ZIM INTEGRATED SHIPPING SERVICES LTD.

NOVA SCHOOL OF BUSINESS & ECONOMICS

A Work Project, presented as part of the requirements for the Award of a Master Degree in Economics / Finance / Management from the NOVA – School of Business and Economics.

ZIM - Staying afloat during the freight rate waves

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Abstract

The aim of this project is to develop an Equity Research report about ZIM, as well as providing a final recommendation related to its underlying stock. This project was conducted by me and my colleague Duarte Matos. Therefore, I recommend the reading of our consolidated report (annexed), to better understand our work.

ZIM is a global asset-light container liner shipping company with leadership positions in niche markets, operating a fleet of 87 vessels across five geographic trade zones – ranked 11th among shipping carriers globally, controlling approximately 1,6% of the global shipping capacity, according to *Alphaliner*.

Its *Blue Ocean* strategy regarding operations – essentially all vessels are chartered, brings interesting aspects regarding financial accounts, especially costs, as ZIM is able to adapt its fleet to answer demand. This will influence the fair value of the company and how ZIM will perform against its peers.

In the first chapter, we discuss the value drivers of the company and reasonings behind the forecast of the financial records. These are split regarding the Free Cash Flow map. Lastly, in the final chapter we computed the fair value of the share price, using the WACC and a Discounted Cash Flow model, which are explained in dept. The model returns a price that reflects our vision on the future of the company, nevertheless we conducted a sensitivity analysis in order to account for WACC variability, which impacts the fair value.

Keywords: Finance; Valuation; Shipping; Freight-rate; Asset-light; TEUs carried

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This report is part of the … report (annexed) and should be read has an integral part of it.

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Value drivers and Forecasts

Core Business Result Forecast

- Revenues

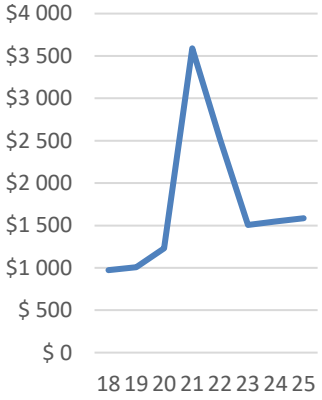
ZIM's revenue comes mostly from Containerized Cargo (87.48% of revenues in 2020), which refers to the transportation of cargo using standard intermodal containers. Nevertheless, there are also Value-Added Services, that includes the logistic and digital-wise offering of the company to provide a "door-to-door" delivery, on top of Containerized Cargo. As discussed on *Strategy – Digital-Oriented*, the technological developments ZIM has been undertaking will make Valued-Added Services more relevant, therefore we expect a rise in % of Containerized Cargo between 2020 and 2021 (14.91%).

As aforementioned, the revenues from Containerized Cargo drive from the freight rates practiced and the quantity carried, measured in TEUs (twenty-foot container unit).

Freight Rates

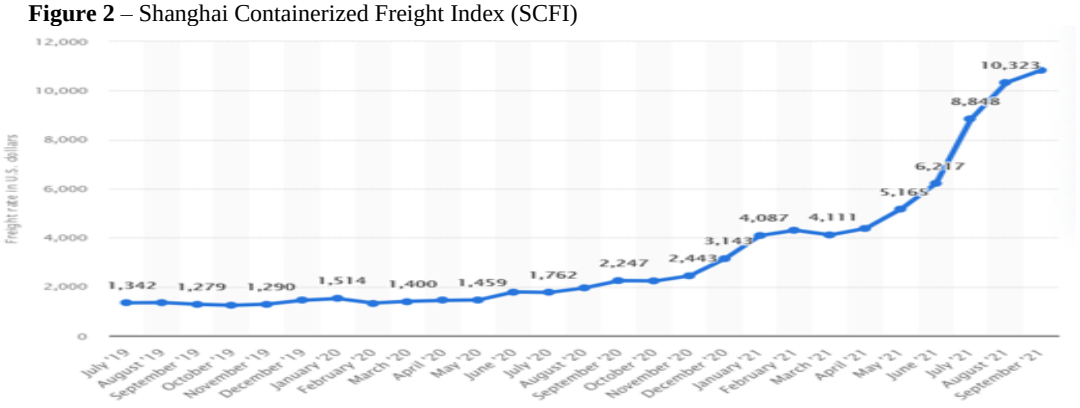
As a result of the high competition level of the shipping industry, companies have almost no influence on the freight rates, which are largely established by the freight market (the *Shanghai Containerized Freight Index* is used in this report, as an industry practise). Freight rates are extremely hard to forecast due to the numerous factors that impacts them (demand, supply, oil prices, port congestion, type of vessel and nature of goods, government intervention, location, seasonality, among others). With that in mind, we opted to forecast only the global revenues, using a global average freight rate based on the SCFI, instead of forecasting each trade zone. This option follows the philosophy "*the more estimations made, the more estimation errors".* According to the company report, the average freight rate in 2020 was $1229. To arise a reasonable growth rate for 2021, let us use the SCFI (Figure 2).

Figure 1 – Forecasted average Freight Rates



Source: Own Estimates

Figure 2 – Shanghai Containerized Freight Index (SCFI)



Source: Bloomberg

Figure 2 – IMF Inflation Forecast

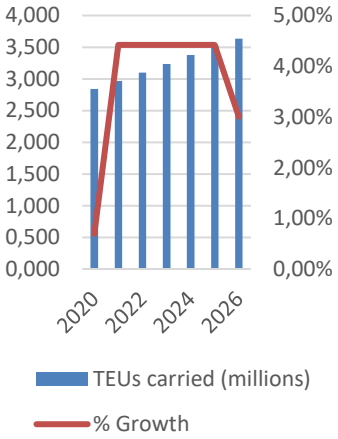
2021	2022	2023	2024	2025	2026
4,30%	3,50%	2,70%	2,60%	2,50%	2,30%

Source: IMF

We computed the freight rate by averaging the rates between January 2021 ($3143) and September 2021 ($10323), resulting in an average freight rate in 2021 of $3590. This calculation serves as proxy for the whole year, since we do not know how ZIM operated in detail regarding the massive growth of freight rates in 2021. Therefore, our freight rate growth for 2021 is 192.11%. As previously detailed in *Current Rates: What drives them?* We believe that these past and current years' volatilities will eventually tend to pre-Covid levels until 2024, mainly due to the expansion of capacity among shipping companies and returning to normality. Thus, a reasonable growth rate for 2022 and 2023 would be -30% and -40%, respectively. Also, major industry experts, such Daniel Richards from MSI underpins that "freight rates will not fall below pre-pandemic levels, (…) but will not be substantially higher after 2023."[1]. For the remaining years, we assume that the freight rate market will vary according to inflation (figure 2).

TEUs Carried

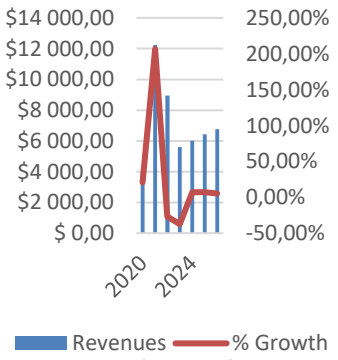
Figure 3 –TEUs carried Forecast



Source: Own estimates

We are convinced that the container shipping industry is concentrated as it is mature, with well-established players. Consequently, we reckon that it is unwise to anticipate great variations on ZIM's market share, on top of what was previously discussed in *ZIM's Strategy*. Therefore, this metric is influenced by worldwide demand rather than business operations. It is expected that sea transportation will remain the leader in bulk transportation, since it is the cheapest way of transporting goods across the world. In contrast, air transportation, even though it is outstandingly faster than sea carrying, it is as expensive. Not only, air transportation goods are likely to be in low quantity, thus it will be impossible to compete against the huge capacity sea freighting has. As said, TEUs carried for the future will follow the expected industry rise of 4.42%[2] as proxy for the CAGR for the period 2021-2025. The further years will have a growth rate embedded of 3%, which is aligned with the forecasted global GDP growth rate[3], respecting the correlation between the shipping industry and the world output. Having all in mind, we reckon that the industry is growing as a whole, so it is not expectable that ZIM can be outperformed by any competitor in terms of TEUs carried, relative to total capacity available.

Figure 4 – Total Revenues Forecast



Source: Own Estimates

Revenues Outline

Following the freight rate and TEUs carried forecast, revenues will have an astonishing increase in FY2021 (206.64% in comparison with 2020) reaching $12 239 million, mainly driven by the freight rate increase, since the quantity carried only increased 4.42%. In the next two years, revenues will tend to decrease to $5 605 million in FY2023, backed by the freight rate's decrease to slightly above pre-pandemic levels. From FY2024 onwards, revenues will follow the inflation

[1] Source: Reuters
[2] "Cargo Shipping Market" 2021 report. Source: MarketWatch
[3] Source: World Bank, HSBC estimates

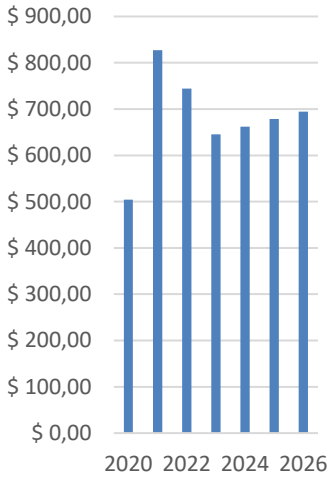
and the global GDP CAGR, reaching, from FY2026 on, the nominal long-term growth rate of the economy of 5.4%.

It is worth to highlight that freight rates and the TEUs carried are paramount in our vision and will influence how ZIM's financial records will perform in the future, as the whole business heavily depends on them. Also, by following the same approach, we reckon that revenues of container shipping companies will most likely differ based on capacity, which consequently impacts TEUs carried (since the freight rates are dictated by the market and not by each company). Therefore, as we do not predict significant variations in the industry's market share, the revenues of competitors should also grow at the same rate of ZIM's.

- Costs

Expenses related to cargo handling

Figure 5 – Cargo Handling Costs Forecast ($ millions)

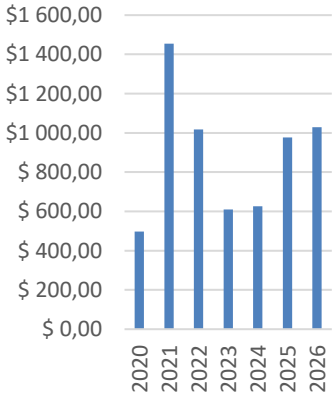


Source: Own estimates

Refers primarily the cost relating to the loading and discharge of containers, transport of empty containers, land transportation and transhipment of cargo charged by the ports. Historically, this s the most relevant expense in terms of revenue, averaging 40.48% of revenues from 2018 to 2020. We developed our own method to forecast this account since the industry is predicted to face abnormal years until FY2024, and this is the main operational cost that ZIM has. Assuming that approximately one third of these costs are correlated with the freight rates, we forecasted the future average costs per 1 million TEUs carried, adjusted by one third of the freight rate growth until FY2024, in order to better represent the industry reality. From FY2024 on, the average cost per 1 million TEUs carried is entirely adjusted to inflation. Cargo handling costs heavily depend on capacity (market share) since it justifies the bargaining power between each company and the ports. Consequently, peers like Evergreen and Yang Ming have and will maintain better margins n comparison with ZIM. On the other side, in the forecasted years, ZIM will keep outperforming competitors like Matson, as well as the rest of the companies that compose this industry, since it will remain its bargaining power as a consequence of its capacity.

Slots purchase and hire of vessels

Figure 6 – Slot purchase and hire of vessels Forecast



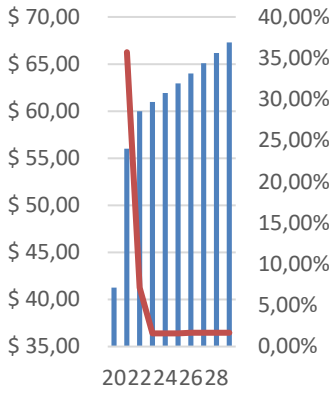
Source: Own estimates

Within the container shipping industry, it is usual for companies to purchase slots from each other, in order to fill a vessel's full capacity. In addition, ZIM's business model, as it soundly depends on vessel chartering, creates the hire of vessels expense – charges that the company pays to vessel owners for hiring their vessels. Besides, due to the nature of the hiring contracts, ZIM generally does not incur into additional costs for crew provisioning, maintenance, repair, or hull insurance with respect to these vessels, discarding the company from extra expenses. Due to the tight relation with the freight rate, until FY2024, the account is calculated in accordance with the rate increase. From FY2025 onwards, we assume a 15.20% of revenues that better represents the shipping industry reality. Comparing to its peers, this account is less impactfull to them (ZIM's

asset-light model versus owning their vessels) so the main difference is only the service fee paid by ZIM which is not relevant if we analyze the costs as a whole.

Fuel and lubricants

Figure 7 – Fuel Price and Growth Forecast



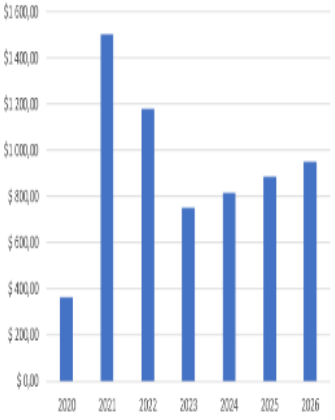
Source: World Bank

Expenses related to consumption of fuel to supply all the operating vessels and other oil-based lubricants required for the operation of the vessels.

As mentioned in *Strategy – ESG*, ZIM's commitment regarding the environment and legislation will translate in higher fuel expenses during the next years, due to the transition to fuel with low sulphur content (which is more expensive than the bunker fuel currently used) as well as the use of natural gas vessels. ZIM should take advantage of the high profits between 2020 and FY22 to finance these transitions. Even though fuel is a key cost, this constantly higher expense throughout the years will not mean that ZIM will be outperformed by its peers, since we believe that all companies within this industry will eventually make this transition to comply with governmental regulations. We accounted the fuel price variations in our estimates[4] . See graph 7 for fuel price forecast. For the remaining years of forecasting, we assume that these expenses will account for 13.82% of total revenue, resulting from the constant fuel price growth rate.

Other operating expenses

Figure 8 – Fuel Expenses Forecast



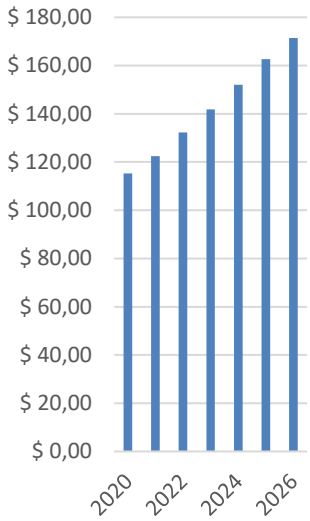
Source: Own estimates

These expenses represent the sum of several: port and canal expenses (5.18% of total revenue in 2020) consists of charges for a variety of services, including berthing, tug services and utilities, as well as canal dues ZIM pays to the operators of the Panama and Suez Canals; costs of related services and sundry (2.52%) – comprises mainly the expenses of subsidiaries that provide shipping-agent, logistics, forwarding and customs clearance services. There are also costs related to fleet equipment, insurance, maintenance and repair of vessels, wages and expenses relating to seagoing personnel, as well as agents' salaries and commissions. It is worth mentioning that these latter expenses are not relevant for the company as they account for less than 1% of total revenue individually. Following the same line of thought, Other operating expenses will retain the average % of total revenue in the 2018-2020 period: 15.65%, throughout the forecast. Regarding competitors, the outstanding size Maersk and MSC have (the two biggest companies), for example, allows them to construct and operate under their own ports, reducing some of these costs. Nevertheless, the peers who we point out to be closer to ZIM (Matson, Yang Ming, Wan Hai and Evergreen) also incur into these expenses and do not outperform ZIM.

Salaries

[4] Our method consists of multiplying the $t-1$ % of total revenue with t % of fuel price growth until 2025. For example, the 2021 fuel and lubricants expense is computed using the 2020's % of total revenue (9.06%) multiplied by 2021's fuel price growth (1 + 35.72%).

Figure 9 - Salaries Forecast



Source: Own estimates

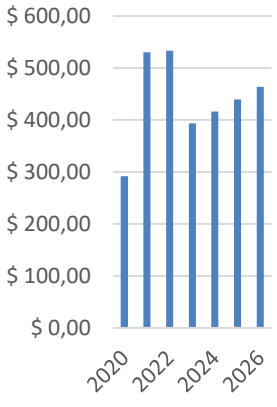
This segment relates the compensation of the administrative personnel. There are three key elements that impact the expense: number of employees, salary per employee, and TEUs carried per employee. We anticipate the number of employees to vary according to the expected TEUs carried. Since ZIM is an established company (operating since 1945), we believe that efficiency regarding the number of employees and TEUs carried is also set, resulting from years of experience, and learning curves. In addition, ZIM carried a respectable Total Capacity to Workforce ratio when comparing to its peers in 2020 – 108 TEUs per employee. The closest company in terms of capacity – Wan Hai, records 83 TEUs for the same ratio; and Matson a poor number of only 15 TEUs. Also, Yang Ming, although superior in capacity, outperforms ZIM in the same ratio slightly with 113 TEUs. On the other hand, Evergreen stakes a 140 TEUs per employee, but its size is considerably greater than ZIM's. Being said, the productivity of ZIM is above the mean of the mentioned list, and it shall reflect into lower relative costs in salaries, on average, when comparing to its peers.

Regarding TEUs carried per employee, we realize that this ratio fluctuated around 0.77, and for forecasting matters, it is safe to assume that efficiency will stay the same due to ZIM's 75 years of accumulated experience. Also, salary per employee follows the same observation in the ratio above, thus we believe that a reasonable forecasted salary per employee will contain the average salary per employee between adjusted to inflation (due to ZIM's commitment towards its employees). See Figure 9 for Salaries forecast.

Other G&A expenses

The rest of General & Administrative expenses represented an average of 1.33% of total revenue along the 2018-2020 period and due to its lack of significance will keep this percentage for the forecast. Includes depreciation and amortization related to computers and communication equipment and software, fees paid to consultants and advisers, and travel and vehicle expenses.

Figure 10 - Depreciation Forecast



Source: Own estimates

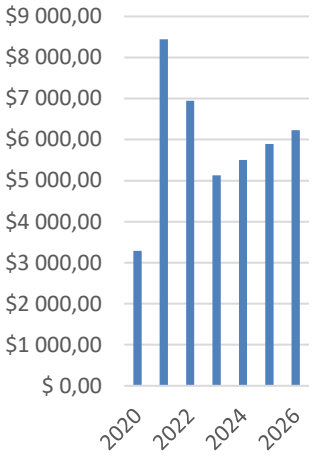
Depreciation

Consists of depreciation of operating assets, primarily vessels, containers, and chassis. To perform a forecast, we will assume that this expense will follow the average % of PPE between 2019 and 2020, which is 18.81%. The year 2018 was discarded since in 2019 ZIM adopted the IFRS16, resulting in higher values of depreciation, thus the significant increase in 2019 relates to accounting matters. Even though ZIM charters-in most of the fleet, the accounting standards coerce the company to record depreciation and amortization as an expense just as owning the fleet would require. Hence, we do not predict any significant relative changes when comparing these costs with competitors, since what matters in this caption is the number of vessels, which varies positively across companies.

Costs Overview

Total costs, as expected, since the main ones are correlated with the freight rates, are going to follow the same tendency as revenues, stabilizing towards the nominal long-term growth rate around FY2026. It is important to point that the operational costs, from FY2026 onwards, will be 82.14% of revenues, lower than the historical margins of approximately 89%. This is mainly a consequence of ZIM's efforts regarding efficiency, where the asset-light model has an important role.

Figure 11 – Total Costs Forecast



Source: Own estimates

The Israel based company has a clear difference when comparing to its peers, as the asset-light business model comes into part – varying the number of vessels will make depreciation expenses flexible, but the company faces more exposure to chartering rates. This model performs well during normal conditions, however, during times of high freight rate growth, like we are experiencing nowadays, this strategy may turn dangerous as costs rise. Here, owning the fleet will be beneficial because companies do not have to pay for higher charter rates, but in case of demand shocks, they do not have the adaptability ZIM has, and therefore will be paying for vessels with unused capacity.

Nevertheless, ZIM has been recently purchasing vessels in order to decrease its exposure, as well as to cope with the State of Israel imposition. About chartering itself, the networking synergies that ZIM has and is taking advantage of will provide ZIM the protection of charter rate increases.

Core Invested Capital Forecast

- Vessels

Investment in Vessels is key in container shipping, thus it is expected that it will represent a large portion of the Invested Capital - around 55% in 2020.

Here we have identified a clear difference between ZIM and its peers: the average cost per vessel of ZIM is expected to be higher than companies with owned fleet, not only for the volatility of charter rates and lease period agreements, but also for the fact that ships, although costly to own, have a corresponding high lifespan (around 40 years) and thus this expense can be deferred throughout the period. Nevertheless, the depreciation per vessel also accounts for polarities between ZIM and competitors, bringing a positive aspect to the table, since having an adaptable number of vessels also grants the flexibility in depreciation expenses, which is unlikely to happen if the fleet is owned. Therefore, we expect higher average costs per vessel for ZIM in 2022 when comparing to peers, before the industry returns to normality. The urge in global demand and the lack of capacity made container shipping companies acquire more vessels, which will be delivered in the two years. Here is where ZIM will outperform its peers, since returning to normality results in a beneficial environment for the Israel based company to undertake its leasing model, and competitors with more capacity may face overcapacity problems, meaning that they will be

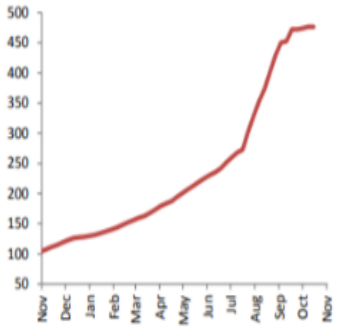
depreciating an asset that is not being efficiently used. In Figure 12, we can observe the forecasted fleet composition[5].

Figure 12 – Forecasted Vessel Chartering details

	2020	2021	2022	2023	2024	2025
Vessels already charted before 30/12/2020	87	87	39	39	39	39
Total Vessels needed		91	95	99	103	108
New vessels ordered		**4**	**55**	**37**	**26**	**11**
1 year		3	33	22	16	7
5 years		1	22	15	20	4
Cost per Vessel order in year X (in millions$)	$13,84	$44,98	$31,49	$18,89	$19,38	$19,87
% growth		225%	-30%	-40%	2,60%	2,50%
Average Cost of Vessel (in millions$)	**$13,84**	**$15,16**	**$24,38**	**$19,96**	**$20,05**	**$20,07**

Source: Annual Report and own estimates

Figure 13 – Charter Rates 2020 - 2021

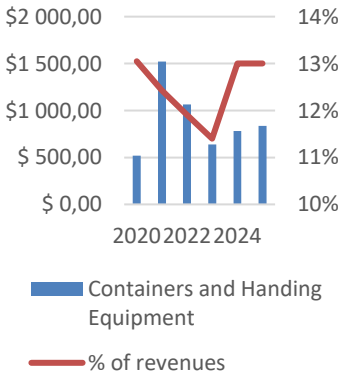


Source: Kontiki Shipbrokers

In 2020, there were 87 vessels, 48 of which were chartered for a period up to 1 year, 38 had chartering periods between 1 and 5 years and 1 that is own by the company. Starting in FY2021, the difference between the vessels already chartered and the vessels needed for that year gives us information about how many new vessels should ZIM charter, with respect to the 60/40 ratio. Regarding the charter costs per vessel order, for FY2021, we used the data provided by Kontiki Shipbrokers (from where we drove a 225% average annual growth rate that led to an average charter cost per vessel of $44.48 million in that year). The charter rate forecast for the remaining years, although difficult to estimate, followed the same approach as the freight rates forecast, since both rates follow the same mechanics.

As we can observe in our forecast, the fleet will tend to expand during the years to satisfy the increasing demand as expected. In addition, charter rates also tend to increase, which directly affects the average cost per vessel, from where we can point that (we will go back to this argument in *ZIM Risks*), in theory, owning a part of the fleet could decrease future vessel costs for ZIM, in contrast to chartering their entire fleet.

Figure 14 – Containers and Handling equipment Forecast



Source: Own estimates

- Containers and Handling equipment

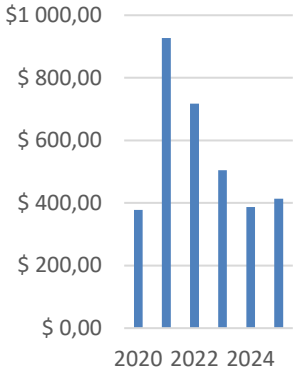
This financial record represented approximately 30% of the Core Business Invested Capital in the 2018-2020 period, making it the second largest asset class.

By observing both the TEUs carried and cost per TEU between 2019 and 2020, we notice that while ZIM freighted essentially the same TEUs (less than 1% change), the cost per TEU rose around 16%. Thus, we believe that Containers and Handling equipment are more influenced by freight rates rather than capacity since revenues are heavily affected by freight rates.

[5] The number of vessels needed for each year regarding the forecasted TEUs carried is: $\frac{TEUs\ carried\ in\ year\ X}{Average\ Annual\ Cargo\ per\ Vessel}$.

Consequently, it its coherent to assume that this account will keep the freight rate growth pace until FY2024, and from then onwards, 13% of revenues. This way permits us to incorporate the volatility of the rates as the main driver of this record. Due to its deep connection with freight rates, we reckon that the differences between ZIM and its peers are related with capacity instead of cost management.

Figure 15 – Working Capital Forecast

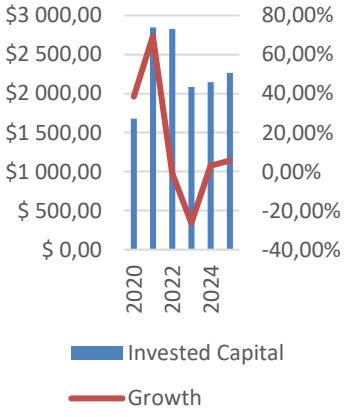


Source: Own estimates

- Working Capital

Analysing ZIM's working capital position allows us to better understand the liquidity, operational efficiency, and short-term financial health of the company in the future years. Let us start with Operating cash, which we assume it will be 5% of total revenue for all forecasting years. This high percentage is due to the fact that container shipping companies should have enough cash to pay expenses related with ports, forwarding, fees, and other costs that cannot be postponed, as well as account for the seasonality of the industry itself. Next, it takes ZIM around 39 days to collect its receivables and 56 days to settle payments. Note that in 2020, this Cash Conversion Cycle has deteriorated, due to the pandemic, and it is expected to remain this way until the end of 2023. Nevertheless, this metric still records a positive number, which positively affects ZIM's cash flow management. After this year, ZIM's Cash Conversion Cycle returns to healthier levels, which means that the company is able to postpone its payables in relation with its receivables. Regarding its peers, if we consider the pre-pandemic period, ZIM was only outperformed by Wan Hai in terms of CCC (-12 days against -21 days) and there is no sign that this trend will change in the future, if we take into account ZIM's effort regarding efficiency and established partnerships, previously mentioned.

Figure 16 – Total Invested Capital Forecast



Source: Own estimates

Non-Core Business Forecast

In regard to the Non-Core Business, specifically the Non-Core result, we will assume that it will follow an average of the 2018-2020 period, which was around $21 million times the inflation factor. Besides, non-core adjustments will be null in the future and total OCI will stay as an average of the period mentioned above. The invested capital in the non-core business is mainly allocated to Other Investments, Investments in associates and employee benefits. The first two are forecasted assuming the last three years' average and a link to inflation. In contrast, the latter will be valued as 61% of Salaries – also the 2018-2020 average. Furthermore, the Assets classified as held for sale, although it had high values in 2018 and 2019, in the following year there were vessels sold, leaving the account to 0, and for simplicity we will assume that will remain null through the forecast.

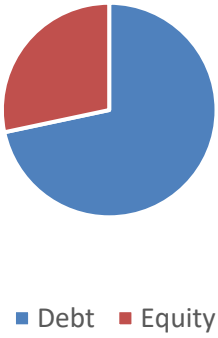
Financing Activities and Capital Structure Forecast

Net Financing and Equity

This metric is achieved by adding Debt and Minority interests, net of Excess cash. Further, Minority interests, due to its lack of significance, will resemble an average of the 2018-2020 period – $6,29 million, for forecasting affairs.

Then, we will assume that starting 2021 the company has a target D/E ratio of 2.53, because we will import to our model the deleveraging strategy that ZIM is keen on following. This value comes from the average of D/E ratios in 2020 of the following four container shipping companies: Matson (USA, 2.02), Yang Ming (Taiwan, 4.37), Wan Hai (Taiwan, 1.46) and Evergreen (Taiwan, 2.29). A 2,53 D/E ratio implies that Debt is about 72% of the Total Invested Capital and Equity the remaining 28%. Moreover, the chosen ratio represents the need of Debt for the high capital expenditure requirements these companies face, without compromising the shareholders' value and dividends. Finally, excess cash will amount to $125 million adjusted to inflation every year, due to ZIM's liquidity obligations related with its creditors. Future debt will, therefore, be forecasted as a result of these three assumptions (target capital structure ratio, excess cash amount and transactions with shareholders.

Figure 17 – Target Capital Structure – 2022 onwards

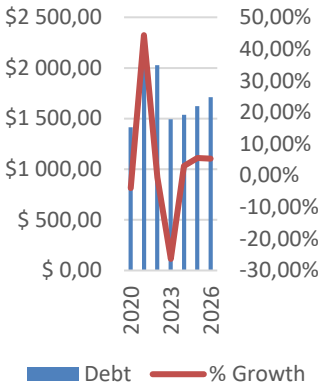


Source: Own estimates

Financing Result

We may arrive at this result by adding the company's financial expenses with the respective statutory taxes. These expenses come from the previous year's Debt value, thus we computed the % of debt of previous year for 2019 and 2020. Both numbers are similar, therefore we will define an average of the percentages (11.87%) as proxy for calculating future financial expenses. Furthermore, the statutory taxes serve as offset to decrease these costs, and account for 23% (Israeli tax rate) of the total expense amount.

Figure 18 – Net Financing Forecast



Source: Own estimates

Valuation Outcome

Weighted Average Cost of Capital

The WACC is the minimum return rate that the company is expected to pay, on average, to all its security holders, in order to finance itself. An accurate estimation of it is therefore crucial for our valuation model since all company future cash flows (including the terminal value) will be discounted according to it. The WACC considers the relative weights of each component of the capital structure (equity and debt). From our perspective, ZIM has a WACC of 7.84%, decomposed as follows.

Figure 19 – WACC Estimation

ZIM	
Risk-free rate	1,45%
Market Risk Premium	6,75%
Statutory Tax Rate	23,00%
Return on Debt	8,61%
β Debt	1,06
β Equity	1,40
Return on Equity	10,90%
WACC	**7,84%**

Source: Own estimates, Bloomberg, and KPMG forecast

- Cost of Equity

We used the Capital Asset Pricing Model to calculate ZIM's cost of equity. Normally, we would estimate the company Beta based on a regression between ZIM's historical closing stock prices and a market representative index (SP 500 in this case) using the US 10Y treasury bonds as risk-free rate. Since ZIM only went public in January 2021, it was not accurate to base our estimation in such small sample, so we developed our own estimation of ZIM's Beta.

Figure 20 – Equity Beta Estimation

Matson	
β levered	0,96
Yang Ming	
β levered	1,4
Wan Hai	
β levered	1,18
Evergreen	
β levered	1,34
ZIM	
β levered (average peers)	1,29
β levered (regression)	1,98
β levered (our view)	**1,4**

Source: Own estimates and Bloomberg

Firstly, we selected four close competitors of the company with more reliant stock samples: Matson (USA), Wan Hai (Taiwan), Yang Ming (Taiwan) and Evergreen (Taiwan). We applied the CAPM to each one, using the SP500 index in the Matson case, and the TWSE index with the remaining three companies that are listed in the Taiwan Stock Exchange. Then, we averaged the unlevered Betas and incorporated them with ZIM's capital structure, resulting in a 1.29 average Beta. We also applied the CAPM to ZIM's small sample (less than 1 year) against the SP500 index, which resulted in a 1,98 Beta with, as expected, a high standard error of roughly 1.17. Finally, after analysing our results, we believe that a Beta of approximately 1.4 represents our view of the company and its industry, since the container shipping industry is cyclical – more volatile than the benchmark, because when the market is performing badly, the clients of ZIM (and its peers) are spending less. Therefore, we arrive at a cost of equity of 10.90%. Regarding competitors, Matson has the lowest Cost of Equity of the list, and the Taiwan based companies all share the same 18%-19% values.

- Cost of Debt

We can arrive to the cost of debt by analysing the table below – which exposes the total Debt[6] ZIM has in detail.

Figure 21 – Debt Overview

Type of debt	Original currency	Fixed / Variable	Effective interest	Year of maturity	Face value	Carrying amount	Weighted Cost of Debt
Series 1 notes	U.S. dollars	Fixed	7%	2023	$302,20	$297,80	1,14%
Series 2 notes	U.S. dollars	Fixed	7,90%	2023	$130,40	$125,90	0,54%
Tranche E loan	U.S. dollars	Fixed	8,70%	2026	$73,40	$52,20	0,25%
Other	U.S. dollars	Fixed	9,40%	2021 - 2025	$56,20	$56,20	0,29%
Long-term liabilities	U.S. dollars		-	2021 - 2022	$3,40	$3,40	0,00%
Short-term credit from	U.S. dollars	Fixed	2,70%	2021	$122,50	$122,50	0,18%
Total					$688,10	$658,00	
Lease liabilities	Mainly U.S. dollars	Fixed	10,80%	2021 - 2036	$1 174,00	$1 174,00	6,92%
Total					**$1 862,10**	**$1 832,00**	**9,32%**

Source: Annual Report and Own estimates

[6] Cost of Debt: $Total\ Weighted\ Cost\ of\ Debt - Loss\ Given\ Default * Default\ Probability$.

Each tranche of debt has an Effective interest – the cost of that specific tranche; and carrying amount associated – the value of outstanding debt related to the tranche. Therefore, the payout for creditors excluding default probability is 9.32%. Further, ZIM has a High Yield 2 default risk, and its probability of default is 1.05%[7]. By having a greater than 0 probability of default, the Cost of Debt decreases, as we will check, since the expected value of the return of debt also shrinks, resulting from the possible miss of payments to creditors. When companies enter debt, it is usual that they are subject to some covenants – measures creditors impose to better protect their investment. In the case of ZIM, there is only one relevant covenant, which is the enforcement of having a minimum monthly liquidity of $125 million (in 2020, ZIM had $570 million in Cash & Equivalents). As mentioned above, the amount of outstanding debt ZIM faces reaches $1 832 million, yet we assume that the loss given default will be the difference between this amount and the Cash & Equivalents financial record, adjusted to percentage using the Total Face Value of Debt[8], which is 68%. After all, the Cost of Debt is 8.61%. When comparing to peers, ZIM has a remarkably higher debt cost (Matson and the Taiwanese companies share similar value around 1,5%). Due to the deleveraging vision ZIM has, it is expected that this cost will reduce in exchange for a higher Cost of Equity, converging to industry average.

Discounted Cash Flow

The DCF model accounts the sum of all Free Cash Flow until the steady-state year (2028, including) convoyed to the present using the WACC rate (7.84%). Let us perform the walkthrough of the model (see Figure 22).

Figure 22 – Free Cash Flows Forecast

in millions $	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Core Business											
Core Business	$3,23	$85,78	$540,39	$3 163,68	$1 753,41	$528,83	$567,94	$365,57	$373,07	$393,10	$414,20
Change Core Invested Capital		$195,20	$474,13	$1 175,68	-$12,72	-$739,37	$68,80	$125,55	$126,11	$132,89	$140,02
Core Free Cash Flow	$3,23	-$109,42	$66,26	$1 988,01	$1 766,14	$1 268,20	$499,14	$240,03	$246,95	$260,21	$274,18
Non-Core Business											
Non-Core Business	-$51,66	$11,27	$134,32	$12,90	$13,50	$13,98	$14,45	$14,92	$15,36	$15,81	$16,28
Change Non-Core Invested Capital		-$39,41	-$7,05	-$10,26	-$5,53	-$5,45	-$5,78	-$6,13	-$4,96	-$5,24	-$5,53
Non-Core Free Cash Flow	-$51,66	$50,68	$141,37	$23,16	$19,03	$19,42	$20,24	$21,05	$20,33	$21,06	$21,81
Financial											
Financial Result	-$78,32	-$120,70	-$145,81	-$167,41	$0,00	-$184,54	-$135,78	-$139,91	-$147,72	-$155,66	-$164,02
Change in Debt		$183,17	-$57,86	-$1 605,76	$2 219,34	-$533,82	$45,16	$85,58	$86,83	$91,49	$96,39
Change in Equity		-$27,37	$524,93	$2 771,17	-$2 237,59	-$211,00	$17,85	$33,83	$34,32	$36,16	$38,10
Comprehensive income	-$126,75	-$23,65	$528,90	$3 009,17	$1 766,91	$358,27	$446,61	$240,59	$240,71	$253,25	$266,46
Financing Cash Flow	$48,43	$58,74	-$207,63	-$2 011,17	-$1 785,16	-$1 287,63	-$519,38	-$261,08	-$267,28	-$281,26	-$295,99
Free Cash Flow	**-$48,43**	**-$58,74**	**$207,63**	**$2 011,17**	**$1 785,16**	**$1 287,63**	**$519,38**	**$261,08**	**$267,28**	**$281,26**	**$295,99**

Source: Own estimates

Here, the Free Cash Flow is the sum of Core and Non-Core Free Cash Flow. We know that the Core and Non-Core Business Result brings cash to the company, nevertheless we still must

[7] Source: Bloomberg

[8] $\frac{Total\ Carying\ Amount - Cash\ \&\ Equivalents}{Total\ Face\ Value\ of\ Debt}$

account for the balance sheet records' variation each year, which represent both investments and expenses related to ZIM's operations, previously discussed. Therefore, the FCF for Core/Non-Core Business formula is: $FCF = Core\ (Non\ Core)\ Business\ Result - Change\ in\ Core\ (Non\ Core)\ Invested\ Capital$.

Moreover, a steady-state scenario exists when the following conditions are met:

- A stable sales' growth rate from year to year, and this same growth rate must be aligned with the nominal long term growth rate of the economy
- The return on the invested capital needs to be stable from year to year as well.

Figure 23 – Steady-State

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Sales' Growth Rate	1,6%	21,0%	206,6%	-26,9%	-37,3%	7,1%	7,0%	5,4%	5,4%	5,4%
Core Business Growth Rate	-2552,4%	530,0%	485,4%	-44,6%	-69,8%	7,4%	-35,6%	2,0%	5,4%	5,4%
Core RONIC		232,9%	553,3%	-120,0%	9625,7%	-5,3%	-294,1%	6,0%	15,9%	15,9%
Core ROIC	8,1%	43,1%	183,0%	60,4%	18,3%	26,4%	16,5%	15,9%	15,9%	15,9%
										Steady state

Source: Own estimates

By checking figure 35, we notice that it is in 2028 that these requirements congregate. The sales growth rate (5.4%) is equal to the nominal long term growth rate of the economy, as expected inflation for 2028 is 2.30% and Global GDP growth rate is 3%. Further, the 15.9% steady-state Core Return on Invested Capital represents a reasonable rate that includes, in our view, the value of the strategy ZIM obeys.

Figure 24 – Valuation Metrics

Terminal Value	$7 350,26
PV Terminal Value	$4 019,06
Core DCF	$5 367,58
Non Core Book Value (2020)	$134,32
Entreprise Value	$9 520,96
Equity	$8 108,38
Net Debt Book Value	$1 412,58

Source: Own estimates

Now, to get the Core DCF, we applied the NPV formula with the inputs above mentioned, returning $5 367 million. Note that the Non-Core Business will be regarded as the 2020 book value - $132 million (see Figure 24).

The next step is to calculate the Terminal Value and then compute its present value, arriving at a PV Terminal Value of $4 019 million. Now, it is possible to calculate the Enterprise Value of ZIM arriving at $9 520 million. By netting this value with the Net Debt Book Value of 2020 ($1 412 million), we secure an Equity value of $8 108 million. Aligned with the 115 million shares outstanding, our estimated fair value of the share price is **$70,51**.

Sensitivity Analysis

Figure 25 – Re Sensitive Analysis

βe	1,299	1,400	1,600	1,985
Re	10,22%	10,90%	12,25%	14,85%
WACC	7,64%	7,84%	8,22%	8,96%

Source: Own estimates

In order to analyse how the WACC reacts when variables change, we firstly computed a sensitivity analysis in regard to βe, hence Re.

Bringing back the chapter *Cost of Equity*, we assume that the β of ZIM may be dispersed across the mentioned peers average β of 1.29 and the ZIM solo regression β of 1.98 – see Figure 25. We realize that the WACC fluctuates heavily with respect to different Re, from 7.96% to 8.96%.

Figure 26 – Rd Sensitive

Default probabilty	0,88	1,05	1,22	1,5
Rd	8,72%	8,61%	8,49%	8,30%
WACC	7,90%	7,84%	7,77%	7,67%

Source: Own estimates

Then, we approached the Cost of Debt using the default risk that ZIM integrates – High Yield 2 (HY2), whose default probability varies between 0.88% and 1.5%. Let us use this interval has mean to impact Rd – see Figure 26. In contrast to Re, the Rd varies slightly, which results in a lower deviation of the WACC (ranging from 7.67% to 7.90%).

Figure 27 – WACC Sensitive

		Re			
		10,22%	10,90%	12,25%	14,85%
Rd	8,72%	7,71%	7,90%	8,28%	9,02%
	8,61%	7,65%	7,84%	8,22%	8,96%
	8,49%	7,58%	7,77%	8,16%	8,89%
	8,30%	7,48%	7,67%	8,05%	8,79%

Source: Own estimates

Next, we created a matrix – Figure 27, where we combined each Rd and Re (calculated before) obtaining their respective WACC. The range of WACC values varies from 7.48% to 9.02%, according to its sensibility towards the cost of equity and debt. After, we tested the sensibility of the share price relative to WACC. We chose five different WACC values, from the lowest to the highest one obtained in the matrix, and the median being our original model's WACC. Using the security's closing price of the 13th of December 2021 ($49.47), we conclude that even if ZIM has a higher cost of capital, an investment in this company still resembles a viable opportunity.

Figure 28 – WACC-Share price Sensitive Analysis

	WACC				
	7,48%	7,66%	7,84%	8,43%	9,02%
Share Price	$78,05	$73,97	$70,51	$61,92	$55,98

Source: Own estimates

Moreover, we analysed how different growth rates might affect the share price's fair value. Our reasoning to change the growth rate is related to the global GDP growth rate, which we arbitrarily chose 2% and 4%, reflecting two different visions on the overall performance of the world economy in the steady state. These, aligned with inflation, return the different nominal long-term growth rates. After, we created a matrix – Figure 29, where we tested the share price sensibility regarding the previous WACC values and these three growth rates. Again, bringing the reference price of $49.48, even on low economy growth we believe that ZIM's stock is also undervalued.

Figure 29 – WACC-Growth rate Sensitive Analysis

		WACC				
		7,48%	7,66%	7,84%	8,43%	9,02%
g	4,35%	$67,01	$64,73	$62,70	$57,13	$52,89
	5,37%	$77,93	$73,92	$70,51	$61,91	$55,97
	6,39%	$109,36	$97,92	$89,36	$71,48	$61,46

Source: Own estimates