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Potential Development Strategy for the Shipbuilding and Ship Repair in Baltics: A Case Study of Latvia

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ABSTRACT

This research is focused on the shipbuilding and ship repair industries in Latvia. The main purpose of this manuscript is to investigate all possible options to further develop the shipbuilding and ship repair industries in Latvia Initially, a brief overview of Baltics and of Latvia, with its biggest shipbuilding companies and its possibilities, are depicted in detail. The analysis is developed with the help of SWOT analysis and a Risk assessment matrix to find Latvia's strengths, weaknesses, opportunities, and threats, then to identify all possible risks in order to identify potential issues that could negatively impact key business initiatives or critical projects, and to develop a marketing strategy. It is concluded that Latvian shipbuilding can be benefited by i) its strategic location in Baltics, ii) the highly qualified workforce employed in Latvian shipyards, iii) the certified naval expertise of the shipbuilding facilities. At the same time, the external environment and the regional competition is harsh and some points are suggested for Latvian shipbuilding to survive and possibly flourish over the next years, such as: i) repair the technologically obsolete equipment and facilities to be able to satisfy the present market trends, ii) incorporate and utilize new materials and technologies, iii) give incentives to qualified natives that went abroad for employment to similar facilities to return to Latvia and utilize their accumulated experience, thus solving the issue of the declining workforce on the sector and iv) specialize in some aspects of shipbuilding, such as luxury ships and ice class, to secure a more specialised and dedicated market.

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1 Introduction

Latvia is a maritime country both historically and geographically. People who lived close to the seashores of the Baltic Sea had a long history of building the fishing boats and large merchant ships, in order to reach other countries. The largest Latvian cities were formed on the banks of rivers and near the Baltic Sea. For these reasons, the shipbuilding industry, namely the building, repair and maintenance of ships and other floating constructions, is now an important, but very complicated branch of national industry.

Recently, the world seaborne trade has successfully emerged from a prolonged recession, and the situation in the shipbuilding and ship repair industry is slowly beginning to recover. The latter can be seen also in Latvia. Such a toxic situation created by the global market is due to the fact that in the context of globalization the worldwide shipbuilding and ship repair, like other sectors of the economy, is largely dependent on global trends. For Latvia, it was the economic crisis of 2008- 2010, and the situation with the billateral sanctions against Russia in 2015-2016. All these events significantly worsened the key indicators of the sector, as well as the economic indicators of Latvia in general, and caused a lot of problems, that are relevant to this day. A detailed description of all actual problems can be found bellow. The most basic of them are: the deplorable situation with some of the main leaders of ship repair companies of the past years – JSC Riga Shipyard and its acquired company JSC Tosmare Shipyard, the outdated equipment and machinery, which have not changed over the years, the lack of the ability of Latvian shipbuilding and ship repair companies to accept large vessels, refusal of Latvian government to support

the shipbuilding and ship repair sector, and the problem with understaffed shipbuilding and ship repair sector at all levels.

2 The history of Latvian shipbuilding

One Latvian writer – Voldemars Šmulders, once wrote in his book called "The Yearbook of Shipping 1930/1931": "The history of the ship is as old as the history of mankind itself. The emergence of the ship is foggy. We can only imagine that. The idea of the such a creation like ship, is probably given by nature itself. Caught in the right moment, a man found out that swimming with the tree trunk is much easier than without it." People like Voldemars Šmulders were not so many in Latvia, but still they were the ones who, little by little, made their contribution to the history of shipping and shipbuilding in Latvia. They developed this craft as best they could, making it a matter of their whole life.

Unfortunately, almost nothing is known about the shipbuilding industry in Latvia in Middle Ages or shortly thereafter. But since the largest Latvian cities were formed on the banks of rivers and near the Baltic Sea, it is quite logical to assume, that people needed kind of a river or sea transportation in order to transport any kind of goods, cargo, people, etc. Thus it can be concluded that the construction of a floating equipment was obligatory indeed and was held of the territory of Latvia.

In addition, archeologists found artifacts, which are indicative of settlement existence at least a century before Riga founding, i.e. before 1201, which were found exactly on the banks of Daugava river – the biggest river in Latvia. It is said that as early as the 5th century the Daugava river was involved in international trade route between the Baltic and the Black seas. The particularly intensive traffic has been witnessed starting with the 9th century, when the route from the Varangians to the Greeks leaded along the river (Riga Port Authority, 2017). Originally the first known inhabitants on the territory of the lower reaches of the Daugava river were Curonians but starting from the 11th century they were replaced with Livs. Both Curonians and Livs were seafarers, therefore, they were definitely trying to build ships, boats or any other floating constructions.

The very first reliable evidence of how ships were built in Latvia are related to the times of Duke Jacob. It can be confidently said, that during the times of the Duchy of Courland and Semigallia in the 17th century, the shipbuilding industry was developing quite dynamically and during the reign of Duke Jacob (1642-1682) almost six shipyards were operating at the same time (in Courland) and more than 40 warships and about 80 merchant ships were built in Ventspils city. At the end of the 17th century, small shipyards also started to operate in Riga: the first shipyard was built in 1672 in Kundzinsala, as well as the merchant E. Metsi von Dannenstern, who came from Amsterdam, built the second shipyard and in 1695 he already owned ten ships.

At the beginning of the 19th century, the government of Russian Empire distributed several laws in the province of Vidzeme that were favorable for the development of both Latvian shipbuilding and shipping. As for example, one of the adopted regulations were the Law on the Extension of Shipping and Shipbuilding, issued in 1800, which allowed seafarers to build ships for their own use and an additional law issued in 1806 allowing builders to sell their own ships. Taking into account the experience of the ancestors in the construction of boats, almost everyone along the Latvian coast started to build barges, small ships and boats.

Thanks to Krišjānis Valdemārs (he established the first Latvian naval school in Ainaži), in the middle of the 19th century, the famous era of Latvian sailing yachts began. In 1913, after the proclamation of the state of Latvia, "Mīlgrāvis Shipyard, Riga, J. K. Jessens" and shortly thereafter Joint Stock Company "Vairogs" were founded. By the end of the 1930s, there was a lot of orderbooks for the "Vairogs" shipyard, where constantly worked about 200 people, but unfortunately in 1939 the factory was forced to close and already in 1940, the factory was nationalized and incorporated into the USSR Marine Fleet Commissariat of Enterprises. Between 1947 and 1991 (time of the USSR), 316 ships were built at the Riga Shipyard (now "Rīgas kuģu būvētava" Ltd.), including 34 port tugs with 150 HP and sea tugs with 1200 HP output. Also during the reign of the USSR, the first Tehumardi-type passenger ferry was built for more than two years as it was a new challenge for the Riga Shipyard. These were ice class ferries – 57 m long and 12 m wide with a draft of 4.5 m, which could accommodate 120 passengers, 40 cars and 10 trucks. In today's view, such a ship might seem very small, but in the 1970s and 1980s it was a great achievement and a novelty.

3 Current situation of Latvian shipbuilding

3.1 Characterization of the industry

Shipbuilding and ship repair industry of Latvia is an integral part of the regional economy, because historically and geographically, Latvia is a maritime state. The shores of the Baltic Sea in Latvia are 500 km long. Therefore, at present the shipping industry – construction, repair and maintenance of ships and other vessels – is an important part of the country's industry.

It was particularly surprising that the number of companies engaged in ship repair and modernization in Latvia is quite impressive – 23 companies offer ship repair services in Latvia, as it can be evidenced in the website of the Maritime Administration of Latvia (Maritime Administration of Latvia, 2019). On the other hand, the situation with the shipbuilding is different, since there only few companies engaged in such services. For example, there are some relatively large shipbuilding companies – joint stock company "Rīgas kuģu būvētava" (Riga Shipyard) and joint stock company "Tosmares kuģu būvētava" (Tosmare Ship-

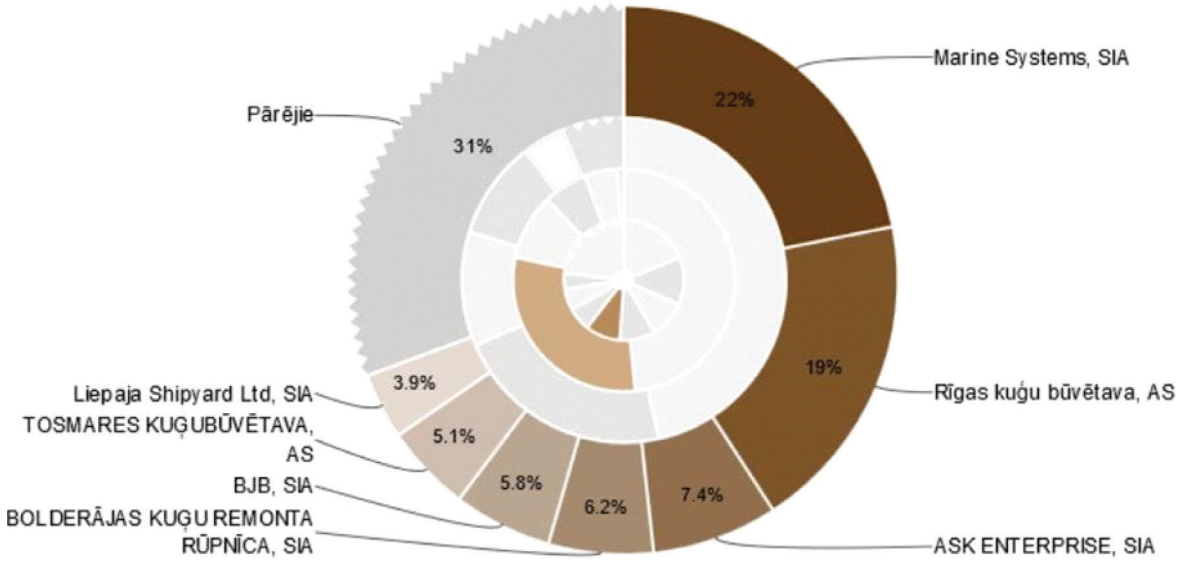

Chart 1 Share of net turnover of 2020 of shipbuilding and ship repair companies of Latvia

Source: ZoomCharts.com

yard), whose shares were purchased by Riga Shipyard in March 2000. As well as there are "ASK ENTERPRISE" Ltd. and "BJB" Ltd., which are engaged in the design, construction and modernization of ships.

The above Chart 1 clearly shows the main division of Latvian shipbuilding and ship repair companies by the net turnover of 2020. The largest percentage – 22%, gets the Marine Systems (which mainly produces diesel generators), then goes Riga Shipyard with 19%. The next company is ASK ENTERPRISE with its 7,4%, after goes Bolderaya Ship Repair Enterprise with 6,2%, then goes BJB Ltd. with 5,8%, Tosmare Shipyard with 5,1% and Liepaja Shipyard with 3,9%. 31% of all net turnover gets the rest of the country's companies.

Most companies are involved in the construction of sports boats and small recreational vessels, as well as yachts. In different years, they accounted for 70%–85% of the total number of industry companies engaged in the construction of vessels and boats. Between 2005 and 2016, the total number of enterprises operating in the shipbuilding industry in Latvia increased despite the economic crises that occurred between 2008-2010 and 2015-2016 (Aļievs et al., 2017).

The number of permanent employees in this industry in Latvia is more than 1 thousand people in 2018, but during the spring and summer season (usually during the warm months: april-september, the number of workers increases in 2-3 times (Aļievs et al., 2017). The total number of enterprises varies from 40 to 50 in the period from 2010 to 2018. The largest enterprises of the industry (Riga and Liepaja Shipyard) annually pay taxes to the state budget in the amount of about 300 ths. €. The number of permanent employees at these plants is about 750 people on average.

The leading enterprises of the industry have business contacts with more than 15 countries. Ship repair and modernization relationships are settled with the ships coming from all over the world. But when it comes to shipbuilding, there are mostly Scandinavian orders. There are also specific countries with whom Latvian shipbuilding and ship repair companies are mainly working and have good relationships:

- Russia – Russian ships were mostly repaired until 2000, but after Latvia joined the European Union, the situation has a little bit changed and nowadays Russian ships are being repaired less and less frequently. However in Liepaja, Tosmare Shipyard is still working with Russian ships. The shipbuilding relationships between Latvia and Russia are not affected so much by the political factors but rather from financial reasons. The settlements between the two countries are made using the Euro as a currency. Thus the exchange rate between the Ruble and the Euro is of critical importance for any project to be valuable or extremely expensive. (Eriņa, 2016);
- Many European countries (Greece, Cyprus, Denmark, Germany, Finland, Sweden, Norway, etc.);
- Non European countries (Panama, Cambodia, etc.).

3.2 Relevant problems of the industry

In order to ensure a possible sustainable development of the shipbuilding and ship repair industry in Latvia, it is necessary to provide a high enough level of competitiveness for successful functioning in global markets. To achieve this level of competitiveness, it is necessary to identify all existing problems of the shipbuilding and ship

repair market and to address them. Following a thorough analysis of the shipbuilding and ship repair industry, the authors identified five (5) important issued that need to be eradicated.

The very first problem lies in the deplorable situation with some of the main leaders of ship repair companies of the past years – JSC Riga Shipyard and its acquired company JSC Tosmare Shipyard. The problem is that the Riga Shipyard, the company that has been operating since 1913, recently (namely, since 2014), has found itself in a series of ongoing legal disputes. One of the proceedings was being investigated against one of the former board members since he did not perform his duties in good faith, causing losses to the company. The second trial went on with two companies that were subcontractors, because they believed Riga Shipyard haven't paid for the work done, but the company did not agree (Chairman of the Board of Riga Shipyard Jānis Skvarnovičs, 2016). Of course legal or financial problems create barriers for any positive performance and company development, as most of the company resources are utilised in an effort to solve them. The latter can be observed from dropped of its market share. The company hold in 2013 around 60% and the market share and in 2019 that share fell to 19%. Loss of market share can also be seen by other Latvian companies such as Tosmare Shipyard – in 2013, its part was 7.3% but in 2017 it was only 5.1% (Firmas.lv, 2018).

Unfortunately there are allegations that problems faced in the past still exists causing additional damage to the company. The former Head of Shipbuilding Dpt Gennady Slyozkin pointed out that less clients want to repair or build the new ships in Riga Shipyard, because of the absolute loss of reputation (Sergejs Gerasimovs (Latvian Television), 2018). Customers show more trust in shipyards from Klaipeda, Gdańsk or Tallinn than on those in Riga. Moreover, since December 2017, the employees have not been paid a regular salary, so they retire voluntarily (they employ four hundred employees and three hundred subcontractors) and the outstanding amounts owed to the state and employees has exceeded 1.7 million euros (Sergejs Gerasimovs (Latvian Television), 2018).

Concerning the previously mentioned situation, on February 19th, 2019, the court initiated insolvency proceedings of the shipbuilding and ship repair company "Riga Shipyard", but on March 20th, 2019, the court resolved to initiate the legal protection proceedings of "Riga Shipyard" (The Board of Directors of AS "Rīgas kuģu būvētava", 2019). Besides that, Kurzeme District Court in Talsi on August 9, 2018 declared "Tosmare Shipyard" insolvent as well. Their shares were removed from the Nasdaq Riga stock exchange in October 2018 (Liepajniekiem.lv, 2019). In such a situation, there is no question of any potential development and a bright fate of the former leading companies in foreseeable future – Riga Shipyard and Tosmare Shipyard.

The second big problem of Latvian shipbuilding and ship repair companies (and to a greater extent it concerns those enterprises that began their work before the independence of Latvia, namely during the USSR times) is that the most of the equipment and machinery is clearly outdated and have not changed over the years. Companies are still using old, low-tech, production equipment that is incompletely adapted to modern requirements. However, in order to maintain successful operation in the conditions of todays business, shipbuilding and ship repair companies in Latvia should constantly improve their products and increase their quality. That means introducing improved materials for ships, manufacturing and new repair technologies, machinery, current patterns of industrial activity, etc. Unfortunately, the problem regarding old equipment and technology that requires replacement is an issue that almost all shipyards are faced with.

The third problem is the lack of the ability of Latvian shipbuilding and ship repair companies to accept large vessels. This issue is causing high concern, especially if the results of the analysis of the maritime traffic market are taken into consideration, that highlight that as the economic prosperity increases there will be more demand for sea transport. This means that it will lead to the need to build new, more powerful ships, as well as to the increase in wear and tear of both ships and their technical equipment, and, accordingly, to a greater demand for ship repair services. And since lately Latvian shipbuilding and ship repair companies are already not so popular as they were in the past, foreign shipping companies will more likely sent their vessels for repairs to more modern shipyards situated in Klaipeda or Gdańsk (since the Baltic Sea shipbuilding and ship repair companies are almost about the same level in terms of price, speed and quality). Thus, Latvia needs to act fast and expand its technical capabilities of its shipyards in order to keep up with the competition. In order to highlight the importance of the latter, we should consider some key variables that affect the market, such as, the size of the vessels that enter Latvian internal waters, the sizes of vessels that operate in the Baltic Sea and compare them with the maximum size that Latvian shipyards can accommodate.

It is important to mention here that the maximum sizes of vessels that operate in the Baltic Sea are known as Baltimax vessels. Those vessels exists because there are a number of constrains entering the Baltic Sea. It is the Great Belt route that allows the largest vessels, with a draft of 15.5 meters and an air draft of 65 meters (limited by the clearance of the east bridge of the Great Belt Fixed Link). The length of the ship can be around 240 m and the width around 42 m. Nevertheless, there are also certain larger ship types plying the Baltic sea. Particularly the so-called B-Max-crude oil tanker with more than 205.000 tons deadweight (68 m width, 325 m length) and the Maersk Triple E class container ship (400 m length and 165,000 metric tons deadweight) (Content from Wikipedia, 2018).

Secondly, with regards to vessels' size, the maximum size of vessel ever entered the Latvian waters was the cruise ship called "Symphony of the Seas" owned by the company "Royal Caribbean International" in 2018, entering the Port of Riga and which is 18 decks high, 362 meters long and 228 thousand tons heavy ship (Marta Rožkalna, TVNET, 2018); and the "Hrvatska" tanker, calling at the Port of Ventspils in 2017, wich is 281 meters long and 48.2 meters wide, the ship's carrying capacity is 166,447 tons (TVNET LETA, 2017).

Taking into consideration the sizes of those two vessels mentioned above (although those are considered to be the "extremes"), it becomes clear that there is no Latvian shipyard that can accommodate such vessels to provide repair services, since the maximum size of the largest shipyard in Latvia (Riga Shipyard) is 240 meters in lenght and 42 meters in width for afloat repairs (Riga Shipyard, 2015).

The fourth problem regards the lack of political interest by the Latvian government to assist the industry. Unfortunately, historically there is no much evidence that the government took any kind of initiative to support the sector, mainly because it seems to be more interested in the supply chain and its port operations. Leaving the shipbuilding and repair segment of its maritime industry on its own to fight for its survival or get extinct.

This last notion could have been an overstatement, however this industry which is in a way an industrial sector, is not included in any of the national development programs. It should be highlighted that these type of businesses do not belong below any of the Latvian Ministries, which it comes as a surprise, since Latvia is considered as a Maritime State. Latvia ranks 4th among the European Union Members on absolute numbers of active seafarers, but also if someone considers the percentage of active seafarers to the overall number of the country's workforce (Maritime Administration of Latvia, 2018).

The last problem, lies in the fact that the shipbuilding and ship repair sector in Latvia is currently understaffed at all levels. If speaking about the top rank employees availibility in Latvia, then the only maritime institutions, that provide the country with the high- level specialists in such a narrowly specialized sector as the maritime sector are Liepaja Maritime College and Latvian Maritime Academy. But unfortunately, they are teaching only ship specialists (navigators, ship engineers and ship electrical engineers) and do not prepare shipbuilding specialists, so practically all major specialists of the company have acquired education in another country. The problem is worsened because the actual specialists are not getting younger and there is a high risk of losing precious know how. Currently, the average age of workers in factories is large enough and unfortunately the generation change does not happen as it should happen. Therefore, companies are forced not only to think about the survival and about the possible situation when one or another of these professionals will retire, but also look for a solution to this problem. Fortunately, they already have some options. For example, the solution of Riga Shipyard is that the company is sending its specialists to get the experience from the qualification courses (basic, specialist, higher professional training) at their own expense (Chairman of the Board of Riga Shipyard Jānis Skvarnovičs, 2016). Although sometimes it happens that the part of them stay and continue to work in the factory, but another part work only within the contract time and after it expires, find another work. That's why the preparation of specialists for enterprises is a problem. This also relates to mid-level specialists such as welders. They should not only be the good welders, but also good shipbuilders. For example, for Riga Shipyard welders, there is their own educational center, where these specialists are being trained. As well as the companies are trying to bring people in from the outside. For example, good shipbuilding technologists are being trained in Odessa and they are very happy to accept job offers from Latvia because shipbuilding industry in Ukraine has stopped practically (Skvarnovičs, 2016). Companies provide Ukrainean students with an internship and offer jobs after their graduation.

4 Material and Methods

This research is based upon the primary data offered and translated by a Latvian researcher upon authors' request and the formation of the end material into a modern business report. For this reason, the methods of SWOT analysis and Risk analysis are elected to offer a clear structure and categorise the end material into distinct segments.

The SWOT analysis consists in identifying the strategies that lead to competitive advantage through the strengths and weaknesses of an organization in order to seize opportunities and neutralize the threats of the environment. This SWOT analysis on shipbuilding industry is based on collection field data, primarily from the public data of the Latvian shipyards (Teoli et al., 2019 & Helms et al., 2010).

The proposed Risk analysis as based upon a risk matrix, stating and categorizing the risk types into distinct segments (political, social,, ecological etc.) and then evaluating the risk based on three factors: i) Risk level, ii) Probability of undesirable outcome of risk, iii) Extent of possible damage and classifying it as: i) low, ii) medium, iii) high probability status to emerge. Finally, specific risk reduction activities are suggested for each risk type (Salleh et al., 2014, Vose, D., 2008, Xuan et al., 2011).

4.1 SWOT analysis of Latvian shipbuilding

Table 1 SWOT analysis

Strengths	Weaknesses
• Good quality of Latvian shipbuilding and machinery. • The highly-qualified specialists are employed, both in the shipbuilding and ship repair enterprises. • The advantageous location of Latvia – between Western Europe and Eastern Europe (between Europe and Russia+CIS countries). • Skills, knowledge, and experience of the workforce is being certified by DNV, Lloyd's Register, RMRS, BV, GL etc. • Latvia has certified laboratories which executes tests of the materials used in repair in accordance with the requirements of the respective register society. • Latvia has one of the largest shipyards in the Baltic States. • Flexible production line able to adapt the requirements of the owner. • Specialisation in niche markets, e.g. specialization on yachts building/luxury yachts building. • Focuses on good quality of work, reasonable prices and long-term cooperation.	• Latvian shipbuilding industry has faced considerable problems due to economic depression in shipping industry, as well as the recession of overall trade and commercial fleet in the last five years. • Tougher competition due to Asian shipbuilding nation's dominance (China, South Korea, Japan). • Shortage of mid level management and skilled workforce in Latvian shipbuilding and ship repair industry. • Reduction in orders. • Lack of appropriate educational programs in regards to shipbuilding and ship repair industry in Latvia. • Gradual aging of the best personnel in the Latvian shipbuilding industry. • Latvian government does not support the shipbuilding and ship repair sector at all. • Lack of adequate funding for the introduction of new technologies and innovations. • Predominance of both an old equipment and old factory premises. • It is impossible to accept large vessels in Latvian shipyards
Opportunities	**Threats**
• Continuously improve the quality of services provided. • From time to time to make the introduction of new technologies, materials, to pursue innovations and improvements. • Introduction of new services. • Participation in exhibitions of marine technologies and innovations, thus promoting the national shipbuilding and ship repair enterprises, which can help to take things to the next level in the future. • The domestic ship enterprises can pay more attention to the industry market research. • Government policy, national maritime strategy and other supportive measure can help the local shipyards to survive and recuperate in the global market. • Introduction of a new educational program related to shipbuilding industry and further cooperation between the shipyards and students. • Prospects of specialization on green shipbuilding.	• The overall increase in operational costs in response to the increased prices for materials, equipment, commercial premises, average wages of employees, etc. • The deterioration of the economic situation in the country. • Reduction in the number of clients. • Tough competition with other shipyards situated around the Baltic Sea. • Productivity remains low and it is difficult to achieve higher quality standards by Latvian shipyards, as compared with leading shipyards. • Shortage of construction supervisors, mid level managers and specialized shipyard personnel. • Price competition in light of economic crisis. • Bankruptcy and liquidation processess of one of the leading shipbuilding and ship repair enterprises in Latvia. • Changes in existing laws leading to unfavorable conditions for the development of shipbuilding in Latvia.

Source: Authors

4.2 Risk analysis of shipbuilding/ship repair company in Latvia

Table 2 Risk analysis of shipbuilding/ship repair company in Latvia

Types of risks	Risk	Risk reduction activities	Risk evel (Low, Permis-sible, High)	Probability of undesirable outcome of risk (Low, Medium, High)	Extent of possible damage (Low, Medium, High)
Political risks	Various economic sanctions (aimed at the company itself, at companies of their clients or at the countries they are working with).	Keep up with all the new changes in the country's economy, politics and finance.	High	High	High
	Upheaval		High	Low	High
Social risks	The possibility of strike of workers at a particular company or in solidarity with other organisations.	Continuous motivation, support and encouragement of every employee, a bonus system creation.	High	Medium	Medium
	Conflicts between the people involved in the project.		Permissible	Medium	Low
	Wrongly selected specialists.	Find new partners and choose only those in whom you have confidence.	Permissible	Medium	Medium
	Poor relations with the environmentalists.	Always think about possible damage to environment.	High	Medium	Low
Commercial risks	Refusal of customers from already finished products and to pay for all work performed.	The provision of benefits, the fulfillment of the client's wishes, alertness, securely drawn up transaction terms.	High	Low	High
	The new firms attempting to enter the market, a great competition.	Introduction of innovative and unique qualitative services.	Permissible	High	Medium
Financial risks	Partial or total refusal of customers to pay in time for the work carried out due to various reasons.	The commencement of trial.	High	Medium	High
	Unforeseen expenses.	Keep track of stock levels and replenish them in a timely manner, as well as create a plan for monitoring of equipment.	Low	Medium	Low
Production risks	The inability to execute the order in time due to various reasons (project documentation is not ready; raw materials are not received in the required time frame, lack of specialists, etc.).	Designate a person responsible for following the development of the process step by step.	Low	Medium	Medium
Technical risks	Violation of production technologies.	Always monitor the condition of machinery, equipment and final products.	High	Low	High
	Product or equipment defect.		High	Low	Low
	Technological accidents.		High	Low	High
	Failure to comply with safety regulations.		Medium	Low	Medium
Ecological and risks	Technogenic accidents, such as: fuel, lubricant spills, etc.	Regulation and control of hazardous wastes, industrial chemicals and other harmful substances.	High	Low	High
Risks of changes in legislation	Changes in the tax system.	Keep up with all the innovations in the country's economy, politics and finance.	High	Medium	Medium
Unfortunate accidents	Unexpected natural disasters, like earthquakes, storms, hot weather.	Both compulsory and voluntary insurance should be used (property, health, life, interests and obligations).	Permissible	Low	High
	Theft, damage.	Alarm, video camera, fire safety and security system installation.	Permissible	Medium	Medium
	Fire		High	Low	High

Source: Authors

5 Results and Discussion

5.1 Development strategy

In order to find solutions to all the above-mentioned relevant problems of the shipbuilding and ship repair industry in Latvia, it is necessary to analyze their scale and find the most rational possible improvements. It would be quite logical to start with the most realistic and relatively easily achievable, but at the same time high-cost task, namely with improvements in the technical characteristics of shipyards.

The first thing all the shipbuilding and ship repair companies need to understand is that it is impossible to organise good production conditions in old premises. Therefore, a very important problem is the construction of new and major repairs of existing production buildings and structures, because every second facility in Latvia was built over 30 years ago, during the Soviet Union times. Unfortunately, this requires large financial costs, but it is a very important factor in increasing the competitiveness of enterprises.

The second thing is also important, since the production of modern competitive products is impossible without the use of new materials and technologies. The use of such materials reduces the cost of the operation of ships, as well as facilitates their maintenance. Although these materials are primarily introduced at the world's leading enterprises (e.g. shipyards in China, South Korea, Japan), increasing the competitiveness of Latvian shipbuilding and ship repair industry enterprises is also impossible without the use of these novelties. The introduction of new materials and technologies should be based on the use of modern equipment and machines in the production, and this is the next possible improvement.

The truth is that to achieve a good position in shipbuilding and ship repair markets, companies of these industries in Latvia should move to a higher level of economic growth corresponding to the innovations in equipment and machineries and renewal in a number of technical things because taking into account the growth of maritime transport in the world, this is one of the promising areas (Aļievs et al., 2017). It is necessary for Latvian market to continue producing high-tech products that will be demanded in international markets and will compete successfully with similar products from other countries and regions, such as luxury yachts, fishing vessels and patrol vessels. The innovation needs to be implemented in order to pay off the investment and to have a positive effect, higher performance. Such innovative equipment will allow performing technological operations more qualitatively and efficiently, improving the working conditions of personnel. As a rule, modern equipment is computerized, programmable and requires appropriate high qualification of employees. Technological chains are usually organised in modern production, when the results of the work of designers and technologists in the form of appropriate programs enter the workshops and control the operation of the equipment. The introduction of such equipment enhances the overall production culture and ensures the achievement of a higher level of competitiveness of enterprises.

In fact, updates should concern not only technological issues, but also human resources issues, i.e. those people who will work with the new technologies and machineries, because the purchase of new equipment and machinery, as well as the introduction of new advanced technologies in shipbuilding and ship repair are not possible without the direct involvement of highly qualified, creative and motivated specialists. The main issue for all enterprises of the industry is the need to create conditions for investment and innovation development, which is impossible without the support of high-quality human capital (Skvarnovičs, 2016). Therefore, there appear a few possible development scenarios, because it is obviously necessary to improve the skills of employees. For example, enterprises can send employees to special additional courses both in Latvia and in other countries advanced in the necessary spheres. In addition, it is possible to conclude agreements on the targeted training of employees with state education institutions in Latvia, but before that it would be good to introduce new educational program in any of the specialized in maritime spheres education institutions of Latvia, based on training of the shipbuilding specialists. There is still a possibility to invite to work of highly qualified specialists from other countries, although it is only a temporary measure to overcome the difficult situation. The best option is "cultivation", the education and training of one's own qualified personnel (Sudostroenie.info, 2018).

But unfortunately, there is "one important but", that interferes and casts doubt on the question of the positive outcome of all innovations, novelties and new educational programs in Latvia, and its name is a huge competition. As geographically Latvia is located in Europe, it needs to consider the fact, that the 10% largest European companies represent 92% of turnover and that shipbuilding in general is an important and strategic industry in a number of EU countries (European Comission, 2021). As well as, all these companies represent countries with economies stronger than in Latvia, so it means that it could be very difficult for Latvian enterprises to get into this 10%.

Anyway, the time goes on, the fleet is aging and the need to update the world fleet regularly becomes necessary to everyone. One of the potential opportunities in order to provide a new ship services can be a ship recycling industry, which has not been practiced in Latvia before, but can be realized and promoted as a safe and according with all the precepts services.

Next opportunity is related to another niche in which Latvia could take a big part. It is connected with environmental issues, because increased requirements imposed on the quality of ships still remains and will not lose their relevance. It is said that the growth in demand for the new

eco friendly ships is expected to be, since one of the International Maritime Organization's Committee approved a limit on sulfur content in marine fuel outside the ECA area of 0.5% since 2020, as well as on nitrogen oxide emissions from ships since 2021. It means less harmful emissions to the environment, less CO2 emissions from ships and less greenhouse gas (GHG) emissions into the atmosphere. In order to meet these requirements it will require the development and introduction of new technologies, improved machineries, introduction of more energy- efficient technologies and energy efficiency innovations. It is a very important resolution, since shipping CO2 emissions are projected to increase by 50% to 250% in the period to 2050, despite fleet average efficiency improvements of about 40%.

Next opportunity concerns another niche in which Latvia could take a big part. It is related to environmental issues, because increased requirements imposed on the quality of ships still remains and do not lose their relevance. There is expected the growth in demand for new eco friendly ships and for ships with high quality new operating systems in terms of smart functioning, energy efficiency, environmental safety, etc., since one of the International Maritime Organization's Committee approved a limit on sulfur content in marine fuel outside the ECA area of 0.5% since 2020, plus on nitrogen oxide emissions from ships since 2021, and also because of regulations made by other national and international institutions, such as: maritime registers, safety, environmental and crew qualification organizations, and etc (ECORYS, 2015).

All these regulations mean less harmful emissions to the environment, less CO2 emissions from ships and less greenhouse gas (GHG) emissions into the atmosphere. In order to meet these requirements it will require the development and introduction of new technologies, improved machineries, introduction of more energy-efficient technologies and energy efficiency innovations. The requirements for the production of efficient and environmentally friendly marine engines will increase. Shipbuilding-related industries will also develope rapidly: new materials for marine equipment, electronics, electrical appliances, computer navigation systems will be developed at an accelerated rate. It is a very important resolution, since shipping CO2 emissions are projected to increase by 50% to 250% in the period to 2050, despite fleet average efficiency improvements of about 40%. Into the situation like this, if Latvia act quickly and develop one or more relevant technologies and offer its services to the whole maritime industry or take part in some EU projects, like LeaderSHIP 2020 Initiative, which was developed in response to the effects of the economic crisis on the shipbuilding sector, then it could be an excellent option to become a highly specialized country in such a narrowly defined spheres.

But shipbuilding and ship repair enterprises should never forget about its own government. It would be good for Latvia to reconsider its priorities in relation to the shipbuilding and ship repair industry and finally understand that it is the same part of maritime industry as ports. Taking into account the global trends in maritime transportation and Latvia's experience in maritime transport, ports and shipbuilding and ship repair sectors, Latvia as a country need to believe that these sectors could be further developed by introducing successful innovations. If to compare the amount of the scrapped ships and the ships built in the same period, then the dynamics of growth is evident, indicating the development of shipbuilding in the world.

5.2 Marketing strategy

Statistics of Latvian shipbuilding and ship repair industry shows that the number of employees and sales volumes are closely related to changes in the economic indicators in general and depend on the trends of the world economy. Some examples include the world economic crisis 2008-2010 and the situation with the billateral sanctions against Russia in 2015-2016, which significantly worsened the key indicators of the sector, as well as the economic indicators in general. That is absolutely natural because the shipbuilding industry is closely integrated into the world economy; the products are exported and imported, competitors and potential clients are all over the world. In order to stay afloat, all these serious and risky situations should be thoroughly monitored.

Employees of marketing departments are one of those, who play a big role in the fate of the entire company, since it has been found that the most topical directions of development of worldwide shipbuilding industry are the development of workers' skills and improvement of the marketing system. Fierce competition in the world markets for shipbuilding and ship repair products substantiates the great importance of skilful search for profitable customers for the enterprises of the industry and long-term prospects, so the work of marketing departments should be constantly improved.

It is necessary to improve marketing systems, use modern methods of communication and business negotiations, for example, direct marketing, actively explore new sales markets around the globe, including the most remote regions. It is also useful to attract external consultants and establish cooperation among companies of the industry. Conducting market research, search for potential buyers of new products already at the stage of designing and manufacturing of samples of goods are the key to business success in the context of fierce competition.

At the designing stage, this allows taking into account the individual needs of customers, thereby improving the competitiveness of products on the markets. In order to introduce novelties and innovations, it often requires the search for new customers and expanding sales markets, therefore, it is very useful for Latvian shipbuilding and ship repair companies to regularly participate in specialized exhibitions devoted to metalworking, shipbuilding, ship repair, manufacturing of individual parts and components of a ship, special equipments, etc.

Companies must be clear on their market environment, the competitive advantages of the company, analysis of similar products of competitors, price adjustment, etc. The analysis of competitors' activities, knowledge of their products and strategies also play a strategically important role in strengthening the position of enterprises in the markets (Aliev et al., 2017).

6 Conclusion

In view of the above, it could be undoubtedly concluded that the shipbuilding and ship repair industries in Latvia were, are, and will remain an important piece of worldwide market. Since the ancient times, and especially since 5th century, the Daugava river was involved in international trade route between the Baltic and the Black seas. Latvians were excellent seafarers and made a huge contribution to the history of ships, boats and other floating constructions building. Nowadays, for a small but seaside Latvia, is very difficult to compete with the unsurpassed industry leaders, such as: China, South Korea, Japan, European Union, Indonesia and Philippines. Shipbuilding industry in all before mentioned countries and EU, is a dynamic and competitive sector and it is important in economic, social, transport, security, energy, research, and the environment perspective. For example, Europe is a world leader for a wide range of products ranging from propulsion systems, large diesel engines, environmental, and safety systems, to cargo handling and electronics. Within Europe, it is also difficult to compete with four countries dominating the field in ship construction: Germany, Italy, the Netherlands and Romania.

But despite that, Latvia has many positive features for shipbuilding and ship repair development: i) It has an advantageous location – between Western Europe and Eastern Europe (between Europe and Russia+CIS countries), ii) The highly-qualified specialists are employed, both in the shipbuilding and ship repair enterprises. Their skills, knowledge, and experience of the workforce is being certified by DNV, Lloyd's Register, RMRS, BV, GL etc. Latvia specializes in niche markets, e.g. on yachts building/luxury yachts building, which gives an excellent option to become a highly specialized country in such a narrowly defined spheres.

The positive aspects of Latvian shipbuilding follow positive and consistent development paths and take advantage of the opportunities presented. But unfortunately, there are also a lot of problems, weaknesses and threats, which directly hinders and hampers the potential development strategy. With a risk assessment and teamwork of both enterprises and their marketing departments, it may be possible for Latvia to find its own niche and core specialization and finally break new ground. Because of the fierce competition in the world markets for shipbuilding and ship repair products substantiates the great importance of skillful search for profitable customers for the enterprises of the industry and long-term prospects, so the work of marketing departments should be constantly improved. Clearly, to survive difficult times and truly change something in the old way of management of shipbuilding and ship repair companies in Latvia, many plans need to be carried out, e.g. i) make major repairs of existing production buildings and structures, ii) use more new materials and technologies, iii) introduce innovations in equipment and machineries, iv) solve human resources issues, v) possibly focus on more specific shipbuilding products and technologies such as luxury ships and upgrade ships to ice class classification, a trend on the rise in the area.

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