Big Boy Enterprise

Final Year Report

Group 16

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Introduction

Company Idea

Our company's goal is to identify and fill a market gap by taking a medium risk and making a medium-high profit. We work hard to reach our clients' goals. According to this, we want to be a reliable and trustworthy company.

Company Mission

Big Boy Enterprise is a profitable business for investors because our mission is to employ specific and qualified means that are primarily designed to operate in environments where few competitors can. Our company strives to be very active and reactive in the market, never failing to meet our obligations on time. With this approach, we will gain experience and constantly improve and expand our service. We offer dependable and consistent shipping services. The company now consists of two ships that sail across the world carrying significant supplies. BBE aspires to become a large fleet that sails all over the world.

Followed Strategy

Our strategy planned in the business plan received some setbacks and changes at the beginning of the operating year. Despite the fact that the initial planning was not possible, our company reset the strategy according to the market availability of contracts and ships for sale, assisting the best solution in order to secure the planned profits and revenue of the business plan.

The company's plan has been to start small with a single ship taking on a variety of contracts in the regions surrounding Europe, ignoring northern European ports seeking ice class, in order to avoid severe penalties since our ship from the Indian Ocean lacked the right class.

A ship's requirements include location, floor strength, carrying capacity, and pricing. BBE's approach makes operations highly dependent on the behaviour of other competitors, therefore the market is continually monitored for competition and the strategy is adjusted accordingly. The available contracts are evaluated depending on their profitability and potential to be delivered by the fleet's ships.

This is based on factors such as the potential of finishing the contract on time, the needed floor strength and volume, and the additional expenditures incurred to reach the start port. The destination of a contract is also considered, because some ports practically never have successful contracts departing from them, creating an additional risk for reduced revenues. Furthermore, the strategy includes gradually expanding the fleet to sail in a market that is still devoid of competition, which led us to the decision to purchase a new vessel with nearly identical characteristics, but with the primary goal of responding to the first ship during her maintenance period.

Figure 1: BBE highlight year1

Board of directors

Development over time

As previously mentioned in the introduction section, at the very beginning we encountered some difficulties while buying the ship. Our focus was specifically at two Handymax ship: number 49 and 42. However, other competitors was interested in the same ship as well, thus we were not able to buy none of them. Looking for new ship without requesting any loan, because of no other possibilities, we decided to buy a 30 years old Handymax (Handymax 47) located in Mumbai and with only 202 days before docking. Furthermore, this ship had a low value of maximum floor strength of 10 $[\frac{t}{m^3}]$ and no ICE-class certification. Compared to our initial plan, the characteristics of this ship did not comply to our plans, however we decided not to change the size of the ship.

According to the Big Boys Enterprise strategy, the ship was moved from Asia to Europe, where many contracts were available. Indeed, in Europe a lot of short/medium term contracts with high rate were available compared to Asian market. The ship had to sail for 6 weeks in ballast condition before reaching Rotterdam: during this period, the ship did not produce any revenue. Due to that initial long trip in ballast condition, a considerable amount of money was spent.

Once the ship arrived in Europe, this maker resulted to be a good opportunity for high profits as it was expected. Despite that, an intense competition in the area was registered. Besides, the Handymax 47 did not have the ICE-class certification, thus it was not allowed to enter most of the North Sea ports if not with high taxes. Because of this reason, these destinations were avoided. However, the size and the number of contracts requiring ICE-class ship were not large, most of the available contract every week did not request this characteristic. Therefore, to obtain the highest possible loading rate of the ship, it was preferred to focus on other ports in central and Southern Europe.

After the sixth week, a considerable number of contracts were signed, providing constant profit to the company. It was preferred to sign Voyage charter contracts and not time charter since the ship had to be docked during the charter period, thus this option was not viable.

During the first weeks, it was decided to offer low bids for the suitable contracts in ordered to make sure to have a profit. This choice was made to avoid the ship to remain docked in a port without producing any revenue. However, during the year, it was clear that more profitable bids were also a viable option. More specifically for those contracts which required large cargo volume as the Handymax 47 could provide.
After 24 weeks, the income was still negative and the Handymax 47 needed to go to docking. Big Boys Enterprise had already planned such a scenario as plan B: the ship should have been repaired not in Europe but in Asia, mainly because of the lower prices. Due to this reason, the company looked for a contract between Europe and Asia since the beginning of the year.

The solution was identified in a contract between Rotterdam and Pasir Gudang: this route was not crowded at that time and no other competitors did a real offer for that contract. Thus, the ship was moved from Europe to Asia under contract, producing considerable revenue. However, once in Asia, the docking of the ship comported high costs (circa half a million) with no income for 3 weeks.

To prevent high losses, the company purchased a second ship without any loan. It was a Handymax ship (Handymax 44) located in Argentina with same characterizes of Handymax 47 and more than one year before docking. Despite the large distance between South America and Europe, the main goal remains the European market, as it was the most profitable market at that time. Furthermore, some contracts between Europe and North America were also available, and it was opted to offer a high bid with considerable profit. Therefore, the strategy changed, extending the main operational area from European market also to Europe – North America contracts.

However, as it happened with the first ship, a long trip from Argentina to North America in ballast condition was required with relevant loss of money due to the high cost of fuel.

This operation required a large amount of money to be carried out, however, the possible profit represented by sailing a ship in the previously mentioned area was higher than the expected costs.

Nevertheless, the main goal was to sell the second ship by the end of the year. Through this strategy, initial costs would be partially compensated.

Meanwhile, the Handymax 47 had to spend several weeks in the shipyard location because of a lack of contracts in that region. This caused a considerable increase in costs. Previous predictions regarding the availability of contracts in the Asian region were not respected, thus a sudden change in strategy had to be carried out.

The ship was moved to Singapore, where it was assigned a long-term contract to Europe: it lasted for more than 11 weeks. However, the bunker capacity was not enough to complete the entire voyage, thus 2 emergency bunker was necessary. Furthermore, canal fees and icebreaker fees had to be paid. Nevertheless, Handymax 47 reached the more profitable European region at the end of the year with a positive balance on this voyage.
Despite these costs, this operation perfectly respected the Big Boys Enterprise's strategy to operate its ships in Europe.

On the other side, the strategy of the second ship (Handymax 44) had to be changed due to the offered contracts in Europe. Once the ship was there, the competition drastically increased in this region, thus it was more challenging to get a profitable contract. The company opted for a longer contract from Europe to South Africa. This allowed the ship to sail to a less crowded market area with the intent to be sold. It was put on sale and sold at the end of the year.

Despite this sale causing a loss of assets for the company, it respected the initial strategy. Nevertheless, Big Boys Enterprise registered a negative balance, which resulted in the payment of penalty interest every week. This was an additional reason to sell the second ship (Handymax 44).

Internal factor

The most important decision taken by Big Boys Enterprise was to sail the ship to an Asian shipyard, far from the most profitable European market. The main goal was to reduce the price of repair while the ship was docked. However, these costs resulted to be not so relevant compared to the possible incomes of the European contracts if the ship had been in that region. Indeed, only few contracts were available in the Asiatic area, and all of them required long trips in ballast condition. Therefore, it would have been more profitable to accept higher repair costs in Europe in order to be competitive in the market as soon as the ship was out of the shipyard.

External factor

An unexpected change in the type of contract in the second half of the year occurred and forced the Handymax 47 to remain in the Asian/Far East region more than the planned time. Also, some long-term contracts with optimal size for Handymax 44 were available from Europe to Africa and USA. Due to this reason, it was preferred to change strategy from short term to long term contracts and from the European Area to all the Atlantic Ocean destinations.

Market Analysis

To provide a more specific market assessment of the first year, some indicators can be used. They consist in utility rate, freight rate and activity rate. Furthermore, costs and profits are provided in detail. Due to the market segment Big Boys Enterprise was interested in, a high value of activity rate was expected. On the contrary, due to the large size of the ship, high utility rates were not taken into consideration while sailing in the European region. It was rather required for long passages (e.g., ocean crossing). In conclusion, during the first weeks, the company preferred to maintain low freight rates to get as many contracts as possible.

However, this choice was not the best option, since profits were not high enough to compensate for

all the costs (including all the trips in ballast condition). More specifically, low rates had been a problem while transporting a small amount of cargo. Indeed, large quantities of cargo can compensate for low freight rates and vice versa.

Start Port	*End port*	*Distance [nm]*	*Weight [t]*	*Utility rate*	*Freight rate [$/t]*	*Payment [k$]*	*Profit [k$]*
Shanghai	Gdansk	11342	43479	1.00	29	1260	365
Rotterdam	Pasir Gudang	8313	51602	1.00	17	877	259
Dunkirk	Marseille	1952	27302	0.42	14	382	232
Rotterdam	Hamburg	305	16985	0.33	15	255	127
Wilhelmshaven	Rotterdam	247	6100	0.07	24	146	67
Marseille	Wilhelmshaven	2248	43229	0.51	9	394	200
Rotterdam	Marseille	2051	43479	1.00	9	391	153

Figure 2: Freight rate and Utility rate Handymax 47

Start Port	*End port*	*Distance [nm]*	*Weight [t]*	*Utility rate*	*Freight rate [$/t]*	*Payment [k$]*	*Profit [k$]*
Antwerp	Port-Gentil	4538	32325	0.63	22	711	451
Corpus Christi	Rotterdam	5111	63376	0.98	11	697	230

Figure 3: Freight rate and Utility rate Handymax 44

Time rate

As shown by 4, the ship resulted to be under contract for most of the time. The contract period also includes loading and unloading operational times. The ships also sailed in ballast condition for a considerable percentage of the time. It should be taken into consideration that sailing in ballast condition could be even more profitable than remaining in port since contracts mostly start from different locations. Therefore, especially when contracts have high rates, it is advisable to sail the ship among different destinations to get the most profitable contract.

Handymax 47 sailed under contract for a greater percentage of time compared to Handymax 44. This can be accounted to the difference in the time of the purchase. As previously described, during the first part of the year Handymax 47 was used mostly in the European market with frequent voyage charter contracts. On the contrary, during the second half of the year, both ships were mostly used for long-term contracts, which led also to long periods of ballast. Furthermore, due to a lack of contracts, both ships were forced to remain docked in the same harbour for weeks.

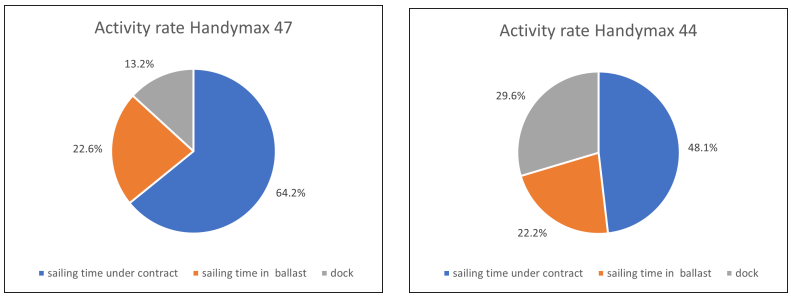

Figure 4: Time ratio

Cash Flow

The plot 10 shows the total cash flow. Four significant drops can be noticed: the purchased of the first ship at week 0 and of the second one at week 25, the slight decrease between week 29 and 37 due to shipyard costs and no assigned contract. Finally, from week 48 on, the value return positive due to the sale of the second ship (Handymax 44) and the payment of the last contract. However, profits were lower than the expectations. As predicted, BBE managed to buy two ships and at the end of the year one of them was sold, so these three big steps were expected. As shown in the line chart, during the remaining part of the year, the trend was almost steady instead of rising. The result was a total loss of -1.2 $ millions, whereas our expectations were to obtain a positive profit.

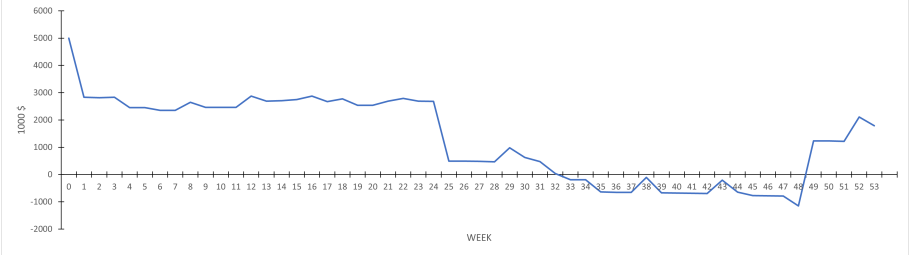

Figure 5: Total cash flow

EEXI - EEOI – CII

CII

The Carbon Intensity Indicator (CII) is a measure of how efficiently a ship transports goods or passengers and is given in grams of CO2 emitted per cargo-carrying capacity and nautical mile. The CII is based directly on the fuel consumption, which is influenced by how a specific ship is operated in combination with its technical efficiency and fuel. Its value will be affected by the type of fuel used, the efficiency of the vessel and operational parameters such as vessel speed, cargo transported, weather conditions and the general condition of the vessel.

$$Attained\ CII = \frac{C_f \cdot (\sum Cons_j - (0.75 - 0.03 \cdot y_i) \cdot Cons_{AE})}{f_{ice} \cdot DWT \cdot \sum d_j}$$

where C_f is assumed equal to 3.17.
The calculation does not include any reduction factor for ICE-class ship since both the ships are not ICE-class certified. Therefore, $f_{ice} = 1$ is assumed.

$$Required\ CII = (1 - Z) \cdot 4745 \cdot DWT^{-0.622}$$

where Z is assumed equal to 0 % since the year is 2022.

$$CII\ Rating = \frac{AttainedCII}{RequiredCII}$$

	$\sum Cons_j$ [g]	$Cons_{AE}$ [g]	DWT [t]	$\sum d_j$ [nm]	Att. CII [g_Co2/(t*nm)]	Req. CII [g_Co2/(t*nm)]	CII rate
Handymax 47	3.05E+09	9.13E+08	6.68E+04	3.78E+04	2.98	4.74	0.63
Handymax 44	1.10E+09	9.13E+08	6.68E+04	1.65E+04	1.20	4.74	0.25

Figure 6: CII Calculation

As can be noticed from 6, the $Attained\ CII < 0.86 \cdot Required\ CII$, therefore both the ships are classified as Major Superior. This is mostly due to long distances compared to an average low consumption of the engine.

EEXI

The Energy Efficiency existing ship Index (EEXI) is a measure introduced by the IMO to reduce the greenhouse gas emissions of ships. The EEXI is a measure related to the technical design of a ship. Ships have to attain EEXI approval once in a lifetime, by the first periodical survey in 2023 at the latest.

$$Attained\ EEXI = \frac{C_f \cdot (Cons_{@V_{ref}} + Cons_{AE})}{DWT \cdot V_{ref}}$$

where C_f is assumed equal to 3.17 and the speed at 75% is evaluated assuming that a cubic relation between speed and engine power exists.

$$P_{MCR} = c_1 \cdot v_{MCR}^3 \longrightarrow c_1 = \frac{P_{MCR}}{v_{MCR}^3} \longrightarrow V_{ref} = \sqrt[3]{\frac{0.75 \cdot P_{MCR}}{c_1}}$$

$$Required\ EEXI = (1 - X) \cdot 961.79 \cdot DWT^{-0.477}$$

where $X = 20\%$ sice DWT of both ships is between 20000 DWT and 200000 DWT.

	$Cons_{@Vref}$ [g]	$Cons_{AE}$ [g]	DWT [t]	V_{ref} [kn]	Att. EEXI [g_Co2/(t*nm)]	Req. EEXI [g_Co2/(t*nm)]
Handymax 47	1.28E+06	1.04E+05	6.68E+04	12.72	5.17	3.84
Handymax 44	1.27E+06	1.04E+05	6.68E+04	12.72	5.14	3.84

Figure 7: EEXI Calculation

The Attained EEXI of both ships is higher than the required ones. This could be accounted to the high average speed of the ship, which led to high consumption. In order to reduce the EEXI value, it would be necessary to reduce the speed of the ship.

EEOI

The EEOI, or annual fuel consumption divided by transport work, can be considered as the annual average carbon intensity of a ship in its real operating condition, taking into account actual speeds, draughts, capacity utilization, distance travelled, and the effects of hull and machinery deterioration and weather. In this case, the two ships which appear similar in their design characteristics can perform differently.

$$Attained\ EEOI = \frac{C_f \cdot Cons_j}{m_j \cdot d_j}$$

	$\sum Cons_j$ [g]	$\sum d_j$ [nm]	$\sum m_j$ [t]	Att. EEOI [g_Co2/(t*nm)]
Handymax 47	3.05E+09	3.78E+04	2.32E+05	0.00E+00
Handymax 44	1.10E+09	1.65E+04	9.57E+04	0.00E+00

Figure 8: EEOI Calculation

Financial Overview

Income statement

		Start Year [$]	End Year [$]
Revenues		0	5609261
	Voyage income	0	5609261
	Sales	0	2390000
Expenses			
	Voyage expenses	-132184	-3013131
	Bunker	-132184	-1403419
	Emergency bunker	0	-41626
	Port fees	0	-1351300
	Canal fees	0	-216786
	Penalties	0	-50000
	OPEX	0	-3404628
	Maintenance	0	-704100
	Insurance	0	-1176084
	Crew	0	-1124648
	Administration	0	-399796
	Financial expenses	-200	-514584
	Interest	0	-25940
	Depreciation	0	0
	Repairs	0	-483844
	Consultancy	-200	-4800
	Broker	-33379	-38379
	Tax	0	-4307
		0	-4307
	Sales	0	-4307
		0	-4307
Total		-165763	-1055768

Figure 9: Income statement

As can be seen, the total profits of the first year are -1.2 $ millions. We didn't expect to have such high financial expenses, increased by repair costs of Handymax 47 and penalty interest of the bank. A major item consist in a penalty for the cancellation of a voyage charter. We also had to pay an emergency bunker for Handymax 47 due to a too long trip at 14 knots, that is its maximum speed. Finally, we paid an extra fee because we entered the port of Gdansk without the ice class. All the other expenses, like OPEX, were expected.

Cash Flow statement

		Start Year [$]	End Year [$]
Voyage funds		-132184	2485154
	Voyage charter fees	0	5548285
	Bunker	-132184	-1403419
	Emergency bunker	0	-41626
	Port fees	0	-1199550
	Canal fees	0	-216786
	Penalties	0	-50000
	Ice breaker fee	0	-151750
Operational expenses		0	-3852341
	Maintenance	0	-704100
	Insurance	0	-1176084
	Crew	0	-1124648
	Administration	0	-399796
	Repairs	0	-447713
Financial funds		2935951	-2119999
	Received investment	5000000	0
	Vessel purchased	-2030670	-2027469
	Vessel sale	0	2385413
	Broker	-33379	-33379
	Tax	0	-4307
	Flag change	0	-28904
	Interest	0	-25940
Remaining expenses		-200	-4800
	Consultancy fees	-200	-4800
Total		2803567	-1106573

Figure 10: Cash flow

Its discussion and financial time-line have already been illustrated in the Board of directors.

Balance and Indicators

	Start Year [M$]	End Year [M$]
Fixed Assets	1.67	1.67
Bookvalue	1.67	1.67
Current Assets	3.20	2.08
Bank account	2.80	1.72
Debtors	0.00	0.00
Prepaid expenses	0.04	0.00
Inventory	0.36	0.36
Total	4.87	3.75

	Start Year [M$]	End Year [M$]
Equity	4.83	3.77
Running year	-0.17	-1.06
Accumulated profits	0.00	-0.17
Owner's equity	5.00	5.00
Liability	0.04	-0.03
Prepaid income	0.00	-0.06
Creditors	0.04	0.04
Total	4.87	3.75

Figure 11: Balance

A balance sheet is a financial report that summarizes a company's assets and liabilities plus owner's equity. The balance sheet refers to a given time and in our case has been calculated at the start and at the end of the year. It has two sides: assets, divided in fixed (ships) and current, which represent what we have, and liabilities that indicate how we financed our assets. Liabilities are divided in equity and debt. From the tables it is possible to see that obviously the total values of assets and liabilities are the same. It's important to note that we have a negative liability at the end of the year because the prepaid income has

a minus sign and its absolute value is higher than the M$ 0.04 of creditors. A negative liability typically appears on the balance sheet when a company pays out more than the amount required by a liability.

		Start year	End year
Working Capital	[M$]	3.2	2.1
Liquidity			
Current Ratio		72.7	-83.2
Quick Ratio		63.6	-68.8
Solvency	%	109.8	-150.8
RoE	%	-	-0.28
RoCE	%	-	-0.27

Figure 12: Indicators

- Working Capital:
  The working capital is given by the difference between current assets and current liabilities. In our case, not having a loan to finance the purchase of the ships, current liabilities are very low. Overall this indicator is mainly influenced by money that is on the bank account, being other voices of the current assets much smaller. The fixed assets remain the same both at the start and at the end of the year (one ship), because we operated with two ships only during the year. However at the end of the first year the Working Capital is lower because of less money on the bank account that negatively influenced the current assets.

- Liquidity:
  The liquidity of the company is expressed through the current ratio and the quick ratio, which express how fast the money can be extracted from the assets. The absolute values are greater than 2 both at the beginning and at the end of the year (both the current and the quick ratio), which means that the liquidity is too high. Therefore, we could have invested more money to get more debt. The difference between the formulation of the two indicators consists in the value of inventory and prepaid expenses, that are subtracted to the current assets for the quick ratio, since instant conversion into cash is not possible. Again, like for the Working Capital, the absolute value at the end of the year is different to the one at the start because it is influenced by less money in the bank account. However, in this case the indicator is higher because of its expression.

- Solvency:
  The absolute values of the solvency are far above 100%. This means the company is primarily financed through own capital. This is positive, because it means there are lower risks due to liabilities. This indicator shows the capability of meeting its obligations in case of liquidation, but in this case it is too high and, as said before, it is time to invest more money and get debt. At the end of the year the value is higher than at the beginning because even if the equity is reduced, the liability that is at the denominator of the fraction is much lower (change due to prepaid income).

- Rentability:
  The return can be expressed as a percentage of the total capital employed or of the equity. In the first case it is calculated with an indicator called RoCE, in the second case RoE. In our case, at the end of the year RoE is lower than RoCE. Besides the different denominators of the two indicators (RoE has equity and RoCE has total capital), they are also different because in the numerator of the RoCE there isn't simply the net profit, but its sum with interest and tax (Earnings Before Interest, Taxes, Depreciation and Amortization).

Future Outlook

Based on market assessments, BBE's first approach was to focus on short-medium term contracts with on the Europen area. However, it is obvious from this report that vital lessons were learnt throughout this first year, both in terms of ship operation and in a larger context of the company's strategy and the worldwide shipping industry.

One common misunderstanding was that having a busy ship was preferable than not having one. It may appears so at first, but everything must be carefully considered. Even if one picks the smallest cargo with the largest profit, this does not guarantee profit, as it has been the case in the past. The offer may be large, but with such a little cargo, the profits are minimal. Often, the cargo must be picked up in port from the present port, incurring travel costs and port taxes. If these aspects are not considered, they can reduce earnings and create significant losses. As a result, it is frequently preferable to wait in a port for the correct contract than transporting not profitable cargo.
The market for contracting ice classes was substantially lower than expected. Other requirements, like as floor strength and cargo volume, had a greater influence on the ships' operability in the end. As these severely limited specific cargo, it is feasible to operate without ice class at a greater cost.

The most essential operational lessons may be gained to transform loss into profit in short term contracts. First and foremost, only few contracts had delays in unloading the ship, therefore delays should be seen as a norm. It will be critical to determine if a load will fit in the ship while also considering the port limitations of all ports along the route. These physical limits are clear, but they should not be neglected. Delays cannot always be avoided, but other errors in this area should be avoided, even if it means longer waiting time due to the lack of a contract. Our approach should therefore not be centred just on locations with fewer competitors, but also on periods when fewer competitors seek for contracts with lower bids. Bidding on contracts at the correct time, especially when other ships are already under contract, should thus be considered. May expect that with so many businesses, competition would be severe, but this is not the case. The world is vast, and there are several regional marketplaces. The firms are dispersed around the world, resulting in a level playing field. There is no incentive to underbid in order to obtain contracts. And if one maintains a watch on the whereabouts of competing vessels, one may even offer the highest bid and win the contract. Identifying the opportunity to bid requires active operation and constant market monitoring. Active operations may be carried out by properly forecasting markets. Any new market requires more attention, since new markets require more time to analyse. Because of market volatility, management must constantly maintain a tight eye on present and future activities, but new markets will emphasize this demand. Knowing your ship's location may save you a lot of time in critical situations. Distinct cargo kinds have different requirements, such as iron ore, which demands a minimum floor strength of 15 tonnes per square metre, restricting transportation if your ship is not capable of transporting it. If the vessel's floor strength is known, all iron ore contracts may be examined or ignored systematically, saving a significant amount of time.

Furthermore, the small-medium volume market proves to be a high-risk market for Europe's competitors, since it is also a high-profit/costs market, and voyages take a long time to accomplish, putting a lot at risk at once. However, it appears that the market this year has ample opportunities to take on these risks and achieve bigger returns in the future. The objective is to grow the fleet with two or more ships best prepared to take on the future market as soon as BBE has restored adequate liquidity.

In a future game, it would be much better to purchase two vessels at the start rather than in the middle of the year, and loans for these purchases should be considered. Loans may appear to be a risk since they need interest payments, but they also reduce total risk. As previously said, having more than two ships may enhance the situation and profitability if handled properly and correctly. This should no longer be a concern now that the management has greater experience in these topics. Another key consideration is the vessel's age. While older vessels are inexpensive and do not depreciate, they require extensive repairs. As a result, while purchasing, this should be taken into great consideration. Other qualities such as floor strength, cranes, and so on should also be verified before purchasing. Further with gained expertise, the company will be able to better appraise contracts and arrange the boats, resulting in more profitable contracts with fewer voyages without cargo. But not only did our enterprise develop enhanced, but so did its competitors. As a result, one must be cautious and not overconfident.