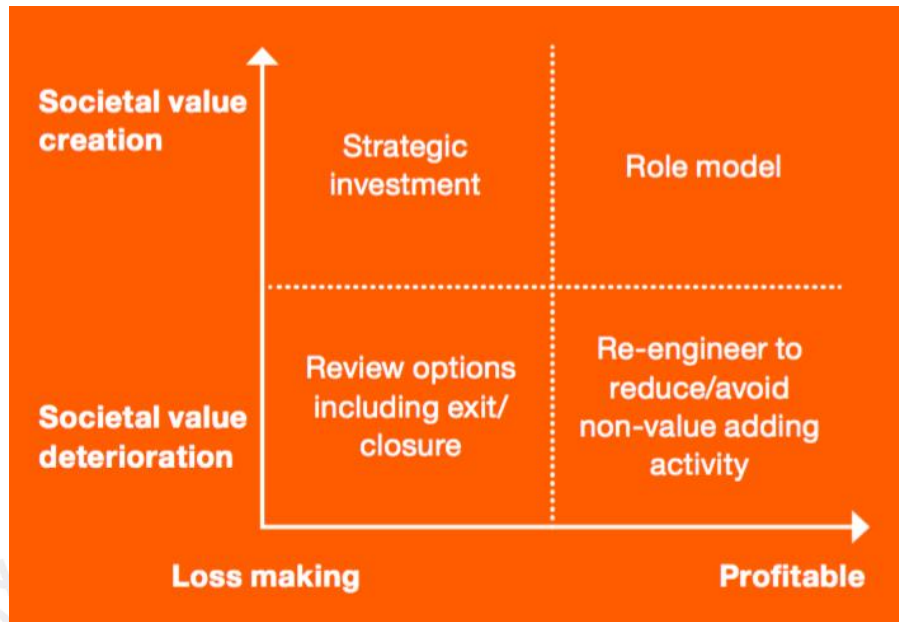


Figure 10. Value creation/profitability matrix.

Data are from “State-Owned Enterprises Catalysts for public value creation?”, PricewaterhouseCoopers, 2015 (<https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>).

China has a particular history of SOEs. After the long period of war that precedes the establishment of The People's Republic of China in 1949, SOEs were created to rebuild the country. They provided not only employment, but also social services, education and healthcare. However, ever since the economic reform and opening up policies from 1978, China has overcome a privatization transformation. The number of SOEs fell from 196 in 2003 to 115 in 2013 (Gang & Hope, 2013).

Nevertheless, China's main SOEs in strategic industries continue playing an important role in the internal and international market. Many global partners have complained about the unfair competition originated by policies favoring SOEs. Some of them are justified such as the argument that SOEs enjoy preferential treatment in licensing and

obtaining government's public contracts. However, they do not have preferential financing and they compete aggressively in competitive markets. "In May 2012, China committed to developing a market environment of fair competition and treating all enterprises without discrimination" (Gang & Hope, 2013)

3.2.3 SOEs' Trends

Although SOEs gained great popularity during the 1950's the public ownership of commercial enterprises has declined since the end of the 20th century (Forfas, 2010). The entire world has embraced privatization after the poor performance, inefficiency and failure of state-owned enterprises (Chong & Lopez, 2003). Figure 11 shows the decline of public ownership in many OECD countries from 1998 to 2008. It can be noted that in 17 out of 27 countries the state ownership has been reducing its participation, five countries have maintained it and only six countries have increased it.

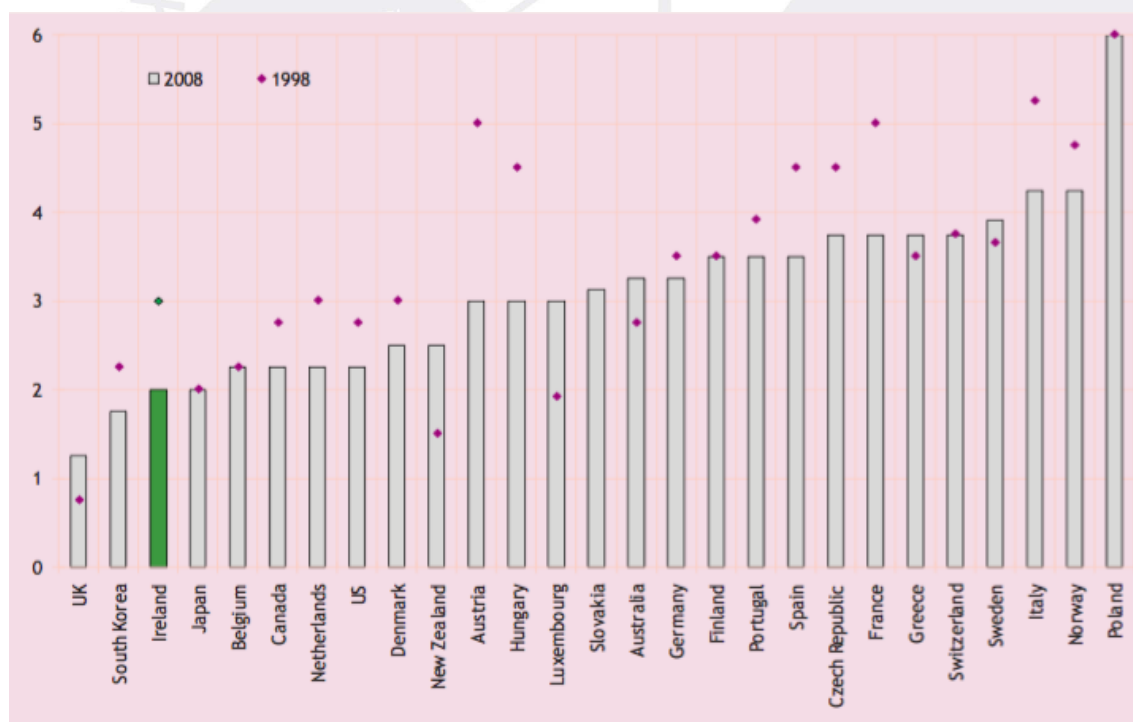


Figure 11. Scope of public ownership index 2008 (Scale 0-6).

Data are from "The Role of State Owned Enterprises: Providing infrastructure and Supporting Economic Recovery", Forfas, 2010

(<http://www.forfas.ie/publication/search.jsp?tp=Infrastructure>)

Despite the downward trend of SOEs around the world, state ownership has been rising in influence over the past decade. This can be noted in the proportion of SOEs among the Fortune Globe 500, which has grown from 9% in 2005 to 23% in 2014. It has mainly been driven by the increasing presence of Chinese SOEs in the top rankings.

In fact, there are three Chinese companies that have reached the top ten since 2010: Sinopec Group, China National Petroleum and State Grid (PricewaterhouseCoopers, 2015). Figure 12 shows the participation of Chinese and the rest of the world's SOEs in the Fortune 500 companies. It can be noted a growing trend of SOEs in terms of quantity and total revenues.

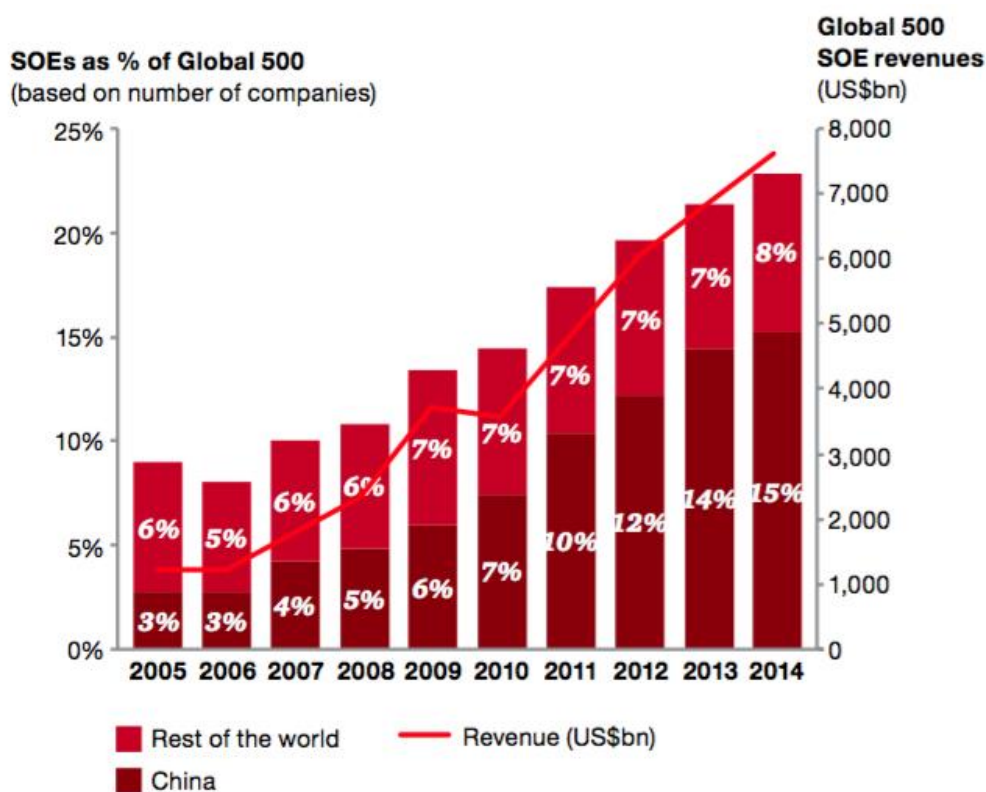


Figure 12. SOEs in the Fortune Global 500, % and Revenues. Data are from “The Role of State Owned Enterprises: Providing infrastructure and Supporting Economic Recovery”, Forfas, 2010 (<http://www.forfas.ie/publication/search.jsp?tp=Infrastructure>).

SOEs are usually concentrated in public services and strategic industries such as petroleum refining, utilities and financial services. On the contrary, few countries have

government presence in competitive industrial sectors such as manufacturing, construction and retail. However, it is interesting to observe some SOEs' emerging sectors such as motor vehicles and parts, telecommunications, mail, aerospace and defense. Figure 13 shows the distribution of SOE's across economy sectors in Fortune Global 500 companies. The sectors that have increased its presence during the last ten years are mining, energy, engineering and insurance.

Another important trend of SOEs is that they have become global companies. The increased international competition for finance, talent and resources have positioned SOEs as tools to compete in the global economy. For instance, those countries with the highest SOEs' shares (China, United Arab Emirates, Russia, Indonesia, Malaysia, Saudi Arabia, India and Brazil) have become important traders, representing together more than 20% of the global trade (PricewaterhouseCoopers, 2015).

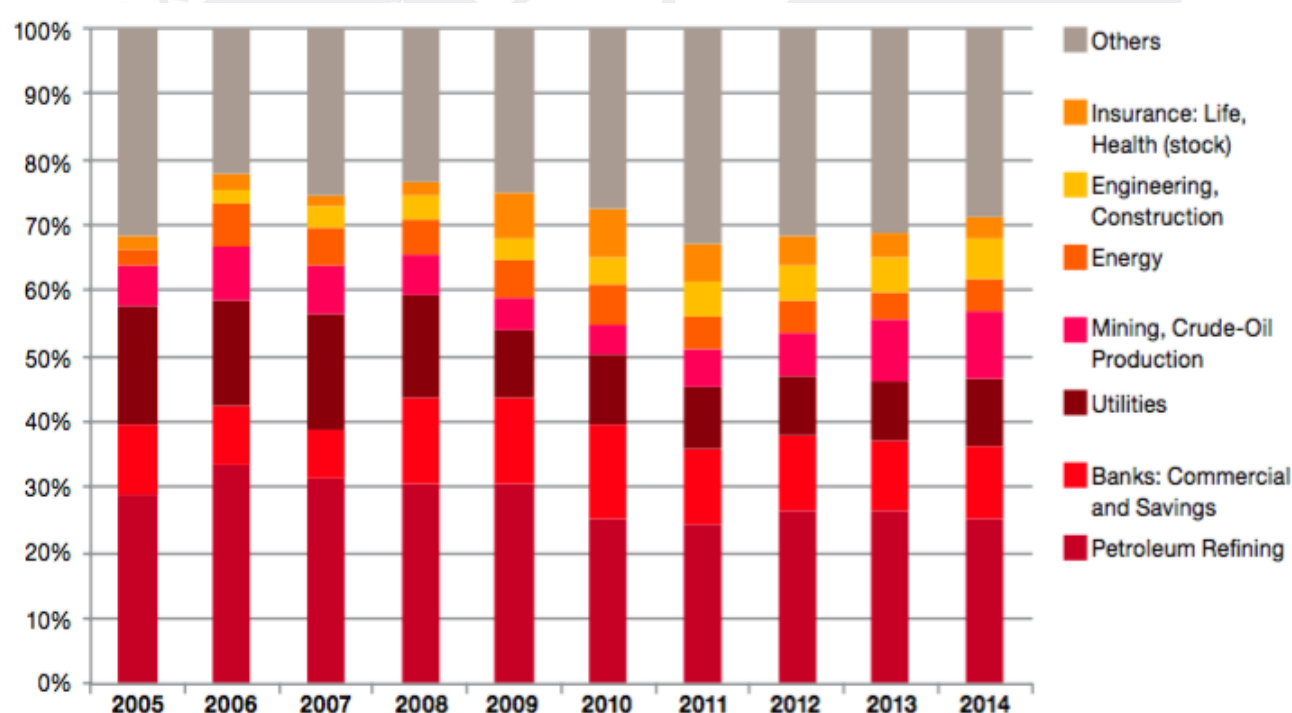


Figure 13. Distribution of SOE across economy sectors in Fortune Global 500. Data are from “State-Owned Enterprises Catalysts for public value creation?”, PricewaterhouseCoopers, 2015 (<https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>).

3.2.4 Corporate governance

SOEs' challenges. Some common challenges faced by SOE are related with governance. State interference is one of the most recurrent problems, together with unclear lines of responsibility and lack of accountability. On the contrary, some cases are related with distant ownership by the state that leads SOE managers to self-serving behaviors instead of serving the best interest of the society (Organization for Economic Co-operation and Development, 2015). Additionally, some other issues found at SOE's governance are corruption, bribery and inefficiency (PricewaterhouseCoopers, 2015).

Another important challenge is to fulfill its multiple and conflictive goals: the financial objectives and the public policy role (Forfas, 2010). The differences between the public and private sector lie in the motivations and objectives of these organizations. While the private sector uses their business activities to achieve financial objectives, the public sector uses finances as a mean to achieve social objectives. In other words, SOEs need to remain financially sustainable and commercially competitive to create value for the society (PricewaterhouseCoopers, 2015).

Guidelines on corporate governance of SOEs. In order to maximize value creation SOEs should follow some guidelines and principles. *The OECD Guidelines on Corporate Governance* of SOEs are internationally agreed standards for governments to ensure that SOEs operate efficiently, transparently and in an accountable manner (Organization for Economic Co-operation and Development, 2015). The term *corporate governance* has been defined as "organization and rules that affect expectations about the exercise of control of resources in firms" (World Bank Development Report as cited in Beslerova & Varcholova, 2013). In public companies conflict of interest and difficulties arise, being necessary to follow guidelines and systems to handle these problems.

The first principle is to establish a clear purpose and mission, linked with the desired social and economic objectives. It should be communicated to the whole organization. Second, key positions such as the board of directors and top managers should comply with the “4C’s” which stands for: clarity, capacity, capability and commitment to integrity”. Third, transparency and accountability are required, through the publication of financial and other performance indicators. Fourth, it is important to co-create value with other stakeholders in society (universities, public sector, NGO’s, citizens) who could provide guidance and inputs on the direction of the SOE (PricewaterhouseCoopers, 2015).

It is also important to clarify the state’s role over SOEs’ operations. The government should participate actively, ensuring transparency and accountability on the governance of the SOE. In this line, the state should simplify and standardize the SOEs’ corporate norms. However, the state should guarantee the full operational autonomy of public organizations avoiding interventions in the SOEs’ management. The board of direction should be the responsible of the SOEs’ operations. This does not mean that the government should not have decision power, but that its authority should be limited to strategic issues and public policy objectives (Organization for Economic Co-operation and Development, 2015).

Additionally, the ownership of SOEs should be centralized in a single entity that supervises the whole range of public companies. It should be clearly identified to a specific ministry or a separate administrative entity. Finally, it is important to clarify the codes of ethic for state officials serving as SOE board members (Organization for Economic Co-operation and Development, 2015).

3.2.5 SOEs' performance

Measuring an organization's performance is necessary and vital. The purpose is not only to know how a firm is performing but also determine how to improve indicators (Asian Development Bank, 2007). *Performance-monitoring systems* refers to institutions, processes and documents that are used by governments to control the financial and non-financial performance of SOEs. This system involves three key elements: (a) setting strategies and objectives, (b) structuring performance agreements between SOEs and governments and (c) developing key performance indicators and targets (The World Bank, 2014).

Traditional systems measure performance using financial indicators such as revenue growth and profitability (Asian Development Bank, 2007). However, it is important to note that since SOEs have multiple objectives, its performance should be measured with additional KPIs beyond financial. The total impact measurement management (TIMM) framework developed by PricewaterhouseCoopers (2015), is a useful tool that could be used to identify the value creation of the social, environmental, social and economic activities of a company. This framework is presented in Figure 14.

The balance scorecard (BSC) is the most widely adopted system today (Asian Development Bank, 2007). Unlike traditional performance systems, the BSC includes different KPIs such as social, human, innovation, citizen and welfare, and environmental capitals (PricewaterhouseCoopers, 2015). Governments could either design a BSC for the country's entire SOE sector or stimulate each SOE to design specific BSCs (Asian Development Bank, 2007). Figure 15 shows the dimensions that should be captured in an SOE's scorecard.

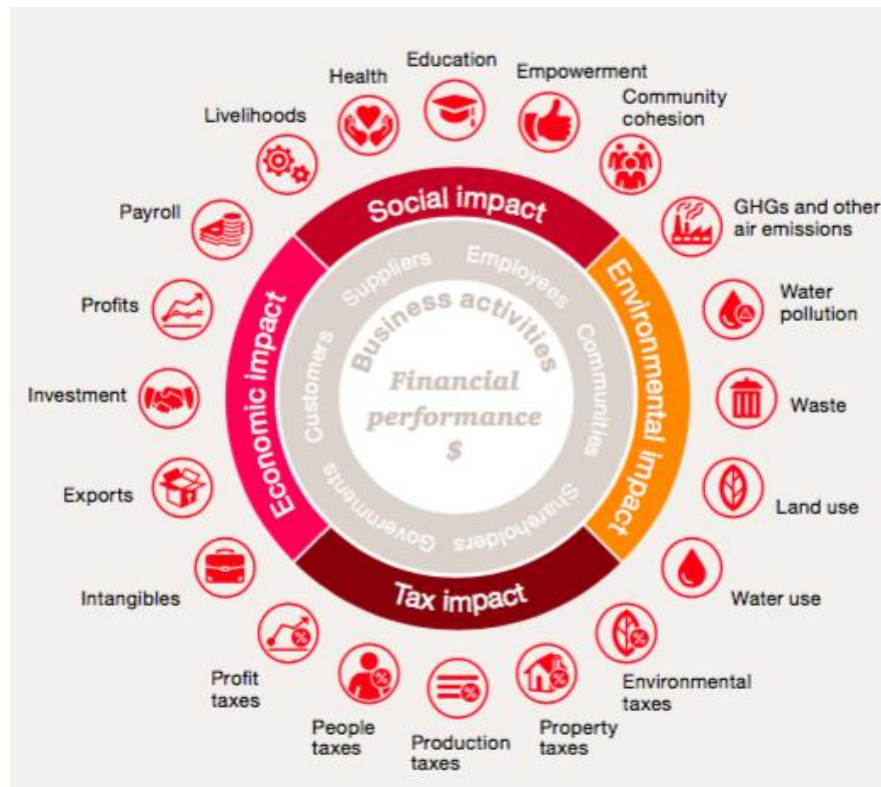


Figure 14. The total impact measurement management framework. Data are from “State-Owned Enterprises Catalysts for public value creation?”, PricewaterhouseCoopers, 2015 (<https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>).

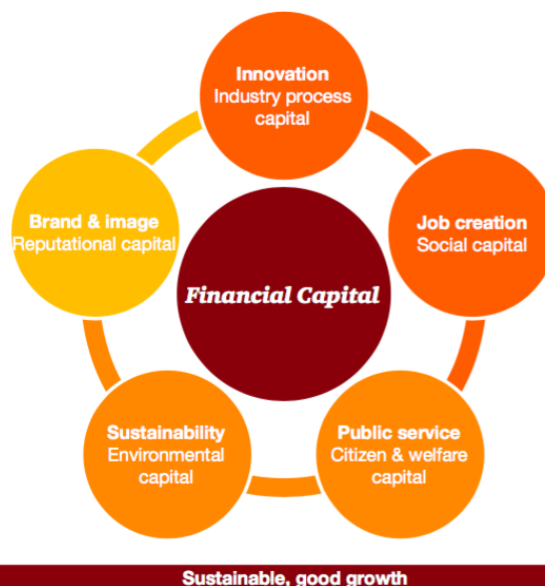


Figure 15. Scorecard dimensions. Data are from “State-Owned Enterprises Catalysts for public value creation?”, PricewaterhouseCoopers, 2015 (<https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>).

3.2.6 SOEs' failure

The literature talks about two principal reasons of state ownership failure. First, the incorrect monitoring and poor incentives for SOEs' managers that is related with the lack of control of financial entities and stock holders since the state is the owner and lender of SOEs. Additionally, the board of directors take most decisions based on political rather than market forces (Vickers & Yarrow, 1988). The second issue is related to the political interference over the firm's production, which results in excessive employment, inefficient investment and poor quality (Shleifer & Vishny, 1996).

Bozec, Breton and Cote (2002, pp. 383-405) summarized three theories that support privatization of public companies: (a) property rights theory (by Alchian & Demsetz, 1973), (b) public choice (by Niskanen, 1971; Tullok, 1976) and (c) agency theory (by Jensen & Meckling, 1976). The first theory argues that under state ownership, property rights are poorly determined and there is no bankruptcy threat. As SOEs' managers are not constraint by these type of controls, they are less inclined to maximize profits.

The public choice theorists talked about the problems in government administration arguing that "managers of the state-owned firms are more concerned to maximize their own power, their prestige and the amount of resources under their control, while the politicians, members of the government care more about re-election than for monitoring the managers of the public firm". Finally, the agency theory states that managers have a conflict of interest since they look for maximizing their own advantage, different from a business owner or a private firm manager who is disciplined by outside and inside control systems.

3.2.7 Ownership structure

Different authors have studied how differences in ownership structure could affect the financial and operating performance of the firm. In other words, they compare the performance of SOEs against privatized firms. There is a generalized belief that private

enterprises perform better than public companies since these last ones are perceived as being mismanaged and squandering assets and resources (Bozec et.al, 2002, pp. 383-405).

Most of the studies presented suggest that privatization of state-owned enterprises leads to better performance. Despite the cases of privatization failures, the total record shows that privatization programs lead to increased profitability and productivity, quality improvements and fiscal growth. In the contrary, privatization failures are related to inadequate re-regulation, poor contract design, corruption and high costs of capital (Chong & Lopez, 2003).

Chung and Kim (2007) concluded that the efficiency of private companies is considerably better than that of state-owned enterprises and partially better than privatized enterprises. Ehrlich, Gallais-Hamonno, Liu and Lutter (1994) found productivity differences between SOEs and privatized companies. Their study proved that privatization can increase productivity up to 2% a year and reduce costs by 1.9%. They also found that productivity was not affected by the degree of market competition or state regulation.

Another study performed by Megginson, Nash and Randenbourgh (1994), demonstrated that privatization leads to increases in profitability, efficiency, output, employment and payment of dividends. Similarly, Omran (2002) found a significant increase of profitability, efficiency, capital expenditures and dividends that newly privatized firms. However, this last study in contrast to Megginson's et.al (1994), found a decline in employment, debt and risk with privatization.

Some other studies are focused in the effect of ownership structure in transition economies. With the liberation of the economies the share of the private sector in the GDP increased from 60% to 90% (Beslerova & Varcholova, 2013). Ongore and Vincent (2011) performed an investigation in Kenya. Results showed that ownership concentration and government ownership have a significant negative relationship performance. On the other

hand, foreign, private and diffuse ownership had a positive relationship. Nevertheless, a study of Latin American firms performed by López-Morales & Vargas-Hernández (2014) suggested that the type of ownership is not relevant to the financial performance in this context.

However, Bozec et.al (2002, pp. 383-405) argued that these studies are distorted since private and public firms do not have the same goals. They indicated that SOEs have specific mandates, some of them incompatible with economic results and identified in the literature as *non-commercial goals*. They encompass political and social dimensions which sometimes bring extra costs or a reduction of revenues of the firms. The studies that have been mentioned ignore in their calculations the social advantages of SOEs.

Nevertheless, Bozec et.al (2002) realized a study in Canadian companies which included non-commercial goals. Their results suggested that SOEs may have a negative effect on performance when it has specific goals other than profit maximization. Additionally, they discovered that public managers can manage as well as private managers, when they have the same goals. Finally, their results contradicted the property theory, establishing that is not a question of ownership but instead of goals what affects the firm's performance. In this line, the profitability of public companies could be improved without privatization if the goals of the firm are reduced to financial performance.

Another study on the performance of state-owned enterprises by Chung and Kim (2007) illustrates the effects of privatizing pressures over SOEs' efficiency. They performed a comparison between 22 Korean SOEs between different periods, one under privatization pressure (1998-2002) and the other period without a government pressure. They found a significant relationship between the privatization pressure and the operating efficiency of SOEs. For instance, during the period 1998-2002 where the government imposed tighter fiscal control on SOEs while implementing a privatization program, efficiency increased in

these organizations. However, the degree of improvement by pressure was smaller than that of already privatized companies.

3.2.8 Privatization critics

There are several theories against privatization. Critics are based in the belief that gains in privatized firm's profitability are achieved at the expense of the society. Goodman and Loveman (1991) argue that private ownership does not necessarily translate into improved efficiency. He added that private sector managers may have no remorse on making essential services unaffordable or unavailable if they lead to higher profits. Therefore, privatization would just be effective if private managers have the incentives to act in the public interest.

Chong and Lopez (2003) argued that profitability gains are obtained from the losses of other actors: (a) from the society through the use of market power, (b) from workers by means of lower salaries, and (c) from the government. However, empirical evidence presented by the same study contradicts such arguments. First, the abuse of market power has been rejected by data from Latin America, which shows that changes in profitability are generally larger in competitive rather than non-competitive sectors. In Mexico, operating margins from privatized firms in competitive sectors increased in 14.5% and only 8.5% for non-competitive industries. Similarly, non-competitive sectors in Peru increased their profitability in an average of 27% while the mean of the whole sample was 32%.

Another important argument is that when privatizing firms, governments lose the firm's profitability and put it in hands of private firms. Nevertheless, there is also empirical evidence that shows that SOEs are less efficient than private firms and that privatization leads to profitability increases (Shleifer & Vishny, as stated in Chong & Lopez, 2003). Moreover, tax collection from SOEs actually increased after privatization in most Latin American

countries (Chong & Lopez, 2003).

However, worker exploitation critics have not been disregarded. First, it is important to note that labor cost reductions are caused by fewer workers or lower wages. Some studies shown in Chong and Lopez (2003) confirm that employment costs fell between 20% to 30% after privatizations in Latin America, which are mainly related to layoffs. However, the same study demonstrates that industry wages usually increase after privatizations, by about 100% in Mexico and Peru.

Furthermore, some economists agree that it is the quality of the state rather than the fact that assets are owned by the state that matters. In developing countries, characterized by market and information failures, the state should play an important role in promoting long-term development. Therefore, in many developing countries, privatization has resulted in weakening the government without a strengthened private sector. Moreover, privatization has negatively affected labor markets and consumers, expressed in higher prices and on the exclusion of large segments of the population (“Critics of Privatization”, n.d.).

3.3 Conclusions

Although SOEs gained great popularity during 1950's the public ownership of commercial enterprises has declined since the end of the 20th century. Most economies have embraced privatization after the poor performance, inefficiency and failure of state-owned enterprises. However, SOEs have been rising in influence, increasing its participation among the Fortune Globe 500.

Despite SOEs' criticism, government's ownership could be convenient in specific cases: to provide public and merit goods, to eliminate monopolies and market failures and to create jobs and have a direct management over strategic industries. In addition, governments should review continuously, the rationale behind SOEs and consider whether a more efficient allocation of resources to benefit the society could be achieved through an alternative

ownership. Also, since SOEs have multiple objectives its performance should be measured within a new scorecard with additional KPIs beyond financial ratios such as social, human, innovation, citizen and welfare, and environmental capitals.

Good governance is also critical to ensure their positive performance and expected contribution to their economies. The OECD Guidelines on Corporate Governance of SOEs are internationally agreed standards that could lead governments to an efficient and transparent administration of SOEs. Some of the principles are: to establish a clear purpose and mission, to ensure transparency and accountability and to clarify the role of the state over the SOEs' operations. The state should guarantee the full operational autonomy of public organizations avoiding interventions in the SOEs' management.

Finally, different authors have studied how differences in ownership structure can affect the financial and operating performance of the firm. Overall, the total record shows that privatization programs lead to increases profitability and productivity, quality improvements and fiscal growth. However, studies are distorted since private and public firms do not have the same goals. Bozec et.al study concluded that public managers can manage as well as private managers when they have the same goals and that it is not the difference in ownership but the difference in goals what affects the firm's performance.

The literature review has provided valuable insights related to SIMA's financial problem. First, it has been mentioned the extremely importance of reviewing the rationale behind SOEs. It was stated that products and services related to national defense are considered strategic industries. Also, since shipbuilding is labor intensive it provides numerous job positions. Therefore, SIMA's state ownership responds to social and strategic interests. From this, it can be argued that SIMA should remain as a public company to have a better control of a strategic industry and maintain its social role.

Second, it was discussed that SOEs have both financial objectives and a public role. Therefore, it needs to remain financially sustainable and commercially competitive to create value for the society. This idea suggests that a significant part of SIMA´s capacity should be advocated to the private sector in order to generate profits. This is the only way that the firm remains competitive by investing in infrastructure, technology and R&D.



Chapter IV: Qualitative/Quantitative Analysis

4.1 Qualitative Analysis

As shown in Chapter II, SIMA has been generating small profits during the last ten years. Even though net margins have recently improved (see Appendix A), they are too small to perform the long-term investments that are required. SIMA's actual capacity does not allow them to attend private clients since it is all taken by government's projects. It was also mentioned in Chapter III that the firm needs to remain financially sustainable to continue with its operations and that the only way of creating profits is by serving private orders. Therefore, SIMA needs to increase its capacity to be able to serve the private sector.

Likewise, it has been mentioned in the internal analysis that the firm's infrastructure and equipment are obsolete and outdated. Therefore, SIMA needs to invest in new technologies and infrastructure if they intend to remain commercially competitive. Their local competition in Chile and Panama are generating competitive advantages by having the latest technologies. This would not only increase its competitiveness but also its productivity.

There are other minor problems located around the company that could be affecting its financial indicators. It was mentioned that the company lacks from human resources, procurement and financial policies. The first one is affecting motivation levels and productivity, the second causes delays and bottlenecks on production and the last one increases the firm's financial risk and supplier's prices. As it is known, productivity, and bottlenecks have a direct relationship with financial losses.

4.2 Quantitative Analysis

In order to determine if SIMA's profit margins are attractive or unattractive, the company profitability ratios have been compared with its competitors: ASMAR (public company) and ACENAV (private) both from Chile, China Huarong Energy Company Limited (private), China Shipbuilding Industry Co. (public) and CSSC (public) from China.

Additionally, the information is also compared with the profitability of the Chinese Shipbuilding Industry in the last five years. The indicators that are compared in Table 6 are: Gross Margin, Operating Margin, Net Margin and ROE.

In the years 2014 and 2015, SIMA obtained a small gross margin, because the majority of sales were made to government entities. Detroit Chile presents that highest margins since it is a private company, which gives an idea of the gross margin that SIMA could obtain if they increase private sales. On the other hand, it can be noted that even China Huarong Energy Company Limited, which is also private, obtained a small gross margin due to price reductions.

The Chinese industry was significantly affected following the financial crisis. Today only 100 out of the 300 Chinese yards have day-to-day operations in comparison to the 3,000 yards in 2010 (“The Good and Bad Outlook”, 2016). China Huarong Energy Company Limited has barely been operating due to shortage of funds and the lack of availability of banking facilities required for accepting new orders. Finally, the group was still carrying high operating expenses and finance costs (China Huarong Energy Company Limited, 2015). On the other hand, CSSC have responded to the declining orders by consolidating its yards and reducing costs (“The Good and Bad Outlook”, 2016).

When analyzing operating margins, it is noted that SIMA obtains negative results in comparison to the positive results of its competitors (with the exception of China Huarong). This suggests that SIMA is not including administrative and sales costs in the price of public projects. Additionally, SIMA obtains positive and similar net margins than those of ASMAR, but lower than Detroit. Chinese companies obtained negative gross margins in the last two years but it is still positive in the evaluation of the last five years. SIMA’s positive net margins are related to financial incomes. Finally, SIMA obtained higher ROE than ASMAR but lower than Detroit. It is important to note that this last company is involved in

shipbuilding, maintenance and repair which represents 65% of its sales; the other 35% corresponds to motor sales.

Table 6

Comparison of Profitability Ratios of SIMA vs Competitors

	SIMA (2015) ^a	SIMA (2014) ^a	ASMAR (2015) ^b	ASMA R (2014) ^b	Detroit Chile SA (2014) ^c	China Huarong Energy Company Limited (2014) ^d	CSIC (2015) ^e	CSSC (2015) ^f	Chinese Industry (5Y) ^f
Gross Margin	2.73%	7.05%	20.01%	16.26%	50.24%	8.19%	5.18%	6.63%	20.13%
Operating Margin	-5.65%	-2.41%	4.58%	0.97%	19.51%	-159%	-7.16%	4.93%	2.71%
Net Margin	2.38%	2.35%	1.75%	3.89%	9.15%	-213%	-4.38%	-0.42%	0.64%
ROE	5.52%	4.55%	0.72%	1.83%	7.7%	-81%	-4.47%	-0.24%	4.55%

^a Servicios Industriales de la Marina (2016, p.65), ^b Astilleros y Maestranzas de la Armada (2016, p.56), ^c Detroit Chile (2015), ^dChina Huarong Energy Company Limited (2015, p. 53), ^e Market Watch, 2016 (<http://www.marketwatch.com/investing/stock/601989/profile>) ^f Fusion Media Limited, 2016 (<http://www.investing.com/equities/cssc-steel-ratios>).

It has been shown that in comparison to other public companies of the industry, SIMA presents similar or superior profits. However, Detroit Chile has shown the potential profits that SIMA could obtain if it increases its capacity to serve private clients. Also, SIMA should avoid negative operating margins by including operating costs in the budget of public projects.

Additionally, it has been shown in Table 6 that the most profitable business unit is repair and maintenance with net margins of 15% in comparison to the 5% of shipbuilding and 8% of metal works. Table 7 presents the distribution of SIMA's sales by business unit. It should be noted that in the last years, SIMA's shipbuilding sales have fallen while its maintenance and repair sales have risen. In the period 2011-2013, SIMA's sales were focused in shipbuilding. However, 2014 and 2015 the repair and maintenance division have been the focus of work.

Table 7

Sales Distribution by Business Unit 2011-2015 (expressed in soles)

Business Unit	2011	2012	2013	2014	2015
Shipbuilding	39%	47%	61%	18%	1%
Repair & Maintenance	33%	36%	22%	51%	77%
Weapons and Electronics	1%	2%	3%	18%	16%
Metal Works	27%	15%	14%	2%	4%
Others	0%	0%	0%	11%	3%

Note. Data are from “Memoria Anual Año 2015” by Servicios Industriales de la Marina (SIMA), 2016, p.42.



Chapter V: Root-Cause Analysis of the Problem

5.1 Identified Causes

In order to analyze the roots of the problem, a fish-bone analysis has been performed. Roots has been detected in different areas of the company: management, workers, working conditions, materials, machines and technology and marketing. The fish-bone analysis is shown in Figure 16.

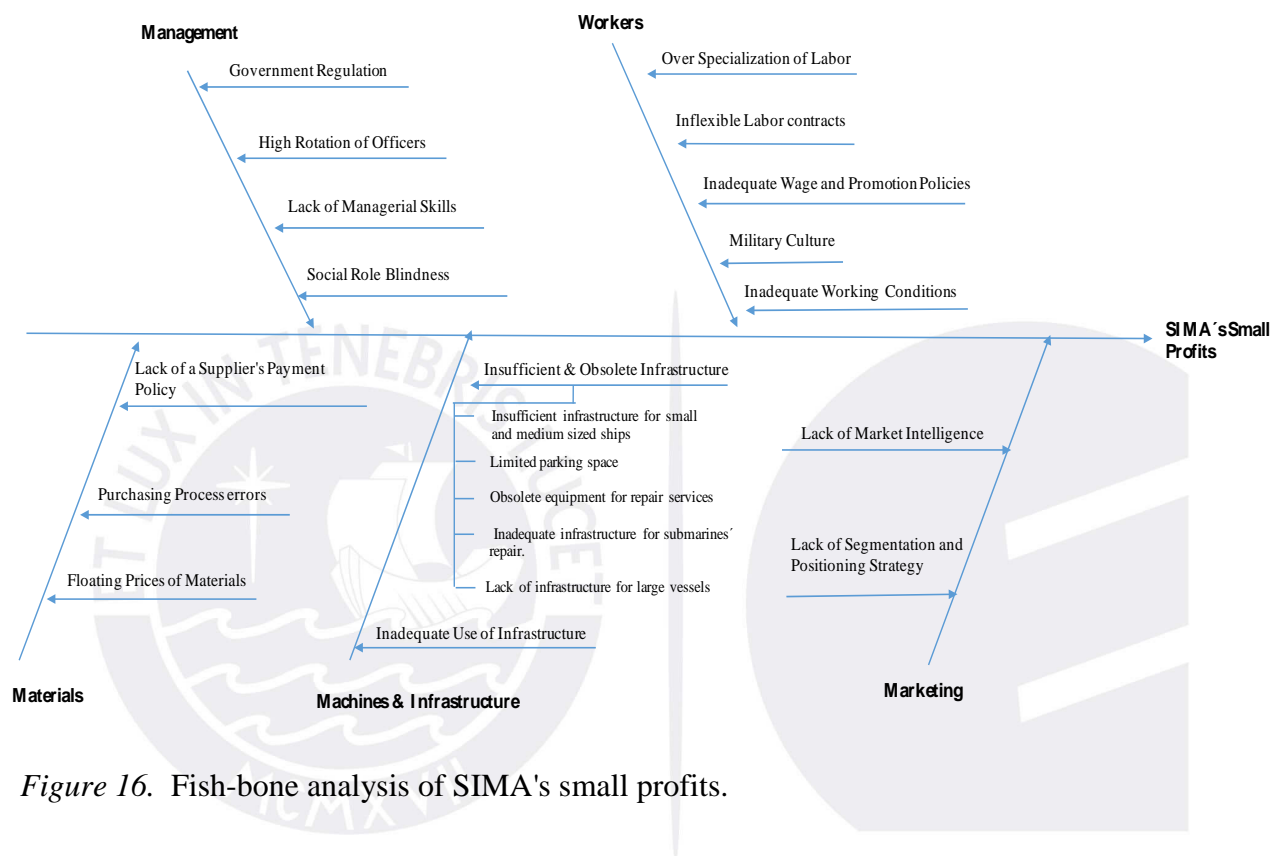


Figure 16. Fish-bone analysis of SIMA's small profits.

5.1.1 Management

Government-regulated. As stated before, SIMA is a public company with private administration. It has administrative, technical, economic and financial autonomy, managed by the board of directors. However, it is regulated by the Defense Ministry and the National Financing Funds of Public Companies (FONAFE). The first one is their most important client (stakeholder) and the second one a stockholder (Servicios Industriales de la Marina, 2008a).

As SIMA's main objective is to serve the Peruvian Navy and due to the small capacity, in continuous occasions SIMA has been forced to reject or stop private projects to

work for the Peruvian Navy. Therefore, it is difficult for SIMA to create long-term relationships with private clients and this situation has created a negative reputation for the firm (Novoa, personal communication, July 21, 2016).

High turnover of officers. It has been mentioned before that the career progression of marine officers does not allow them to stay in SIMA for more than two years, except for the General Command Specialist officers and other justified cases (Servicios Industriales de la Marina, 2008a). This inhibits, many times, the continuity of stable management, the development and implementation of strategic planning and the establishment of long-term goals. Big projects such as the development of the current shipyard or the creation of a PANAMAX yard are not in their plans since they are only focused in short-term objectives. Additionally, high turnover implies higher costs of hiring and training, and affects productivity and authority levels (Servicios Industriales de la Marina, 2008a).

Lack of managerial skills and vision. SIMA is directed by marine officers of different specialties. Sometimes the skills of the officers meet the required capabilities. However, there are many occasions where there is a lack of managerial and technical skills (Novoa, personal communication, July 21, 2016).

The blindness of their social role. SIMA's main objective is to serve the national government and the Peruvian navy by building ships and other metal infrastructure and giving maintenance and repair services. However, SIMA's private administration allows them to serve private clients. It has been explained that public projects do not generate profits and among the private businesses, ship maintenance and ship repair are the most profitable. However, private orders are just carried out when their public contracts are not in demand. This prevents SIMA from working with private clients and as explained before, this affects the reputation of the company for rejecting orders.

It is believed that SIMA's economic role is not opposite but complementary to its social role. If SIMA increases its capacity in order to serve private clients, the company will be able to generate profits and reinvest them in R&D and technology, increasing SIMA's competitiveness. Additionally, the increasing demand will generate more jobs, and further contribute to their goal of positive social impact.

5.1.2 Workers

Over specialization of labor. One of SIMA's labor problems is that employees are over specialized in one function. In several occasions the firm had tried to assign employees to different functions according to the demand with negative results. SIMA needs to hire multifunctional workers or train their labor force in different activities to achieve a higher flexibility and productivity (Novoa, personal communication, July 21, 2016).

Inflexible labor contracts. One of the social objectives of SIMA is to generate job positions. Since shipbuilding, maintenance, repair and metal works are labour intensive activities, SIMA employs more than 2,500 workers between their three locations. In the past the company had employed larger labor forces of more than 5,000 workers. However, due to its social role, the firm avoids firing workers even during slow business periods (Novoa, personal communication, July 21, 2016).

Inadequate wage and promotion policies. SIMA does not has an adequate wage and promotion policies that recognizes efficacy and efficiency. The lack of formal indicators and the fact that bonuses are given to some employees without a common understanding, creates a feeling of injustice among the workers. Promotions and bonuses are given based on employees' loyalty, experience and seniority. They do not consider other indicators such as productivity and competencies to measure their performance. In addition, the low wages have generated an outflow of talent to competitors' firms (Servicios Industriales de la Marina, 2008a).

Military commands. Since the firm is directed by marine officers, the company works by military commands. Workers are used to receiving and following orders. They are not encouraged to think creatively to find solutions and new opportunities (Servicios Industriales de la Marina, 2008a).

Inadequate working conditions. The deteriorating conditions in which services are provided could affect the motivation of workers, and this could, for example, affect the final service given to the client in their work (Novoa, 2012).

5.1.4 Materials

Lack of a supplier's payment policy. SIMA does not counts on a supplier's payment policy, which means that they are not guaranteed payments for their contracts. This has forced the company to deal with smaller suppliers who are usually more expensive. Additionally, because of this payment policy, SIMA often faces several problems with suppliers such as: delays, delivery failures, quality issues and quotation errors. Additionally, international purchases are performed by bank transfers without letters of credits or any other financial instrument to protect and guarantee the contract. In this way, SIMA takes the risk of losing the money if suppliers go out of business (Servicios Industriales de la Marina, 2008a).

Purchasing process errors. The purchasing department does not always program the orders in advance, and this generates production delays and bottlenecks. Also, the purchasing documents usually contain errors, causing delays and re-processing of orders (Servicios Industriales de la Marina, 2008a). It is necessary to train this division and implement indicators to measure the performance.

Floating price of materials. Shipbuilding is highly dependent on the price of its main material: steel. Other important materials include copper, aluminium, zinc and nickel. Steel plates are imported from China, the world's leader of the steel market, representing more than 46% of the total production (Gilberg, 2012). Before 2012 steel prices had been increasing;

however, in the last years its price has been falling from 4,000 CNY/Metric Ton in 2012 to 2,000 CNY/Metric Ton in 2015 (Evans-Pritchard, 2015). Even though SIMA has benefited from the falling prices, the last years' fluctuation can turn again and the material prices can rise in the future.

5.1.5 Machines and Infrastructure

Insufficient and obsolete infrastructure

Insufficient infrastructure for dry work of small and medium sized ships. There is a tendency of the national fishing fleet to use more and larger vessels. However, the existing capacity is limiting SIMA to serve the business demand, especially during fishing off seasons, when ships take advantage of the free time to carry out their maintenance services (Novoa, 2012). The existing infrastructure has a limited capacity. It consists in one dry dock and three floating docks that can serve up to seven small ships at the time (Novoa, 2012).

However, SIMA is already building a new shipyard, and the first phase will be inaugurated in February 2017. This new shipyard will be able to serve four more ships and one submarine at a time. The rest of the project is expected to be completed in two years, increasing the capacity to working on 17 ships simultaneously. This new yard will also use an elevator that will allow to access the 17 ships (Novoa, personal communication, July 21, 2016).

Limited parking space. This issue is contemplated in the new shipyard, which counts with enough parking to work 17 ships at the same time (Novoa, personal communication, July 21, 2016).

Obsolete equipment for shipbuilding and repairs. The current equipment used for electricity, compressed air, gases, water do not allow the installation of new equipment to increase its capacity (Novoa, 2012). Also, SIMA counts with an adequate software for the design of small boats. However, the software used for the design of large vessels and naval

engineering is obsolete, limiting the competitiveness of SIMA in the shipbuilding business (Servicios Industriales de la Marina, 2008a).

Additionally, the largest shipyards in the world have automated processes. Their production lines employ modular construction systems in dry docks equipped with overhead cranes of large capacity, intelligent systems and robotics. This saves time, costs and improves productivity (Servicios Industriales de la Marina, 2008a).

Inadequate infrastructure and equipment for submarine repair. The current division does not have adequate equipment to perform submarine repairs such as bridge cranes, cutting equipment, high-performance compressors and specialized equipment. Additionally, the current infrastructure cannot service adequately the Angamos 209 submarine type, which constitutes the first line of defense of the country. These submarines have been in use for more than 30 years, and are in urgent need of repair. Finally, the submarine repairs have not turned a profit for the company in the last 12 months in comparison to the ship maintenance (Novoa, 2012).

Lack of infrastructure for the attention of large vessels. Nowadays, the ships crossing the Panama channel have grown in length to the extent that the Panamax ships cannot enter the SIMA dry dock (Novoa, 2012). So they are currently evaluating the possibility of building a Panamax dock, which would represent a high investment. However, it would open up the shipping hub in Callao to potentially becoming a much more competitive service location (Novoa, personal communication, July 21, 2016).

Inadequate use of infrastructure. Dry docks are used to repair ships of low and medium board. They do not have the ability to conduct and develop business with large sized vessels. Although this dock can receive ships of smaller size, when this is done, the income does not cover the costs. So this is a point SIMA needs to pay careful attention to avoid losing revenues (Novoa, 2012). Clients must wait for service outside the harbor, creating

bottlenecks if any ship service is concluded before or after the others. The size of the port always causes traffics problems for the incoming and outgoing vessels (Novoa, 2012).

The lack of infrastructure and capacity present the following problems. First there is not a sufficient capacity for small and medium sized ship for repairs and maintenance. Second, the lack of ability to perform services for large vessels and submarines is a reoccurring problem. These problems force SIMA to delay service attention and even reject potential clients.

The consumer response to these service problems has been diverse. There is a small group of loyal customers who prefers to wait days or even months to be served by SIMA because they value the quality of service. However, they are still unsatisfied by the waiting times. Another group looks for other shipyards when SIMA is full and they come back when they find free capacity. However, there is group of clients who will not seek SIMA's services again once they are rejected. Appendix 2 shows these numbers. In 2011, more than 60 ships were rejected due to capacity issues.

5.1.6 Marketing

Lack of market intelligence. The social role and the blindness of SIMA to see economic opportunities is holding them back. The company is used to receiving projects from the government without a commercial or marketing division ever proactively seeking out work and securing new contracts. For instance, since the company has not had the need of looking for private clients and compete with international firms, SIMA has not developed any sort of market intelligence. Now that they have more space to work on vessels, SIMA will have extra capacity to serve private clients. Now it is critical that they develop a marketing plan. The company needs to analyze the market and their competitors in order to find the attributes which are most valued by clients and the competitive advantages of their rivals.

Lack of segmentation and positioning strategy. As a result of the poor marketing activities, SIMA has not developed a segmentation, targeting and positioning strategy. It is important that once they identify their competitors and their competitive advantages, SIMA needs to think in what segment they want to compete and what attributes they want to focus on to develop and stand out for. They could compete in cost, location, specialization, time or any other attribute valued by the clients. This formulation will be the basis for the development of the rest of SIMA's marketing plan.

5.2 Main Causes of the Problem

In order to increase profits, the most important measure to take is to shift the focus of their business from shipbuilding to repair and maintenance, which has higher margins. For this reason, it is important to remove the social role from the administration which is causing the company to underperform. Additionally, to be successful in this industry, it is also important to correct the marketing shortages, beginning with a new push for market intelligence with a positioning strategy for SIMA. In this way, the Implementation Section shown in Chapter VIII would develop a market intelligence and positioning strategy for SIMA.

From the other roots presented above, it is important to mention that the company has already started changing their machines and infrastructure, with the expansion of the Callao's shipyard. Additionally, the HR division needs to change some policies and take some actions to work on the management, workers and working conditions roots. Finally, it is also important to establish some purchasing policies to minimize losses in the projects carried out. All these alternatives among others are developed in the following chapter.

Chapter VI: Assessed Solution Alternatives

6.1 Alternatives to Solve the Problem

The solutions have been elaborated based on the different ideas presented in the literature review. As explained before an SOE has different types of impacts and KPIs to be considered: social (job creation, education, payroll and benefits), economic (profits, tax impact), innovation (R&D investment), brand image and environmental. Therefore, different improvements need to be done around the whole organization which are presented in Table 8.

Table 8

Key Problems, Roots, Proposed Solutions

Problem	Area	Roots	Proposed Solutions
	Human Resources	Government regulation	Privatize a branch of the firm
		High turnover of officers	Motivation / Wage and Promotion Policy
		Lack of Managerial Skills	Hire civilians with Business studies
		Social role blindness	Shift focus to repair business
		Over Specialization of Labor	Training in different specialties
		Inflexible labor contracts	Training during slow business periods
		Inadequate wage and promotion policies	Creation of a wage policy based on results and productivity
		Military commands	“Work-out” program
		Inadequate working conditions	Motivation / Improvement of space
SIMA'S Small Profits	Procurement and Finance	Lack of a supplier's payment policy	Creation of policy / Use of financial instruments
		Purchasing process errors	Procurement process manual / Training / New indicators / Automated orders
		Floating prices of materials	Use of financial instruments (options)
	Machines and Infrastructure	Inefficient and obsolete infrastructure	Expansion of shipyard / new docks / acquisition of high tech machines
		Inadequate use of infrastructure	Creation of an infrastructure manual
	Marketing	Lack of market Intelligence	Conduct competitor analysis
		Lack of segmentation and positioning strategy	Creation of positioning strategy

6.1.1 Changes in HR policies

Important changes have to be addressed is in the human resources department. First, the two-year rotation of officers is not ideal for fostering a sustainable change within the company. Marine officers do not have the opportunity to establish a long-term goal. A possible solution for SIMA to overcome these challenges would be to extend the rotation of marine officers offering new opportunities. SIMA should develop new HR policies that allow naval officers to have a long term careers as a manager within the company. By developing a new plan, SIMA will be able to have a stronger and more efficient workforce.

Second, there is a lack of managerial skills among marine officers at SIMA. They do not have degrees in business and lack the necessary managerial and business communication skills. Despite their extensive knowledgeable in the shipping industry, they need to improve their knowledge of the business world. It will be interesting for SIMA to have a business training for those marine officers to increase their performance. The company could also consider the incorporation of skilled professionals (civilians) into the board of directors and managerial positions.

Third, SIMA's current wage and perk offers are not attractive. It is common for public companies to provide lower wages because they are offering secured positions. It is clear that SIMA's current wages are not attractive, and their promotion policy is not fostering efficiency. Employees are being promoted based on seniority, loyalty, and experience. A recommended change for the shipping company to implement is to promote their employees based on their overall productivity and efficiency.

Finally, because of its public sector status, there is a lack of communication between staff and managers at SIMA. Additionally, it is highly hierarchal, and the government of Peru controls processes. Therefore, there is a lack of creativity and innovation. Another possible solution is to create a culture of a small company, where all workers feel engaged and

everyone has a voice. General Electric's (GE) applied this idea through a program called “work-out”. It consisted of sessions where employees were invited to share views about their business and recommendations on how to improve it. Employees did not only have the opportunity to speak their minds but also got immediate responses from their leaders. This zero-cost initiative reduced unnecessary bureaucracy and increased creativity and productivity at GE (Bartlett & Wozny, 2005).

By promoting innovation within its workforce, SIMA will have the possibility to develop new efficient ways of building or repairing ships. In addition, it will improve the motivation of their staff. It is crucial for SIMA to have a strong and loyal workforce that will help the company to strengthen their position within this risky industry.

6.1.2 Changes in procurement and financial policies / practices

As materials are the largest cost, their optimization is not only essential to improve efficiency, but also to increase profitability. First of all, the lack of suppliers' payment policy restricts SIMA to make business with larger firms. As a result, the costs and the risks would increase due to the lack of economies of scale and the high bargaining power of suppliers. One possible solution to fill this gap is to establish a supplier's' payment policy. Certain policies should be implemented to guarantee the whole process of payment. Regarding international purchases, SIMA should use financial instruments such the bill of credit method to guarantee payment and merchandise's delivery.

A manual purchasing process is also needed to avoid delays, bottlenecks, and re-processes. Employee's training should also be carried out to explain the process and avoid mistakes. Additionally, certain indicators should be implemented to examine the performance of the employees. Finally, a procurement system that incorporates suppliers could also be implemented to automatically send purchasing orders when materials reach low stock levels.

Since materials play an important role in the shipbuilding industry, their price directly affects the cost of sales and ultimately the company's profitability. Therefore, SIMA has to implement certain financial instruments to minimize the influence of the fluctuation of the material price. One possible solution to reduce uncertainty is to purchase options. In this way, negative fluctuation of prices would not affect SIMA at the expense of a small amount of premium fees.

6.1.3 Shift of focus for projects

Despite that the social role is a priority, it has been mentioned in Chapter III that that state-owned companies use their finances as a means to achieve social objectives. For instance, SOEs need to remain financially sustainable and commercially competitive to create value for the society. In order to generate higher social impacts, SIMA needs to take more private projects to generate profits. They could be reinvested on increasing its capacity and investing in R&D that would create additional job positions.

Moreover, as mentioned above the shipping industry is one of the most competitive industries in the world and highly globalized. Therefore, it is crucial for companies to develop a strong position within this market. A first possible alternative for SIMA would be to focus their resources more on ship repairs and maintenance. The ship repairs and maintenance market is the most profitable, whereas the shipbuilding market is costly and unattractive. SIMA is currently building a new dry dock that will allow them to work on 17 medium size ships at the same time (>1000 tons) and on vessels up to 2500 tons. This new dry dock is the first step for SIMA to become a leader in ship repair and maintenance.

6.1.4 Privatize a branch of the company

The third option would carry out various extensive changes to the company structure by privatizing the ship repairs and maintenance division of SIMA Callao. The repairs and maintenance is the most the profitable branch of the company. If privatized, it would be much more free to pursue competitive work and dedicate time to growing the business as normal companies do outside the control of the government.

The social impact SIMA Callao has on the local community is deeply felt in Lima with an incredibly positive influence, as mentioned in the first chapter. The local economy is also always greatly affected by the shipyards. France gives us a clear example. Three years ago, the French shipyard in Saint-Nazaire asked the government to nationalize their shipbuilding company. Their request was dismissed as Hollande did “not want another manufacturing failure on his hands” (Boselli, 2013).

For this reason, the company is managed more safely with the stability provided by the government. Although there is the possibility of turning more profits if it were entirely private, but the economic risk of failure is too great. Additionally, it is believed that this alternative would receive high opposition from the government.

6.2 Assessment of Alternatives

In order to assess the best possible solution, the alternatives have been scored (in a 1-3 scale, being 3 the highest) in relation to urgency, suitability, feasibility and acceptability. The most suitable solution is the one that generates the highest impact. Then, feasibility refers to the economic viability of the alternatives. Finally, acceptability makes reference to the position of SIMA´s management regarding the changes. Results are presented in Table 9.

Table 9

Assessment of Solutions

Solutions	Urgency	Suitability (Impact)	Feasibility (\$)	Acceptability	Total
Changes in HR policies	3	1	2	3	9
Changes in Procurement and Finance policies	2	1	3	3	9
Shift of Focus	3	3	3	2	11
Privatize a branch	1	2	3	1	7

Note. 1-3 scale, being 3 the highest score.

The alternative that obtained the highest score is shift of focus (with 11 points), followed by changes in HR policies and changes in procurement (both with 9 points) and finally, privatization of a branch (with 7 points). It was mentioned that a shift of focus to the private sector and the repair and maintenance unit is urgent since SIMA needs to increase its profits to be financially sustainable and commercially competitive. Also, this is the alternative which has the largest expected impact in net margins. It is also economically feasible since SIMA is already building a new shipyard. This new capacity would be sufficient as a starting point. Finally, it is expected some resistance from SIMA's direction and government entities since they are blind by the social role of the firm.

Chapter VII: Proposed Solution

The results of the assessment on the solutions indicates that a shift in SIMA's business focus is the most important solution to be implemented. It has the highest impact, it is economically feasible and it is an urgent measure to increase SIMA profits in the short-term. It is very likely to receive opposition by SIMA's direction once presented. However, it is necessary to explain the social impacts that this change could generate.

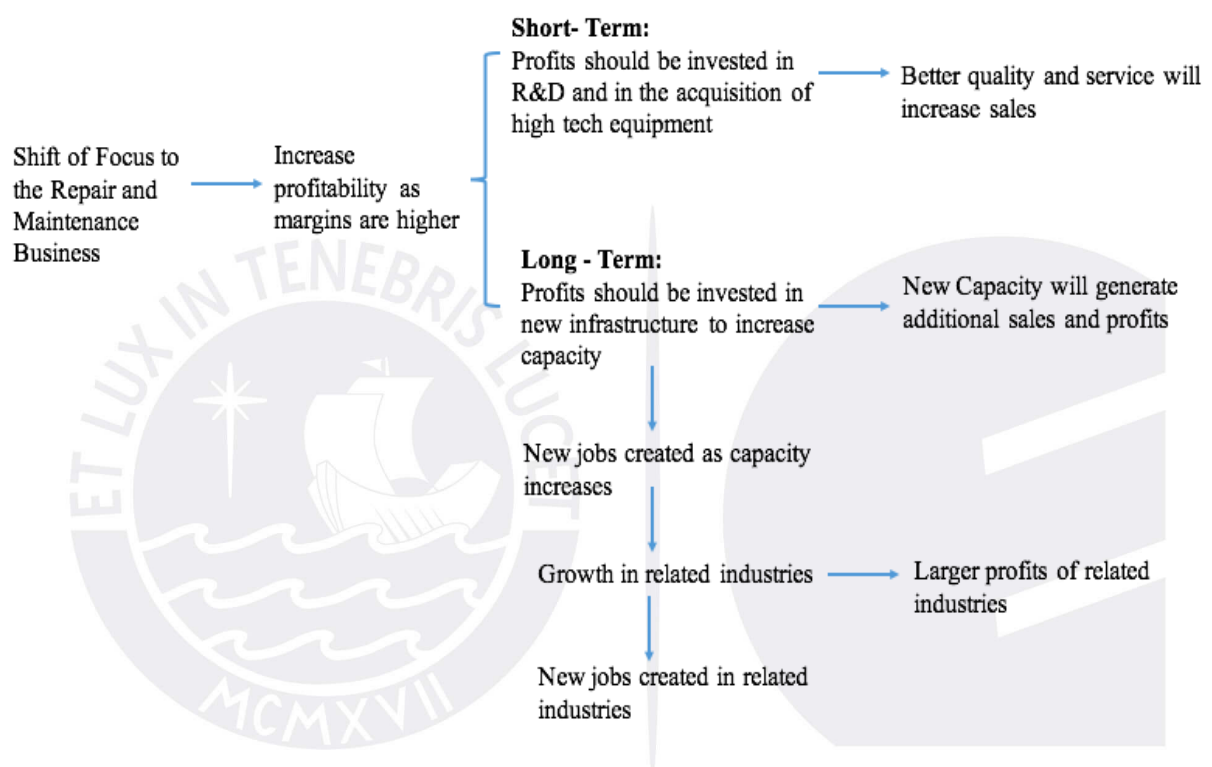


Figure 17. Consequences and impacts of shifting SIMA's focus to the repair and maintenance business.

As explained in Figure 17, the shift of focus will increase SIMA's profitability because the repairs business unit offers higher margins. It was shown in Table 5 that net margins of this unit are around 15% in comparison to shipbuilding's 5% and metalworking's 8% margins. In the short term, profits should be invested in R&D and in the acquisition of high-tech equipment to remain commercially competitive and attract private clients. The increased quality and service will also increase SIMA's sales. In the long term, profits should

be invested in infrastructure to increase capacity. New jobs will be created as a result of the additional capacity. At the same time, the increased capacity will generate additional sales and profits. Meanwhile, SIMA's growth will positively impact sales and profits of related industries. Lastly, these industries will increase its capacity as demand expands, resulting in the creation of new jobs. For instance, it is expected that the shift of focus would create a multiplier effect in the long-term.



Chapter VIII: Implementation Plan & Key Success Factors

8.1 Activities

As explained before, the strategy of shifting the focus from shipbuilding to repair and maintenance, and from public to private sector, requires SIMA to develop a complete business plan. The first step is to analyze the industry (especially competitors) and build a segmentation and positioning strategy which will serve as the roots of the business plan. These two parts are analyzed in the following section. The rest of the business plan and implementation will be carried out by SIMA. A Gantt chart is provided to serve as guidance for the implementation. It presents the detail of the following phases and the time that each phase / activity should take.

8.1.1 Market Intelligence

It is important for SIMA to identify its competitors and their positioning strategy. It has been mentioned before that shipbuilding's competition is worldwide since clients will look for the shipyard that best fit their requirements and budget. However, in the repair and maintenance business, the radius of competition is reduced to the shipyards that are located near the ship's routes. In this business, distance and time are crucial since owners incur losses during the days that ships remain inoperative.

For small and medium sized boats, SIMA's competition is local since this type of boat moves only along the Peruvian coast. Meanwhile, the competition spectrum for large and Panamax vessels (if SIMA decides to invest in Panamax docks in the future) is multi-regional, involving all the shipyards of the Pacific routes (Novoa, personal communication, July 21, 2016).

Figure 18 presents the map with the global shipping routes, where all the countries involved in the Pacific routes can be observed. It can be noted that SIMA's competitors involve not only South American shipyards but also Central American, North American and

Asian ones as well. The level of maritime commerce around the world can also be seen, which is categorized by colors. It is observed that the most frequented commerce routes are made between North America and Europe and North America and Asia. South American routes are still fewer but have large opportunities for growth.



Figure 18. Global shipping routes.

Data are from “Map of the Day: Global Shipping Routes”, U. De la Torre, 2013 (<http://www.divergingmarkets.com/wp-content/uploads/2013/04/2013.04.16.Global-Shipping-Routes.png>).

SIMA’s competitors for small and medium sized ships are made up by some seventeen Peruvian shipyards. They are located along the coast in the ports of Callao in Lima, Chimbote and Paita at the North, and Ilo at the South. The complete list is shown in Table 10. Additionally, there are three shipyards that are working but are not authorized by DICAPI (General Direction of Peruvian Coastguards). The first belongs to the fishing company Diamante. The second is the Paita Shipyard S.A. commercially called ASPASA. The third is

Ancor, which is located in the Callao Naval Base. Figure 19 shows the location of the competitors and their capacities.

Among the competitors, only three of them have exit to the ocean, which poses direct competition for SIMA: Construcciones A. Maggiolo, ASTASA, Varadero Sur and ASPASA. Additionally, if considering capacity and sales terms, only Maggiolo represents a direct threat. This firm together with SIMA dominates the market as an oligopoly. Lastly, it is important to mention that the quality and technology levels of national competitors are very low.

Table 10

National Competitors of SIMA for Small and Medium Sized Boats

Firm	Port	Ocean Exit
Andina de Desarrollo S.A. "ANDESA"	Callao	Not working
Construcciones A. Maggiolo S.A.	Callao	Yes
Factoría Naval S.A.	Callao	No
H.M. Representaciones S.A.	Callao	Not working
Ind. Tecn. Naval Sctensa	Callao	No
Servicios Nav. Indust. Callao S.A.C.	Callao	No
Ast. Serv. y Mant. Nav. "Serviman S.A."	Callao	No
Maestranza Portuaria EIRL	Callao	No
J.C. Astilleros S.A.	Chimbote	Not working
Astillero Luguensi E.I.R.Ltda.	Chimbote	No
Astillero y Servicios Bamar S.A.	Chimbote	No
ASTASA	Chimbote	Yes
Corporación Pesquera Hillary S.A.C.	Chimbote	No
Kon Tiki E.I.R.L.	Ilo	No
Varadero Sur Perú S.A.	Ilo	Yes
Servicios Tecn. Indust. Metal Naval E.I.R.L.	Paita	No
San Francisco	Paita	No

Note. Data are from "Market Study of Vessels up to 2000 DWT" by Servicios Industriales de la Marina (SIMA), 2012c.



Figure 19. SIMA's national competitors in the repair business. Data are from *Análisis Competidores* by Servicios Industriales de la Marina (SIMA), 2012e.

On the other hand, the large vessels industry is composed by bigger and more competitive firms mainly located in Chile, Panama, North America and China. Unlike the local competition, these companies can handle high capacity and carry out qualified work with the latest technology in equipment and infrastructure (Barzola, Bomble, Esquén & Koenig, 2013). Table 11 provides further information for the shipyards mentioned above.

Table 11

SIMA's Competitors in the Large-Sized Ships Segment

Country	Company Name	Business	Max. Capacity
Panamá	MEC	NR	Panamax
Ecuador	Astinave	NR	8,000 Ton
		NC	350 Ton
	Asenabra	NR	20,000 Dwt *
		NC	700 Ton
	Vatadur	NR	2,500 Ton
		NC	2,500 Ton
Chile	Asmar Talcahuano	NR	96,000 Dwt
		NC	50,000 Dwt
	Asmar Valparaíso	NR	-
	Asmar Magallanes	NR	3,570 Ton
	Sociber	NR	10,000 Ton
	Asenav	NC	1,000 Ton
	Marco Chilena Iquique	NR	1,000 Ton
		NC	1,000 Ton
	Marco Chilena Talcahuano	NR	1,000 Ton
	Detroit Chile	NC	1,200 Ton
		NR	1,200 Ton
Ascon	NC	-	
Colombia	Bocagrande	NR	96,000 Dwt
		NR	96,000 Dwt

Note. RN= Naval Repair, NC= Naval Constructions. Data are from "Market Study of Vessels up to 2000 DWT" by Servicios Industriales de la Marina (SIMA), 2012c.

8.1.2 Positioning Analysis

In order to analyze the positioning and competitive advantages of SIMA's competitors, five possible attributes of differentiation have been identified: (a) quality, (b) location, (c) cost, (d) capacity and (e) connectivity. Quality can be measured by the number of ISOs and certifications of each firm. Location is measured by the distance to important markets by sea and land.

Costs are determined mainly by the labor wages of each country, since the repair business is labor intensive. Therefore, labor costs differences among countries directly relates to a competitive advantage for the ship repair business. Figure 20 shows the hourly compensation costs in the manufacturing industry for a number of different countries. It can be noted that Latin America labor costs (represented by Mexico, Argentina and Brazil) fluctuates around \$6 and \$20, Japan \$35, South Korea \$21 and China less than \$5. In summary, China is the cost leader, followed by Latin American countries, South Korea, and Japan.

In order to analyze the labor costs in the region, minimum wages have been compared. Colombia has the lowest minimum wage between compared countries of \$233. They are followed by Peru (\$258), Ecuador (\$366), Chile (\$373) and Panama (\$529) (Federacion Interamericana de Asociaciones de Gestion Humana, 2016).

Capacity refers to the number, type and size of vessels that a shipyard can give service. It depends in the size of the shipyard and the parking space, the type of docks, the use of cranes and specialized equipment. For example, in South America only Chile and Panama have docks for Panamax ships. Also, they have specialized equipment for cutting submarines that few shipyards have.

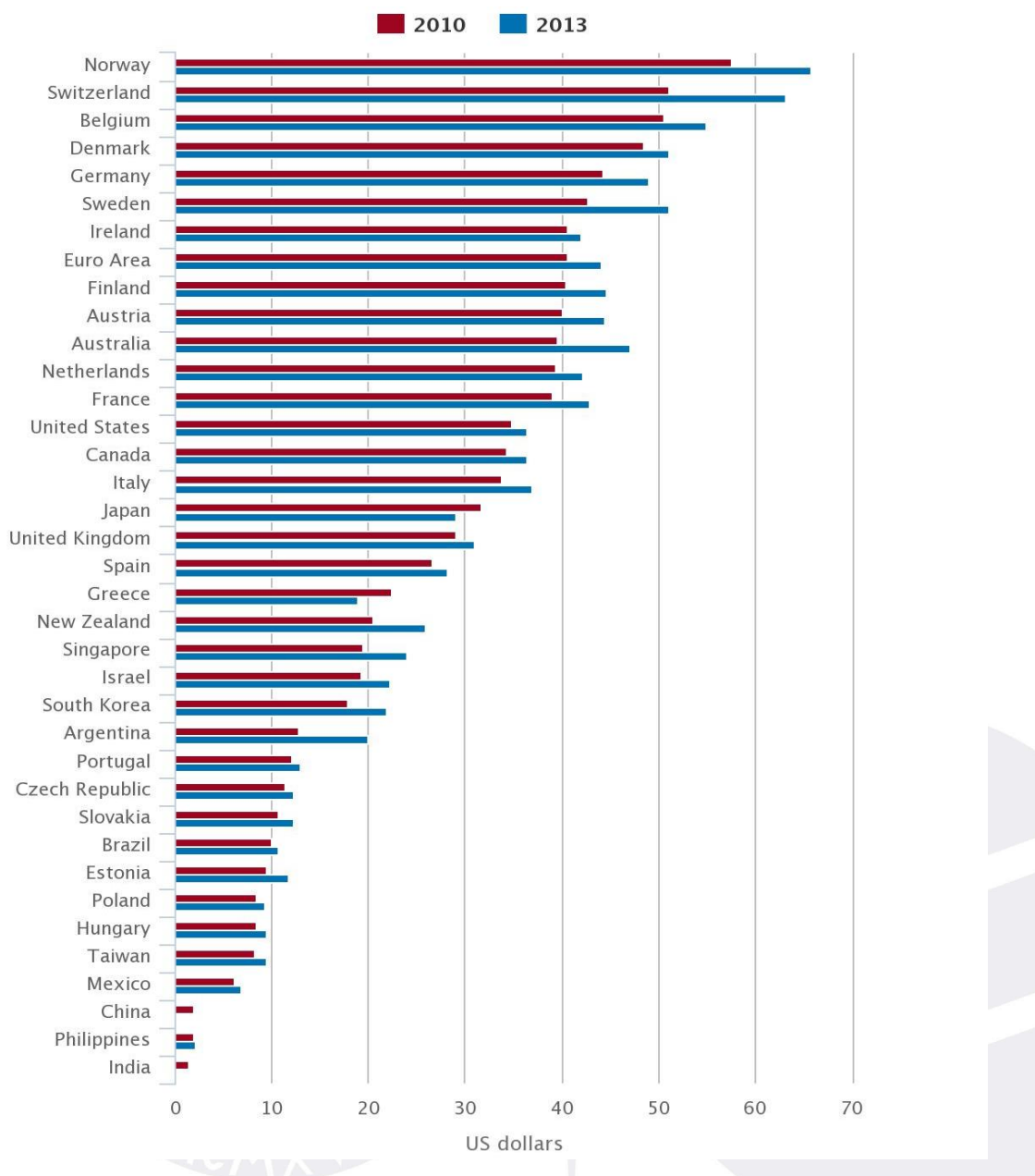


Figure 20. Hourly compensation costs in manufacturing, US dollars 2010, 2013. Compensation costs include direct pay, social insurance expenditures and labor related taxes. Data from “International Comparisons of Hourly Compensation Costs in Manufacturing, 2013”, The Conference Board, 2014 (<https://www.conference-board.org/ilcprogram/index.cfm?id=28269>).

Finally, connectivity and integration to the international maritime system can be measured with the LSCI (Liner Shipping Connectivity Index). This index aims to gauge the country's level of integration with the existing liner shipping network by measuring liner connectivity. The index is calculated based on four major components: (a) number of shipment calls, (b) capacity of containers, (c) number of shipping companies, liner services or

vessels per company, (d) and average and maximum vessel size (Rodriguez, 2016). As displayed in Table 12, Peru's maritime connectivity places above Ecuador and slightly higher than Chile. If this index is compared to other pacific countries such as Colombia, Panama, it suggests that Peru has still a lot of growth potential, related mainly with the port infrastructure and the repair and maintenance services supply.

Table 12

The Liner Shipping Connectivity Index 2015

Country	LSCI
Ecuador	21.7
Chile	36.3
Peru	36.9
Colombia	42.3
Panama	45.6
Japan	68.8
USA	96.7
South Korea	113.2
China	167.1

Note. Data are from "The Liner Shipping Connectivity Index 2015", The World Bank, 2015 (<http://data.worldbank.org/indicator/IS.SHP.GCNW.XQ>).

SIMA*General information*

Description. SIMA is a Peruvian state-owned company with experiences over 170 years. It was created to provide shipbuilding and technical services to the Peruvian Navy. Operations are performed in their three facilities: Callao, Chimbote, Iquitos.

Mission. The Industrial Services Marine SA carries out the maintenance, modernization and construction of the Peruvian Navy's ships and executes projects related to

Shipbuilding and Mechanical Metal for the state and private sector, national and abroad, with the most stringent quality standards, in order to contribute to the national defense and the socio-economic and technological development of the country (Servicios Industriales de la Marina, 2016).

Technology. It has been explained that some of the equipment used at SIMA is obsolete, especially the machines used for electricity, air compression, and the gas and water supply setup. In comparison to the largest shipyards of the world equipped with latest systems, it is clear that SIMA has a lot to improve.

Positioning criteria

Quality. The company has an Integrated Management System (IMS) oriented to provide goods and services that meet quality standards and customer's demands. The IMS incorporates mechanisms for environmental impact, pollution prevention, and workplace injuries prevention. They also have systems in place to deter any possible breaches of the company or civil law, which directly affects workers and stakeholders. SIMA has obtained the following certifications (Servicios Industriales de la Marina, 2014b):

- ISO 9001 (quality of products and processes)
- ISO 14001 (environmental practices)
- OHSAS 18001 (health and safety management)
- BASC (safety)

Location. Peru has a privileged location at the center of the South American west coast. Callao port is a competitive distance to most Asian countries. Also, as stated before, the maritime commerce in the Pacific Ocean has large opportunities for growth, especially with the Asian market. For this reason, it is of special importance for Peru to develop the required infrastructure to receive large Panamax Vessels and become the entrance port to the country. Figure 21 shows the Peruvian routes to the main ports of the Asia Pacific.

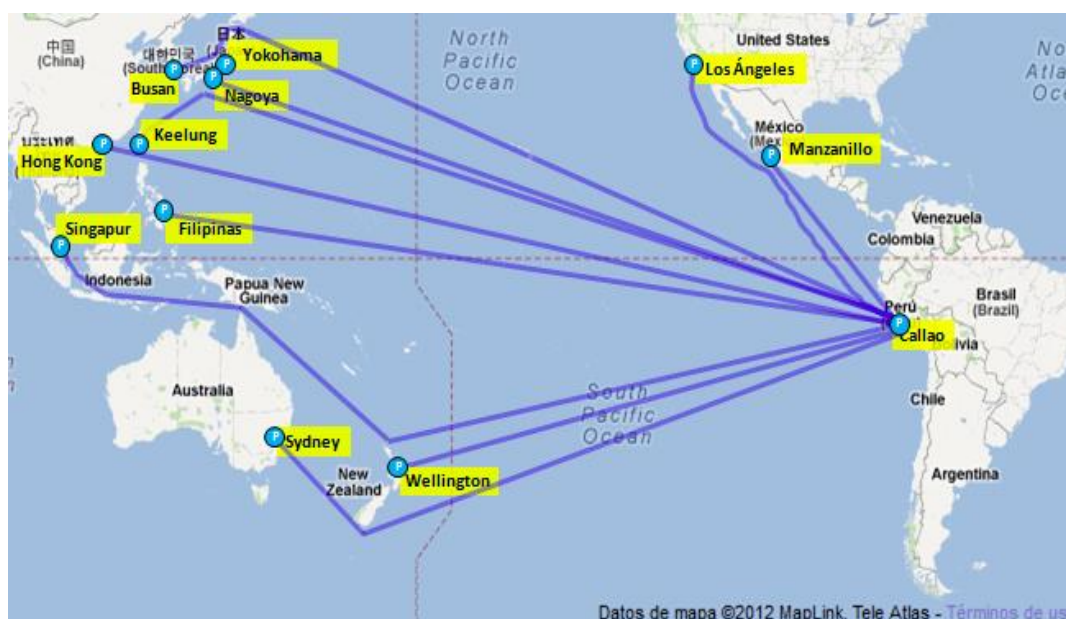


Figure 21. Peruvian routes to the main ports of Asia Pacific.

Data from “Peru: la Puerta al Comercio Exterior de América del Sur”, Voz Democrática, 2012

(<https://vozdemocratica.wordpress.com/2012/06/20/peru-la-puerta-al-comercio-exterior-de-america-del-sur/>)

Costs. As shown in Figure 20, Peru has the lowest labor costs of the region together with Colombia. The average wage is also below Japan's, and Korea's but above China's.

Capacity. SIMA counts on three facilities to perform repair services: Callao with capacity for vessels up to 25,000 DWT, Chimbote with capacity up to 1300 tons and Iquitos for river boats. The facility of Callao, which is the largest and most important, has an area of 300,000m². Repair services are performed in the four docks presented in the Table 13.

Table 13

SIMA Callao's Docks

Docks	Length	Beam	Cranes
Dry Dock	194.8m	26.8m	2
Floating Dock ADF 104	115.8m	23.3m	2
Floating Dock ADF 106	87.8m	13.7m	-
Floating Dock ADF 107	126m	15.5m	-

Note. Data are from “Plan Estratégico 2009-2013” by Servicios Industriales de la Marina (SIMA), 2008a.

SIMA's repair unit serves the following type of ships: tankers, bulk carriers, container ship, tuna fishing ships and fishing boats for national and non-national shipowners. The main repair services they provide are: sandblasting, hull repair works, propulsion and steering systems repair, boiler making works, maintenance of diesel engines, among others.

Connectivity. As shown in Table 12, Peru has lower levels of connectivity in comparison to Asian countries. In the region, it has similar levels to Chile but higher levels Ecuador but lower than Panama and Colombia. This may be explained by the trade volume in the country, and the development of shipping infrastructure.

Construcciones A. Maggiolo

General information

Description. Maggiolo is a private shipyard founded in 1942 at the Callao Port. It is focuses on shipbuilding, maintenance and repair (Construcciones A. Maggiolo, 2016a).

Mission. "Provide services related to the repair, construction and modification of ships and craft solutions; based on our competence, creativity and commitment; exceeding the expectations of our customers" (Construcciones A. Maggiolo, 2016a).

Technology. Oquendo shipyard counts with four cranes up to 100 tons, generators and compressors, tanks, underwater welding arc machines, *oxicorte* and plasma cutting machines and elevators (Construcciones A. Maggiolo, 2016b).

Positioning criteria

Quality. Maggiolo counts with the following certifications (Construcciones A. Maggiolo, 2016c):

- SGS: Repair and construction of artifacts and marine vessels.
- ISO 9001: Repair and construction of artifacts and marine vessels.
- American Bureau of Shipping: Certification Service of hull's thickness measurement and welding procedure specifications and qualification of welders.

- Bureau Veritas: Certification Service of hull's thickness measurement.
- Det Norske Veritas: Certification Service of hull's thickness measurement.
- American Welding Society: Inspectors of welding and nondestructive trials.

Location. A Maggiolo is also located as Callao, Lima having a privileged location over other south American countries.

Costs. As shown in Figure 20, Peru presents the lowest labor costs of the region together with Colombia. The average wage is also below the level found Japan and Korea but above the prices China offers.

Capacity. The company owns two shipyards: Chucuito and Oquendo. Chucuito occupies a total area of 10,000 m². It has 2 docks for ships up to 52 m. long and weighing 1,000 ton. This shipyard serves up to 100 boats a year. In 2010, the company started the operations of the new facility of Oquendo. It has the capacity to serve ships of up to 110 meters long and 2,500 ton. The shipyard has one dock, a mounting unit of 250 meters and a launch skid for oil platforms (Construcciones A. Maggiolo, 2016d). Maggiolo is specialized in maintenance for the following type of boats: fishing, harbour tugs and Offshore Supply Vessels (OSV), barges between 60 and 100 meters, tankers and gas carriers of up to 100 meters and foreign fishing vessels (Construcciones A. Maggiolo, 2016a).

Connectivity. As explained in SIMA's section, Peru has low levels of connectivity but has a promising future for growing their business.

Asmar and Asenav, Chile

General information

Description. Between the three main ship repair companies in Chile, Asmar, Asenav, and Detroit S.A., Asenav presents itself as the most competitive for the commercial shipbuilding and repair industry. Asmar is a publically owned and operated company and was founded in 1895. Like SIMA, a good portion of their time is spent on government

contracts. Asmar builds primarily for the Chilean and Ecuadorian navy, and for the Icelandic government (Astilleros y Maestranzas de la Armada, 2015). Lastly, Asenav was founded in 1972; by 2012, they had produced over 170 vessels of varying sizes. They offer a range of services for the maintaining and repair of vessels (Asenav, n.d.)

Positioning criteria

Quality. Asenav promotes their industry work as being competitive with the major European shipbuilding companies, they do not publish any certifications (Asenav, n.d.). Asmar, on the other hand, has a number of them: International Standards ISO-9001:2008 (Quality), OSHAS 18001:2007 (Safety and Occupational Health) and ISO 14001:2004 (Environment), (Asmar, 2015).

Location. Asenav offers competitive locations for vessels needing service in sense that they have three shipyards along the south Chilean coast (Asenav, n.d.). However, Peru's more central location offers a more logistical point for repairs than Chile's repairing ports in Valparaiso, Talcahuano and Valdivia (refer to Figure 19) since they are so far south. The Callao shipyard caters well to the Asian Pacific routes. Unless going around the southern tip, the Chilean repair ports would be too often out of the way for most shipping routes.

Costs. As mentioned in the section above, the labor costs are significantly lower in Latin America. However, as explained before Chile and Panama have the highest labor costs in the region.

Capacity. Of the three main Chilean Shipyards, Asmar offers the most extensive services. They offer both dry docks and afloat repairs, depending on the needs of the client. They have a broad range of specializations in Valparaiso which include: Thermal Insulation, Boilers and Heat Exchangers, Piping, Carpentry, Diesel Engines, Turbochargers, Gas turbines, Electrical Machinery, etc (Astilleros y Maestranzas de la Armada, 2015).

In the Talcahuano Shipyard, the facilities include: two dry docks, five floating docks (two of them roofed), over 1,100 m of berths and mooring sites with associated services, a new building slipway, and modern production centers in areas such as structures, electric, mechanics, diesel engines, machine-tools, boilers and piping, electronics, weapon systems, weapon mechanics, etc that support maintenance, repair, modernization, conversion, refit, and shipbuilding activities (Astilleros y Maestranzas de la Armada, 2015).

Connectivity. Peru offers a strategic point for a good volume of ship routes who regularly cross the Asian Pacific. Perhaps SIMA Callao is not as competitive as the port in Panama since it has access to ships on both sides of America, but it still presents itself as a central point in shipping routes for South America.

Astilleros Navlaes Ecuatorianos (ASTINAVE), Ecuador

General information

Description. ASTINAVE is a private maritime company based in Guayaquil, Ecuador. The shipbuilding company was created in 1907 when the president of Ecuador “decreed a regulation to create a marine Arsenal in the Guayaquil Port” (Astilleros Navlaes Ecuatorianos, 2015).

Mission. “Develop, produce and maintain solutions to enhance the defense, security and the maritime industry” (Astilleros Navlaes Ecuatorianos, 2015).

Technology. ASTINAVE has two different plants and each plant has its own workshop. The central plant and the south plant both have eight different workshops: welding, metalworking, electricity, electronic system, engines, auxiliary system, habitability and accessories, and surface preparation and painting.

Positioning criteria

Quality. ASTINAVE has an Integrated Management System (IMS) which allows them to deliver high quality service to their customers. In 2014, ASTINAVE was awarded by

the Ministry of Industry and Productivity. The company was recognized for having an ethical strategy which meets the four pillars of corporate social responsibility (Astilleros Navlaes Ecuatorianos, 2015). ASTINAVE EP also holds the following certifications:

- ISO 9001: quality management
- ISO 14001: management of environmental responsibilities
- OHSAS 18001: international occupational health and safety management system specification (OHSAS 18001, 2015)

Cost. Ecuador presents a medium-high labor cost in the region (\$366).

Capacity. ASTINAVE has a floating dock and provides both shipbuilding and ship repairs' services. ASTINAVE has two main plants. The central plant has the capacity of building ships up to 2,000 tons. They can repair vessels up to 700 tons and also provide design and production for command and control systems. The second main plant provides maintenance for vessels up to 6,000 tons (Astilleros Navlaes Ecuatorianos, 2015). ASTINAVE is specialized in maintenance and can carry out repairs for the following vessels:

- Coastal combat boats: LR-AST-0702
- Reaction and interceptor's boats: LP-AST-0802, LP-AST-1103, LP-AST-1304
- Coast guards boats: LG-AST-2606, LG-AST-4207
- Line defense vessels: CM-AST-9813
- Multipurpose vessels: BM-AST-8213

Recently, the ship company has awarded from Daman Shipyards Group a contract for a fourth patrol vessel. "In the last few years, ASTINAVE has built a great number of vessels in cooperation with Damen, including tugs, cutter suction dredgers, fast crew suppliers and patrol vessels" (World Maritime, 2014).

The company is planning on building a world class shipyard with two docks that will produce four Aframax vessels per year. Their main customer for these ships is the state-owned company FLOPEC in Ecuador. This new dry dock will allow the company to hire 3,000 more employees while improving their position for Ecuador in the shipbuilding industry. In addition, ASTINAVE will relocate its plant to improve its capacity. They will be able to create two offshore supply vessel (OSV). The company will create 500 more jobs opportunities (Ministerio Coordinador de Sectores Estratégicos, 2014).

Connectivity. As shown on Table 12, the Liner Shipping Connectivity Index 2015, Ecuador scores 21.7, placing it at the bottom of the list. It shows that Ecuador has a poor connectivity shipping infrastructure.

Cotecmar, Colombia

General information

Description. Cotecmar Shipyard is located in Cartagena, Colombia. The shipbuilding company was created by the Colombian National Army thanks to an association with National University. Cotecmar develops vessels for the army and private customers. In addition, the company is offering full line of ship repair and marine services such as diesel engine installation and repairs. Cotecmar is a science and technology corporation that have strong relation with university-company and prioritize research and development in new technology and business practices (Cotecmar, 2016).

Mission. Cotecmar offers advanced solutions to the maritime community in various sectors: military, industrial, commercial or private (Cotecmar, 2016).

Technology. The company owns machines and propulsion lines, welding and piping systems, electrical equipment and diesel engines (Cotecmar, 2016).

Positioning criteria

Quality. Cotecmar Shipyard fulfills the requirement of Llyod's Register. Cotecmar operates in accordance with CT DE and EPA NESHAP regulations. In addition, the company has the ISO 9001-2008 certification.

Location. The shipyard is based in the Cartagena's Bay and is only 180 miles away from the Panama Canal (Cotecmar, 2016). Figure 23 shows its privileged location with access to the routes of the Atlantic Ocean and to the Pacific through Panama's Canal.

Cost. As stated before, Colombia has the lowest labor costs of the region (\$233). The average cost is below Japan and South Korea's prices, but above China's.

Capacity. The company possesses two different facilities. The first one, Mamonal has eight docking positions and four different afloat repair locations. In addition, at Mamonal, Cotecmar has the capacity to lift vessels up to 3,600 tons and 117m of length. The second facility, Bocagrande, has the capacity of lifting 1,900 ton ships up to 66.5m of length. Cotecmar is specialized in the field of scientific and technology research in the maritime industry. The company has a strong competitive advantage in the area by being an innovative leader in the ship industry (Papadakis Shipyards Brokers & Co., n.d.).

Connectivity. From Table 12 which shows the Liner Shipping Connectivity Index 2015, Colombia scored 42.3. This country has a low-medium connectivity of shipping. However, in the Latin America area, Colombia is the second country after Panama with the highest LSCI.

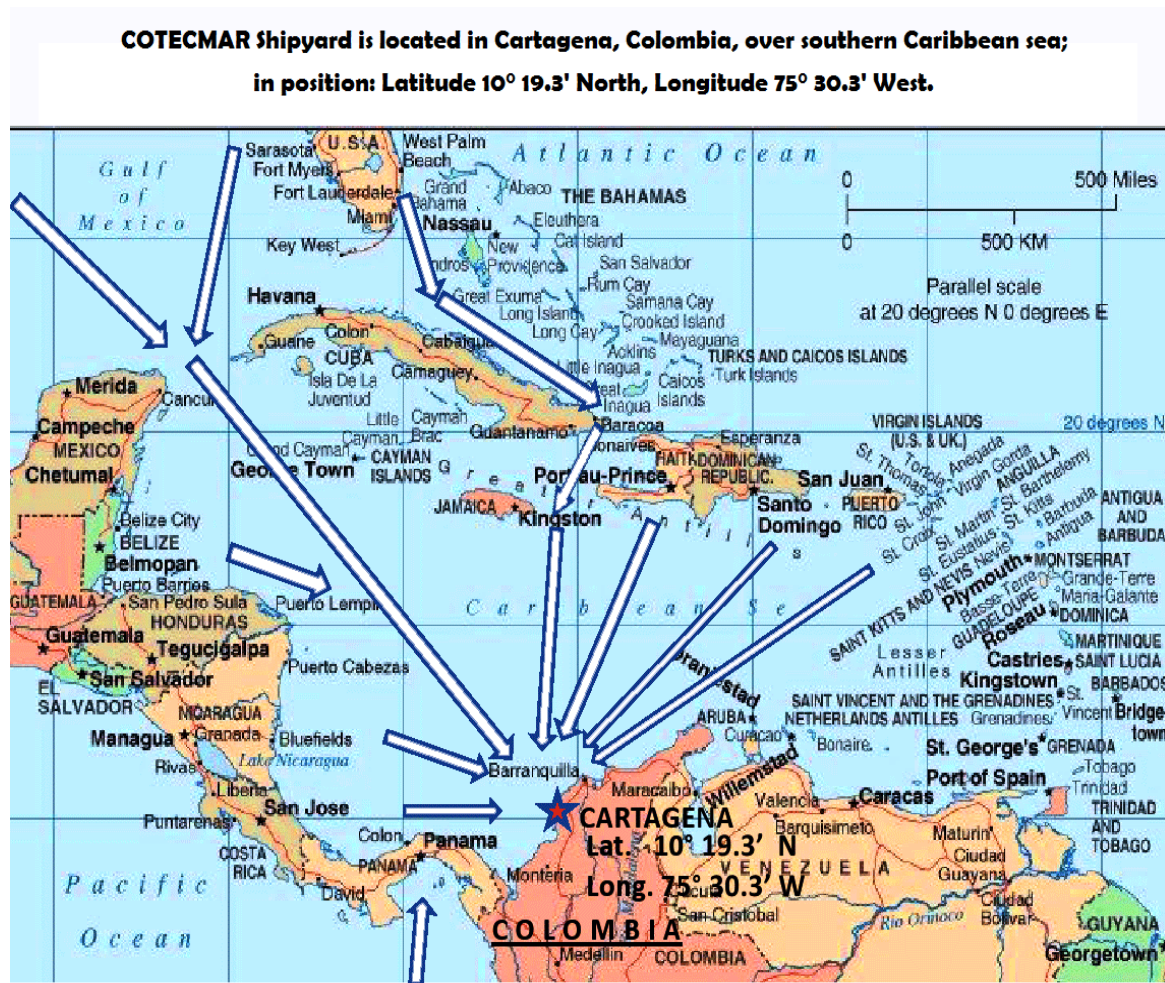


Figure 22. Cotecmar shipyard's location.
 Data from "Astillero Naval", CAC Marine Services, n.d.
 (<http://shipyard-shipdelivery.com/naval-shipyard>).

MEC Panama

General information

Description. MEC is a major international ship repair facility located in the port of Balboa, Panama. MEC Panama is under the control of a Corporate Governance. MEC Panama established its strategies based on its directors and stakeholders needs by enhancing the context of the social, regulatory and market environment (MEC Panama, 2016).

Mission. It is the mission of the entire staff of MEC Panama to provide the best value in ship repairs for the North and South American continents. "Our goal is to provide proper

ship repairs at a reasonable price, in a predictable and agreed allotted time, at an acceptable level of quality” (MEC Panama, 2016).

Technology. MEC Panama is specialized in the ship repair industry and they are the only company that possess a hyperbaric chamber in the region. The diving time of their operator surpasses all other companies' by more than 40% (MEC Panama, 2016). They also own underwater brush cleaning machines that improve the speed of their customers' ship. The Balboa Shipyard has a 400 ton hydraulic press, an automated MIG, TIG welding equipment, a steel plating unit and pipe shops with computerized cutters (MEC Panama, 2016).

Positioning criteria

Quality. MEC's shipyard demonstrates strong quality policies. They have received the ISO 9001 and 2008 certificates in 2014.

Location. MEC Panama owns two different shipyards. Balboa Shipyard is located in the port of Balboa at the Pacific Entrance of the Panama Canal. The second shipyard, Veracruz is located at the West of Balboa (MEC Panama, 2016). Panama has a privileged location with access to the Pacific and Atlantic Ocean.

Cost. As observed before, Panama has the highest labor cost of the region (\$529) and is above Japan, South Korea and China.

Capacity. MEC Panama owns three dry docks for vessels up to Panamax size with over than 12,000 sqm of fully equipped workshop (MEC Panama, 2016). In addition, the shipbuilding company provides 24 hours' afloat repairs service. Veracruz Shipyard has the capacity to repair eight ships at a time: four vessels up to 40 meters, two vessels up to 20 meters, and two vessels up to 70 meters. The description of MEC's Docks is shown in Table 14.

Table 14

Description of MEC's Docks

Dock No.	Size	Entrance	Maximum Draft	Keel Block Height
1	318m x 39m	33m	7.9m	1.75m
	1043ft x 128ft	110ft	26ft	5ft 9in
2	130m x 30.5m	26m	6.4m	1.75m
	426.5ft x 100ft	85ft	21ft	5ft 9in
3	70m x 17m	17m	4.3m	1.46m
	230ft x 55ft	55ft	14ft	4.8ft

Note. Data are from “Shipyards”, MEC Panama, 2015 (<http://www.mecpanama.com/shipyards.html>).

Connectivity. Panama got a score of 45.6 and this is the best score among the Latin American countries. However, it is still below Japan, USA, South Korea and China.

Hyundai Heavy Industries, South Korea

General information

Description. Hyundai Shipbuilding Division, is the world's number one shipbuilder. Chung Ju-yung, the founder of Hyundai Group, stepped into the ship industry during the 1970's, creating Hyundai Heavy Industries (HHI). Only 10 years after its first delivery, the firm reached a production size of 10 million DWT in vessel size. Since that time, the company has maintained its leading position in the shipbuilding industry. The company operates in two dockyards: Samho Heavy Industries and Hyundai Mipo Dockyard (Organization for Economic Co-operation and Development, 2012a).

Mission. “To consistently deliver unrivalled products and services. We are also committed to delivering superior satisfaction to our customers, more rewarding careers for our employees, and greater value to our clients” (“Mission Statement”, 2016).

Technology. Hyundai counts on their innovative and cutting-edge technology. Their industrial robots have been designated as world-class by the Korean government. They also have a strong green energy division (Organization for Economic Co-operation and Development, 2012a).

Positioning criteria

Quality. HHI has the ISO 14001, OHSAS 18001 and ISO 9001 (Hyundai Mipo Dockyard, 2016a).

Location. South Korea has a great location, since it has access to different shipping routes on the Pacific and Atlantic. However, it is located close to its big competitors like China who offer cheaper labor costs for services.

Cost. Korea's labor cost is medium-high, above Japan, slightly higher than Latin American countries and significantly higher than China.

Capacity. Hyundai Mipo Dockyard Co., Ltd. has four docks and four quays with the capacity of serving PANAMAX vessels (Hyundai Mipo Dockyard, 2016b). The capacity is detailed in Table 15. Additionally, Hyundai Samho Heavy Industries Co., Ltd. (HSHI) has two mega docks with a building capacity of 3.7 million GT per year and five Goliath cranes of a maximum lifting limit of 1200 tons and 900 tons (Hyundai Samho Heavy Industries, 2013). See Table 16 for details. With Panamax capacities and facilities, HHI builds and repairs a wide range of vessels: bulk carriers, tankers, container carriers, multipurpose carriers, car carriers, gas carriers, drill ships, offshore support vessels, offshore barges, tug dredgers, naval ships (Hyundai Corporation, n.d.).

Table 15

Hyundai Mipo Dockyard Co. Docks

Dock	Capacity	Dimension			Crane/Service
		L(m)	W(m)	H(m)	
No.1 Dock	400,000DWT	380	65	12.5	200Ton Kib Crane 3 80Ton Kib Crane 1
No.2 Dock	400,000DWT	380	65	12.5	200Ton Kib Crane 2
No.3 Dock	400,000DWT	380	65	12.5	200Ton Kib Crane 3 80Ton Kib Crane 1
No.4 Dock	350,000DWT	380	76	12.5	200Ton Kib Crane 2

Note. Data are from “Facilities: Dock”, Hyundai Mipo Dockyard, 2016b (<http://www.hmd.co.kr/english/02/03.php>).

Table 16

Hyundai Samho Heavy Industries Co. Docks

Assortment	NO.1 Dock	NO.2 Dock
Size (L x B x D)	504m x 100m x 13m	594m x 104m x 13m
Max. Building Capacity	800,000 DWT	1,000,000 DWT
Crane (Type & Capacity)	Goliath 600 Ton x 2 Jib 80 Ton x 1 Jib 40 Ton x 4	Goliath 900 Ton x 2 Jib 40 Ton x 2

Note. Data are from “Shipbuilding Division: Introduction Capacity”, Hyundai Samho Heavy Industries, 2013 (http://eng.hshi.co.kr/business/business01_2.asp).

Connectivity. Korea's connectivity index score of 113.2 places them in second place after China. This indicates that South Korea has great shipping infrastructure, and a developed shipping system. As a result, this country receives a great number of ships to work on for repair and maintenance services.

Mitsubishi Heavy Industries (MHI), Japan*General information*

Description. Yataro Iwasako is the founder of the private Mitsubishi Heavy Industries (Mitsubishi Heavy Industries, 2016a). There are three company subsidiaries that offer

shipbuilding and repair services: Yokohama Dockyard & Machinery Works, Nagasaki Shipyards & Machining Works and Shimonoseki Shipyard & Machine Works (Mitsubishi Heavy Industries, 2014).

Mission. MHI has established “Our Technologies, Your Tomorrow” as its corporate identity. This represents MHI's commitment to providing an sure future where people can lead safe, secure, and enriched lives for the sustainability of the earth and humankind with help from MHI's impressive technologies and passion (Mitsubishi Heavy Industries, 2016b).

Technology. The company use high tech design to reduce environmental impact. “MHI has integrated the 3D plant measurement technology at its nuclear power sector with the 3D CAD vessel design technique, actively promoting the engineering to repair vessels currently in service” ((Mitsubishi Heavy Industries, 2013).

Positioning criteria

Quality. MHI counts with the following certifications (Mitsubishi Hitachi Power Systems, 2016).

- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- OHSAS 18001: Occupational Health & Safety Assessment Series.

Location. Japan has the shortest distance to America. However, as it is an island it has no connection by land to other countries and thus has low chances of becoming a hub.

Cost. As shown in Figure 20, Japan has the most expensive labor cost in comparison to the other Asian and American countries. There is a significant gap of over \$30 USD in relation to that of China.

Capacity. Nagasaki Shipyard & Machinery Works (main plant) has three dry docks that support vessels up t o 270,000 DWT. Shimonoseki Shipyard & Machinery Works has three dry docks, one floating dock, seven piers, and 10 jib cranes. The dock can facilitate

ships up to the 270,000 DWT (Mitsubishi Heavy Industries, 2016a). “We can perform all kinds of damage repair work” (Mitsubishi Heavy Industries, 2016c).

With Panamax capacities and facilities the company is able to service all kinds of repairing works for LNG (Liquefied Natural Gas) ships, naval vessels, ferries, passenger ships, foundation improvement barges, replacement of propeller shafts and damage repair work (Mitsubishi Heavy Industries, 2016d). Table 17 shows the capacity of Shimonoseki Shipyard’s Docks.

Table 17

Shimonoseki Shipyard’s Docks

Dock No.	Length(m)	Width(m)	Depth(m)	Deadweight Capacity(t)	Crane (t x m)
No.1	350.0	60.0	08.8	270,000	16/64x40/80 80/35x40/65
No.2	270.0	60.0	09.8	120,000	80/35x40/65 40/15x40/65 16/6x40/80
No.3	180.0	30.0	10.7	038,000	10/5x40/60 16/6x40/80

Note. Data are from “Ship repair: Dry docks”, Mitsubishi Heavy Industries, 2016e (http://www.mhi-global.com/products/detail/dry_docks.html).

Table 18 shows the capacity of Japanese yards in number of docks and berths. MHI has the largest number of berths (6), Tsuneishi has the highest number of docks (5) and Universal Shipbuilding company the largest dock length (620m) ((Organization for Economic Co-operation and Development, 2012b).

Table 18

Japanese Yards Capacity

Shipbuilder	Yard	# Docks	# Berths	Dock length (m)	Dock beam (m)	Yard ranking by global order book
Oshima Shipbuilding Company	Oshima	1	-	299	80	8
Tsuneishi Zosen	Numakuma	5	2	380	59	15
Namura Shipbuilding	Imari	1	-	450	70	17
Mitsubishi Heavy Industries	Nagasaki	3	6	375	56	19
Imabari Shipbuilding	Marugame	2	-	370	57	22
Universal Shipbuilding	Tsu	2	4	500	75	33
Imabari Shipbuilding	Saijo	1	1	420	89	34
Sanoyas	Mizushima	3	-	270	80	41
Koyo Dock KK	Mihara	5	5	378	59	47
Universal Shipbuilding	Ariake	2	1	620	85	50

Note. Data are from “Peer review of the Japanese shipbuilding industry: Yard capacity-dock statistics”, The Organization for Economic Co-operation and Development, 2012b (<https://www.oecd.org/industry/ind/PeerReview-Shipbuilding-Japan.pdf>).

Connectivity. The Liner Shipping Connectivity Index of Japan is 68.8. It is significantly lower than China and South Korea but it is higher than Latin American countries.

China State Shipbuilding Corporation (CSSC), China

General information

Description. CSSC was formed in July 1982 by a group of several shipyards and association of marine equipment manufacturing and research companies. The company mainly focuses on shipbuilding, maintenance and repair as well as the production of Marine auxiliary vessels (Krishnan, 2011).

Mission. “Follow the market and capabilities, to grasp the rhythm, and control risk” (CSSC, 2007).

Technology. CSSC has advanced mechanized equipment in the repair docks and a variety of test equipment. Also dozens of world-renowned brands of marine equipment have been established in the repair center to further improve the quality of service (CSSC, 2007).

Positioning criteria

Quality. The firm counts with the following quality certifications (CSSC, 2007):

- ISO 9001: Quality Management System
- GB/T 24001: Guobiao standards
- ISO 14001: Environmental Management System
- OHSAS 18001: Occupational Health & Safety Assessment Series
- Pattern: CSSC has over 1000 patterns till 2015

Location. Regarding geographic location, it can be argued that Hong Kong together with London, Singapore and Busan have been ranked as the best ports around the world. Some of the criteria includes the volume of the port and the environmental conditions (Jakobsen, Mellbye & Sørvig, 2015).

Cost. China's labor cost is significantly lower in comparison to the other countries. It gives them an important competitive advantage, allowing them to offer the lowest repair prices of the world's industry.

Capacity. In 2011, CSSC achieved the shipbuilding goals of 57 ships, which is approximately 9.33 million tons of capacity. In 2015, CSSC accomplished a total ship repair goal of 301 ships. CSSC services rank from civilian ships, conventional tankers and bulk carriers to large container ships with the contemporary international advanced level. This forms a multi-species, multi-grade service system (Krishnan, 2011).

Connectivity. As Table 12 suggests, China has the highest levels of connectivity of all the other countries. In Asia, South Korea has the closest index, being an important competitor.

8.1.3 Segmentation and Positioning Results

The results of the positioning analysis are shown in Table 19. It can be noted that China is the most competitive country offering good quality and location, the lowest costs in the industry, high capacity of attention with Panamax services and the highest connectivity between the analyzed countries. It is followed by South Korea, Panama and Japan. The South American Countries are ranked at lower positions, SIMA being the most competitive company in the region.

SIMA offers the best combination of price (cost) and quality and location in the region. Although SIMA competes with other South American countries in quality, it beats them in cost and location. However, Chile and Panama have a higher capacity which includes Panamax repair services. Therefore, if SIMA wants to increase its competitiveness, a Panamax dock is needed plus an increase of capacity for medium and large size vessels. Also, the firm needs to replace its obsolete equipment with newer technology in order to guarantee quality and increase productivity.

Finally, in segmentation SIMA is participating in the repair and maintenance industry from small to large vessels up to 194.8m. Currently, they do not have a dock for Panamax ships. Finally, they are now building new infrastructure to serve submarines up to 2000 tons, which is projected to be finished in March 2017.

Table 19

SIMA and its Competitors Positioning Analysis

Indicators	Measurement	SIMA (Peru)	Maggiolo (Peru)	Asenav (Chile)	Asmar (Chile)	Astinave (Ecuador)	Braswell- MEC (Panama)	Boca Grande, Cotecmar (Colombia)	Mitsubishi Heavy Industries (Japan)	Hyundai Heavy Industries (South Korea)	CSSC (China)
1. Quality	# Certifications	5	4	3	5	5	4	4	5	5	5
2. Location	Distance to large markets	3	3	2	2	2	5	2	4	3	5
3. Cost	Labor Costs	4	4	3	3	3	2	4	2	3	5
4. Capacity	Docks capacity and diversity of vessels and services	3	2	5	3	3	5	3	5	5	5
5. Connectivity	LSCI	2	2	2	2	1	3	3	3.5	4	5
TOTAL		17	15	15	15	14	20	16	19.5	20	25

Note. Scale 1 to 5, being 5 the highest possible score.

8.2 Implementation Gantt Chart

The report has provided the three first steps of a business plan: industry analysis, competitors analysis and segmentation and positioning strategy. The first step, the industry analysis, is provided in Chapter 1. Competitors analysis and segmentation and positioning strategy are developed in the previous sections of this chapter.

Now, SIMA has to finish the strategy formulation and continue with the rest of the marketing plan and implementation. A Gantt Chart is shown in Figure 24 with the detail of the following phases. In the implementation phase it has been considered the other two solutions assessed in Chapter VI: Changes in HR policies and Changes in Procurement and Financial Practices. Other recommended activities such as attendance at The International Workboat Show and The Maintenance World Expo are detailed in the implementation plan.

Not all the activities of the implementation plan require an investment since most of the proposed solutions are directed to policy changes and negotiations that should be developed by managers of SIMA's divisions. For instance, the administration, HR, finance and procurement activities related to policies, training, internal communication and negotiations do not require investment. The marketing activities, which includes SIMA's attendance to two ship repair's shows and the firm's website remodeling are valued at \$15,000. One large investment would be the acquisition of the ERP software. These can vary between \$2M to \$17M depending on the brand (SAP, Oracle and Microsoft) (Wailgum, 2009). Lastly the purchase of new machines and equipment are already considered by the firm's management in the expansion plan of the new shipyard, which is valorized in 430MM soles (Novoa, personal communication, September 20, 2016).

	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Responsible Division	Investment
1. Market Analysis																			Done	-
Industry Analysis	DONE																			
Competitors Analysis	DONE																			
2. Strategy Formulation																			Marketing	-
Segmentation and Positioning Strategy	DONE																			
Formulation of the Value Proposition																				
Vision and Mission Reformulation																				
3. Formulation of the Marketing Plan																			Marketing	-
Product																				
Price																				
Distribution																				
Promotion																				
People																				
Process																				
Physical Environment																				
4. Implementation Plan																				
Marketing and Sales																			Marketing	\$15,000
Attendance to the International Workboat Show (Nov. 30- Dec 2)																				
Attendance to the Maintenance World Expo 2017 (6-7 June 2017)																				
Website remodeling																				
Submit Website in International Directories as http://www.shipyards.gr																				
Direct Marketing Activities to Current/Past Clients																				
Administrative																			CEO	-
Renegotiation with Government about marketing restrictions																				
Human Resource Management																			HR	-
Creation of Wage & Promotion Policy																				
Creation of Motivation Plan																				
Communication of Wage, Promotion Policy																				
Training of different specialties																				
Equipment Plan																			Procurement	\$130MM
Attendance to the International Workboat Show (Nov. 30- Dec 2)																				
Attendance to the Maintenance World Expo 2017 (6-7 June 2017)																				
Identification of latest equipment & infrastructure																				
Contact with suppliers of Quotations/Equipment Plan																				
Presentation of Equipment Plan to the Direction																				
Approval of ONAFE if needed																				
Purchase equipment																				
Procurement																			Procurement	SAP: \$16.8 million; Oracle: \$12.6 million; and Microsoft: \$2.6 million.
Analysis of possible ERP softwares to control stock and integrate suppliers																				
Proposal of software																				
Purchase of software if authorized																				
Implementation of ERP (20 months approximately)																				
Creation of purchasing process manual																				
Creation of new indicators to minimize errors																				
Communication and training																				
Finance																			Finance	-
Creation of payment policy																				
Search and Negotiation of financial instruments																				
Communication to suppliers																				
Finding new suppliers																				

Figure 23. Further steps Gantt. Planning activities do not require a monetary investment since they should be developed by the firm's managers.

8.3 Key Success Factors

8.3.1 Enablers

In order to shift the business focus and be successful, diverse enablers are required. First, it is important to convince marine officers who are at the direction of the company. The approval of FONAFE may also be needed or any other government entity. Additionally, to achieve growth and higher profits, SIMA needs to acquire high-tech equipment and increase its capacity. The shipyard expansion that is planned for 2019 has to be concluded.

Additionally, in order to grow at a higher scale and transform Callao's Port into a shipping hub, SIMA needs to invest in a Panamax dock. It is also important to negotiate growth with the government and eliminate some of SIMA's marketing restrictions (as publishing advertisements) in order to attract new clients.

8.3.2 Risks

The risks are related to the enablers. The proposal's major risk is that SIMA direction or the government rejects it. Thus it is important to convince them, explaining the large social benefits that will be generated. Another possible scenario is to get small collaboration from employees. However, this event has low probabilities since changes include a new wage and promotion policy that is beneficial for them. These policies should be planned carefully so that SIMA maintains its labor cost advantage over other South American countries. Finally, it is possible that Maggiolo increases capacity and quality or offers better prices in comparison to SIMA. Therefore, it is necessary to track all the movements of competitors.

Chapter IX: Expected Outcomes

After switching their business focus to ship repairs and maintenance, SIMA will enjoy both positive financial and social outcomes. It is crucial for SIMA to invest in research and development concerning offers of the best technology and business practices in the region. Then, if SIMA improves its infrastructure, their capacity will also increase.

The first expected outcome of switching business focus is financial. Indeed, as mentioned above, SIMA never has experienced a financial profit above 3%. The shipbuilding industry is highly competitive and offer small profits. Therefore, SIMA needs to change its focus to the repair and maintenance business unit that offer higher margins. For instance, MEC Panama is one of the most competitive companies in the region, and they specialized their primary business in repair and maintenance (MEC Panama, 2016).

It is crucial to define the impact of implementing the solution. By switching its focus to ship repairs and maintenance, SIMA would be able to attract more private customers and improve its current services. Therefore, the Peruvian company will be able to enhance its profits. It is interesting to compare different companies, to assess the possible effect of the solution in SIMA's margins.

Detroit Chile is a perfect example of a ship company that is successful. As shown on Table 6, the Chilean company obtained a profit of 9.15% in 2014. However, it is essential to acknowledge the fact that Detroit is a private corporation, and SIMA is a state-owned company. Therefore, a reasonable financial expected outcome from switching its business focus will be between 5-6% of profit.

The second expected result would be to improve the social impacts of SIMA. New profits would be invested in the expansion of the shipyard which would create new job opportunities for Peruvians. For instance, Ecuador is investing in a new shipyard that would

allow the company to have two more dry docks and hire more than 3000 workers (Ministerio Coordinador de Sectores Estratégicos, 2014).

Additionally, SIMA's profits could also be invested in quality infrastructure and technology to meet private client's expectations. This would allow SIMA to increase productivity and reduce costs and their services' times. In addition, this would increase SIMA's reputation as offering quality services.

In a nutshell, by switching its business focus, SIMA will improve its financial profits and will be able to invest in new technologies. Also, the company will support the Peruvian economy by offering new job opportunities for Peruvians. In addition, SIMA's growth would also affect related industries. Their local suppliers would also grow as a consequence, creating new job positions. Finally, tax collection would also increase with revenues growth of SIMA and its related businesses.

The expected financial results are explained in Table 20. In 2015, repair sales of SIMA accounted for 123MM soles with a capacity of repairing seven small ships at a time in Callao's shipyard. The repair's sales of 2015 are considered a good basis since during that year non shipbuilding works were performed and the whole capacity was used in the repair and metal working business units. Sales to private clients represented 16% and the firm obtained a 2.3% net margin.

Next year, the new shipyard would be inaugurated which has the capacity to serve four more ships at the same time. Therefore, it is expected to increase sales to 200MM soles. The new capacity should be used to serve private clients; therefore, private sales are expected to represent 40% of total revenues. If private sales increases in the repairs' business thence, net margins would also increase. The objective for 2017 is to increase it from 2.3% to 5%.

Finally, the second phase of the new shipyard would be ready for 2019. By then, SIMA Callao would be able to repair 17 ships at the time and sales would increase to 300MM

soles. The proportion of private sales should increase to 50% against total revenues. Lastly, the objective net margin for this year is 6%.

Table 20

Expected Financial Outcomes

Year	Capacity ^c (medium sized ships)	Repair's Sales (soles)	Private Clients' Sales (%) ^d	Net Margins
2015 ^a	7 ships	123MM	16%	2.3%
2017 ^b	11 ships + 1 submarine	200MM	40%	5%
2019 ^b	17 ships + 1 submarine	300MM	50%	6%

Note. ^a Data are from "Memoria Annual" by Servicios Industriales de la Marina (SIMA), 2016.

^b Data from 2017 and 2019 are projected. ^c Capacity refers to the number of small sized ships and submarines that can be repaired at the same time in Callao's shipyard. ^d Private Clients' Sales are calculated by the formula private sales/ total sales.



Chapter X: Conclusions and Recommendations

10.1 Conclusions

The shipbuilding industry is slowly recovering from the world's financial crisis and facing low profits margins and depressed prices. The repairs unit however, has not been affected in the same level as ship-owners prefer to repair their vessels rather than buying new ones. In addition, increasingly aggressive competition in the world market like China, is threatening SIMA's worldwide position.

Moreover, SIMA Callao's greatest strength is also its biggest weakness: the government's close ties to the company could either push the project forward or deter any future opportunity for the potential shipyard. The small profits SIMA generates inhibits them from growing and increasing their capacities. Other weaknesses of the company are related to the lack of policies, the obsolete and insufficient infrastructure and the lack of a long-term planning. In the other hand, its high skilled and low cost workforce, its ISO certifications a its great location should be taken into consideration to formulate its positioning strategy and competitive advantages.

The key problem identified is the small profits that have been obtained in the last years. Net margins had been fluctuating around 2.3%. In particular, the type of ownership of SIMA (public company) and its social role is restricting its financial results. As suggested by the quantitative analysis, there is a potential increase in profits if SIMA increases its capacity to serve private clients. Profit margins could increase at rates around 6% to 7%, taking the Chilean Detroit as benchmark.

Through a fish-bone analysis, the key problem has been broken down into its main causes: management, workers, working conditions, materials, machines and infrastructure and marketing. First, SIMA's management is blinded by its social role, impeding them to see the economic opportunities. Moreover, there are other problems related to workforce as fixed

contracts and highly specialized labor force and the lack of a wage and promotion policy based on productivity and results. Regarding materials, the firm lacks a payment policy and does not use financial instruments as letter of credits in their international operations. Also, purchasing errors are generating delays and bottlenecks in the process. Furthermore, the insufficient and obsolete infrastructure is related to the lack of capacity and the loss of sales and clients. Lastly, the company lacks good market intelligence and a clear positioning strategy.

In order to increase profits, SIMA needs to change its focus from the shipbuilding to the repair and maintenance industry that offers higher margins. Additionally, the HR division must undergo some changes in its policies combined with new action to eliminate the problems presented. Some recommended actions are to establish a wage and promotion policy based on productivity, train employees in different positions, hire civilians with business studies and increase motivation to reduce rotation. Furthermore, a supplier's payment policy has to be created, including the use of financial instruments to protect international operations. Also, SIMA needs to invest in new equipment and infrastructure (expansion of shipyard, construction of new docks, Panamax docks etc.) to increase their capacity.

Lastly, in order to be successful in repair and maintenance, SIMA needs to start from the bottom by developing a new business plan. The first parts of the plan have been developed in this report, which includes: industry analysis, competitor's analysis and formulation of a positioning strategy. After comparing SIMA to its competitors, it is concluded that SIMA offers the best relationship between cost and quality and the best location in the region. However, if SIMA wants to increase its competitiveness, a Panamax dock is needed plus an increase of capacity for medium and large size vessels. Also, the firm needs to replace its obsolete equipment for high technology in order to guarantee quality and

increase productivity. If all the recommendations are performed, then the firm can increase its profitability to rates around 6%.

10.2 Recommendations

First, in order to shift the firm's focus, it is important for the Strategic Planning Manager to convince SIMA's board of directors and government regulators by explaining the social benefits that would be generated with higher profits. Chapter VII can serve as a guide to elaborate the arguments. It is also important to implement changes in the HR division. In order to create stability in SIMA's direction, HR should increase the marine officers labor period to at least five years and recruit civilian's managers with business backgrounds. Thereby, the firm could begin thinking strategically, planning long term initiatives and investments.

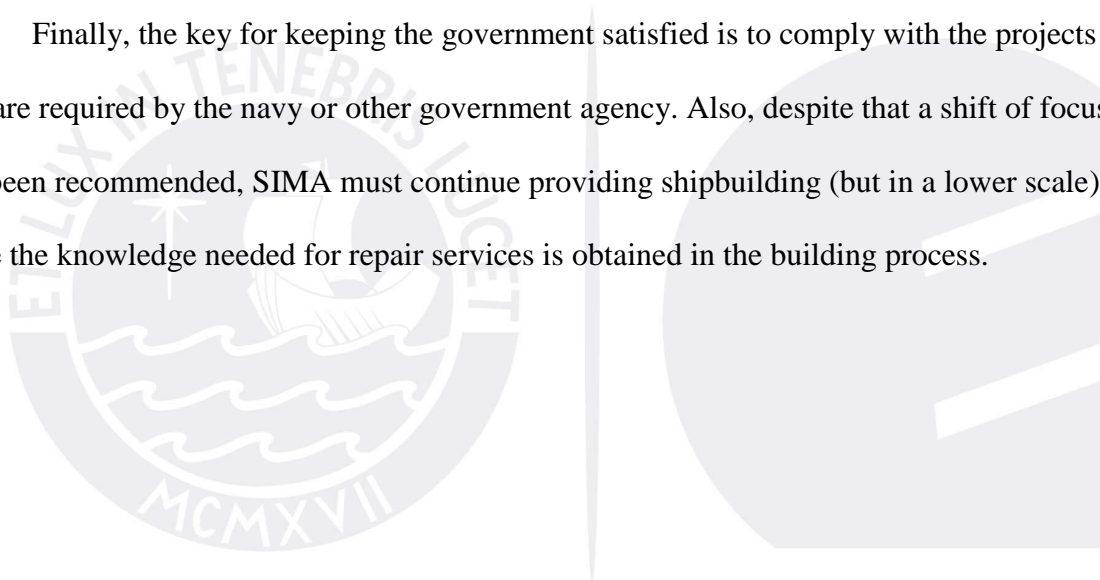
Workers are essential to guarantee the quality of the service. Thus, the HR division needs to motivate the workers by creating incentives and a fair wage and promotion policy based on productivity. It is necessary a salary raise, however SIMA should be careful to keep it at a limit where they maintain its cost leadership in the region. Additionally, employees' results could be tracked on a daily/weekly basis and set clear and realistic goals. Also, training is essential to create a multi-disciplinary workforce and keep them updated on the latest techniques and use of new equipment.

Also, in order to increase its competitiveness, the management should prioritize investments in new equipment and infrastructure, expanding the shipyard for small to large size vessels, and building a new dock for Panamax ships. It is recommended that the procurement and operation managers attend The International Workboat Show and The Maintenance World Expo 2017 to search for new technologies to improve quality and productivity. It is also recommended to invest in an ERP software in order to integrate

information across the business units. In addition, procurement and finance policies should be implemented to standardize and formalize processes.

Additionally, a more proactive role of the marketing department is needed. They have to start searching for clients now through direct marketing initiatives which are allowed. However, SIMA needs to negotiate with the government to eliminate the marketing restrictions that have been imposed and that are impeding them on reaching new clients. Furthermore, the workout sessions are highly recommended, since employees are the best source for identifying problems and finding out solutions. In this way, SIMA's continuous improvement could generate lower costs and higher revenues every year. Also, it is the best way to eliminate bureaucracy and speed up processes.

Finally, the key for keeping the government satisfied is to comply with the projects that are required by the navy or other government agency. Also, despite that a shift of focus has been recommended, SIMA must continue providing shipbuilding (but in a lower scale), since the knowledge needed for repair services is obtained in the building process.



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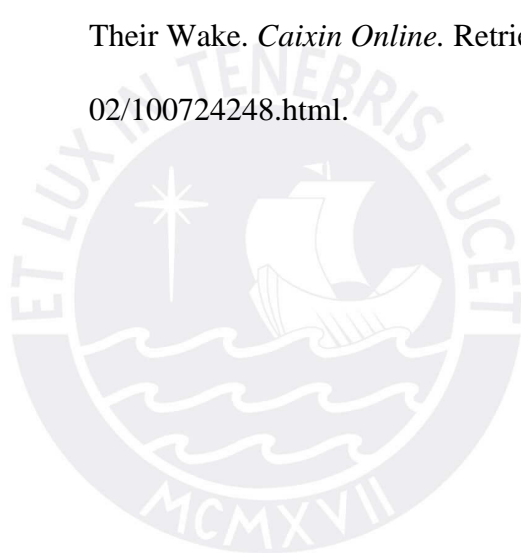
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Appendix A: SIMA's Profit and Loss Statement 2015, 2014

Table A1

SIMA's Profit and Loss Statement 2015, 2014

	2015 (PEN)	2014 (PEN)
Revenues		
Revenues from Goods	318,393,204	250,802,432
Revenues from Services	553,535	111,088
Total Revenues	318,946,739	250,913,520
Operational Costs	-310,240,249	-233,223,422
Gross Earnings	8,706,490	17,690,098
Sales and Distribution Expenses	-1,531,880	-732,379
Administrative Expenses	-27,567,482	-24,589,945
Other Operating Revenues	2,419,804	1,629,969
Other Operating Expenses	-51,527	-37,050
Operating Earnings	-18,024,595	-6,039,307
Financial Revenues	10,271,370	6,488,202
Financial Expenses	-1,932,091	-1,989,605
Exchange rate Earnings	43,050,668	15,458,347
Exchange rate Loses	-21,865,500	-4,299,637
Earnings before Taxes	11,499,872	9,618,000
Sales Taxes	-3,914,478	-3,711,523
Final Result	7,585,394	5,906,477

Note. Data are from "Memoria Annual Año 2015" by Servicios Industriales de la Marina (SIMA), 2016.

Appendix B: SIMA's Unserved Ships

Table B1

SIMA's Unserved Ships During 2011

Client	Ship	Length
AMAPE	SEYKO 52	-
AMAPE	TOEY 15	-
TRAMARSA	DALMOR II	94
DOLMAR	CARMELA	69
DOLMAR	REYNA DE LA PAZ	81.7
UMC	YING SHUN 368	59.2
UMC	KENYO MARU 1	47.32
UMC	KENYO MARU 2	50.8
DOLMAR	PRIMERO DIOS	30.4
TRANSGAS	VIRGO GAS I	75
SEGANPORT	CERVERA	41
DOLMAR	DRENEC	80.5
DOLMAR	URGORA	49
MGP	FM-53	114
MGP	FM-57	114
IMI	ENERGI 9501	101.8
MARIT D WORDL	XIN SHI JI 8	55.97
GYOREN	KINEI MARU 138	58
Excelsior Shipping Co. Limited	ANGELES B	140

Note. Data are from “Estudio de Preinversión a Nivel de Perfil: Ampliación de la Capacidad de Reparaciones de Naves de Bajo y Medio Bordo del Astillero de SIMA-CALLAO” by C. Novoa., 2012.

Table B1 (continuation)

SIMA's Unserved Ships During 2011

Client	Ship	Length
MARIT OCEANICA	HAI ZHI XING 601	38.73
DOLMAR	B/T MONTECRUZ	97
MARIT DEL WORDL	CHENG KAI YU LENG 2	70
PESQUERA PELAYO	DOÑA ADY	41.5
PESQUERA PELAYO	AMAZONAS	26.13
GYOREN	KINEI MARU 88	55
MARIT OCEANICA	HONG YUN Nro. 1	50.5
MARIT OCEANICA	HONG YUN Nro. 3	50.5
IMI	ENERGI 9501	101.8
AMAPE	MARIANE	39.8
ASIA MARITIMA	05 DONG IL	60.09
	M/N FRIO CANARIAS	112
GYOREN	ISOMAE MARU 21	53
GYOREN	WAKASHIO 85	70
DOLMAR	CONTADORA 1	83.1
DOLLMAR	LUCILE F	78.85
CODRALUX	DN - 125	51.6
SEGAMPORT	NVO XEIXAL	37.6
TRAMARSA	R/M PACHACAMAC	26.5
TRAMARSA	ALETA AZUL	70
MGP	BAP DUEÑAS	48.6
TASA	TASA 417	38.83
DOLMAR	M/N LA MANCHE	172.1

Note. Data are from “Estudio de Preinversión a Nivel de Perfil: Ampliación de la Capacidad de Reparaciones de Naves de Bajo y Medio Bordo del Astillero de SIMA-CALLAO” by C. Novoa., 2012.

Table B1 (continuation)

SIMA's Unserved Ships During 2011

Client	Ship	Length
OLCESE	ADI 05 ExARD-31)	150.6
SIMAC	ADF-107	147
AMAPE	KAIO MARU 81	57.81
AMAPE	KAIO MARU 108	58.6
IMI	BAHIA BAYOVAR	73.02
MGP	BAP UNION	158.9
PORT LOG	GERMCS	120.43
MARI DEL WORD	E/P HAE IN 21	61.09
MARIT DEL WORDL	HUA YING 1	59.96
SEGAMPORT	SIEMPRE SOCIO	38
DOLMAR	CURIMAGUA	76.1
MARIT DEL WORDL	5 DONG IL	67.9
COSMOS	JULIE L	71.5
INMARSA	R/M NEPTUNO	30.5

Note. Data are from “Estudio de Preinversión a Nivel de Perfil: Ampliación de la Capacidad de Reparaciones de Naves de Bajo y Medio Bordo del Astillero de SIMA-CALLAO” by C. Novoa, 2012.