



**MASTERS IN  
FINANCE**

**MASTERS FINAL WORK  
PROJECT**

EQUITY RESEARCH:  
HAPAG-LLOYD, AG

JIAYU WANG

DECEMBER 2022



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**SUPERVISOR:**

**PEDRO RINO VIEIRA**

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# Abstract

The Equity Research report of Hapag-Lloyd, AG was written based on the research report format of ISEG's Master Final Work also recommended by the CFA Institute, divided into the following 8 parts: Research Snapshot, Business Description, Management and Corporate Governance which also includes Environmental, Social and Governance, Industry Analysis, Investment Summary, Valuation, Financial Analysis, Investment Risks.

Hapag-Lloyd is the 5<sup>th</sup> largest container liner shipping company that operates worldwide with 421 sales offices in 137 countries. The core business of Hapag-Lloyd is container liner shipping, but also includes transport services from door to door. Its leading market position is evidenced by its transport capacity of 1.8m TEU and revenue of €22.3bn in FY2021, a sharp increase of 74% compared to FY2020.

With the closing price at €177.6 per share on 30<sup>th</sup> December 2022 and a calculated price target of €207.84 for 2023YE, Hapag-Lloyd's recommendation is "Hold" given its high exposure to economic cycles and the high-risk profile indicated by its "single" business segment. The price target is estimated based on the DCF model as the primary methodology, supported by other absolute and relative methods, representing an upside potential of 17.03%.

Hapag-Lloyd expects to deliver solid financial performance in 2022, because of ultra-high freight rates resulting from supply chain disruptions and high demand for goods.

JEL classification: G10 ; G32; G34; G35.

Keywords: Hapag-Lloyd; Container Linear Shipping Industry; Freight Rate; Maritime Shipping; Equity Research; Valuation; Mergers & Acquisitions; Discounted Cash Flow; Free Cash Flow to Firm; Free Cash Flow to Equity

## Resumo

O relatório de *Equity Research* da *Hapag-Lloyd, AG* foi escrito com base no formato de relatório de pesquisa do Trabalho Final de Mestrado do ISEG, recomendado pelo *CFA Institute*, tendo sido dividido nas seguintes 8 partes: *Research Snapshot, Business Description, Management and Corporate Governance* que também inclui o *Environmental, Social and Governance*, a *Industry Analysis*, o *Investment Summary*, a *Valuation*, a *Financial Analysis*, bem como *Investment Risks*.

A Hapag-Lloyd é a quinta maior empresa de transporte marítimo de contentores a nível mundial, com 421 escritórios distribuídos por 137 países. A principal linha de negócio da Hapag-Lloyd é o transporte marítimo de contentores, porém a mesma também presta serviços transporte da porta à porta. Sua posição de líder de mercado é apoiada pela sua capacidade de transporte de 1,8 milhões de toneladas e volume de negócios de €22,3 bilhões em 2021, um incremento significativo de 74% por comparação a 2020.

Com o *closing price* de €177,6 por ação a 30 de dezembro de 2022 e um *price target* estimado de €207,84 para o final de 2023, a recomendação para a *Hapag-Lloyd* é "*Hold*", tendo em conta a sua elevada exposição a ciclos económicos e o elevado perfil de risco do seu modelo de negócio, caracterizado por um segmento único. O *price target* foi determinado com base no modelo DCF como metodologia principal, apoiado por outros métodos absolutos e relativos, representando deste modo um potencial de valorização de 17,03%.

A empresa espera demonstrar uma performance financeira sólida em 2022, devido às tarifas de frete extremamente elevadas, resultantes de interrupções na cadeia de abastecimento e elevada procura agregada de bens.

Classificação JEL: G10 ; G32; G34; G35.

Palavras-Chave: Container Linear Shipping Industry; Freight Rate; Maritime Shipping; Equity Research; Valuation; Mergers & Acquisitions; Discounted Cash Flow; Free Cash Flow to Firm; Free Cash Flow to Equity

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# Abbreviation

## A

AI	Artificial Intelligence
APV	Adjusted Present Value

## B

bn	Billions
bp	Basis Point
B2C	Business-to-Consumer
BICS	Bloomberg Industry Classification System

## C

C2C	Consumer-to-Consumer
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CAPM	Capital Asset Pricing Model
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CO2	Carbon Dioxide
COSCO	China Ocean Shipping (Group) Company
CP ships	Canadian shipping Company
CSAV	Chilean Compania Sud Americana de Vapores

## D

DCF	Discounted Cash Flow
DDM	Dividend Discount Model
DWT	Deadweight ton
D&A	Depreciation and Amortization

## E

EBITDA	Earnings Before Interest, Taxes, Depreciation & Amortization
ERP	Equity Risk Premium
ESG	Environmental Social and Governance
EV	Enterprise Value

## F

F	Forecasted (as in "2022F")
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to Firm
FFE	Flow to Equity
FTE	Forty-Food Container Equivalent Unit
FY	Fiscal Year

## G

g	Growth rate
GCGC	German Corporate Governance Code
GDP	Gross Domestic Product
GGM	Gordon Growth Model

## I

IMF	International Monetary Fund
IMO	International Maritime Organization
IoT	Internet of Things

## M

m	Millions
mkt	Market
M&A	Mergers and Acquisitions
MSC	Mediterranean Shipping Company

## N

NDL	Norddeutscher Lloyd
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## O

OECD	Organisation for Economic Co-operation and Development
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## P

P/E	Price/Earnings
PP&E	Property, Plant and Equipment
PwC	Pricewaterhouse Coopers
PT	Price Target

## R

RFR	Risk Free Rate
ROA	Return on Assets
ROE	Return on Equity
ROIC	Return on Invested Capital

## S

SWIFT	Society for Worldwide Interbank Financial Telecommunication
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## T

TEU	Twenty-Foot Container Equivalent Unit
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## U

UASC	United Arab Shipping Company
US	United States
UNCTAD	United Nations Conference on Trade and Development
ULCS	Ultra-Large Container Ships

## W

WACC	Weighted Average Cost of Capital
WTI	West Texas Intermediate

## Y

YE	Year End
YOY	Year on Year

## Other

1H	First Half
2H	Second Half

## Hapag-Lloyd: “Your Cargo – Our Passion”

(YE2023 PT of €340.06 (+28%); recommendation is to Hold with High Risk)

### 1. Research Snapshot

This research initiates a **HOLD recommendation** for Hapag-Lloyd AG (Hapag-Lloyd) with a **2023YE price target of €207.84/share**. The price target was calculated using a DCF model, reaching an **upside potential of 17.03%** or, in other words, a potential **annualized return of 17.03%** from the 30<sup>th</sup> December 2022 closing price of €177.6 (Figure 1), although with **high risk**.

In a challenging market environment, Hapag-Lloyd’s business has been growing significantly, with accelerating operating income growth, along with improving profitability margin, leading the market share increase. With a reasonable valuation, this stock would be a coveted stock for long-term investors. The main consideration of the valuation comes from the following three aspects:

#### Exceptional performance achieved in FY2021 with some uncertainties

Hapag-Lloyd managed to present the resilience and strength of its business in a market filled with uncertainties by achieving a record **EBITDA of €10.85bn** at YE2021, which represented an outstanding **EBITDA margin of 48.7%** based on **total sales of €22.27bn** (Figure 2). The rise in sales was mainly as a result of **exceptionally high freight rate** that was caused by the imbalance between supply and demand, which is expected to be gradually improved over 2022. However, Hapag-Lloyd also faced significant rise in transport expense due to severe bottlenecks in the global supply chain. Overall, the company reached an increase of **74% YOY in sales** with improved profitability proven by **net margin of 40.8%** which is expected to be back to near pre-pandemic level in 2024.

#### Sustainable return policy for shareholders

Hapag-Lloyd has paid a dividend for 5 straight years and has increased its dividend during last 3 years (in 2018, the dividends were €0.15 per share). Due to the strong increase in earning and the very good balance sheet ratios, the Executive Board proposed to **increase the dividend for 2021 to €35 per share, with respective payout ratio of 68%** (Figure 3), which was 10 times of the 2020 dividend paid on 26 May 2022.

#### Conservative outlook for container liner shipping industry in the long term

The medium-term growth in **shipping supply is presently expected to be restricted** due to a low shipbuilding orderbook, although operators have invested in ordering new capacity due to significant cash inflows in 2021. Fleet productivity is still being limited by onshore logistics and port bottlenecks, particularly in China as a result of the periodic lockdowns. **The shipping demand has been recovering since last year**. Dry-bunker demand is moderately growing on the back of lower Chinese iron ore imports, while product tankers went steadily back to pre-pandemic level. nevertheless, the market environment is still **considered to be challenging** with unsustainable imbalance in demand and supply, uncertainties in oil price due to Ukrainian - Russia War as well as the environment regulations.

Price Target	€ 207.84
Close Price on 130-Dec-22	€ 177.60
Upside Potential	17.03%
Annualized Return	17.03%

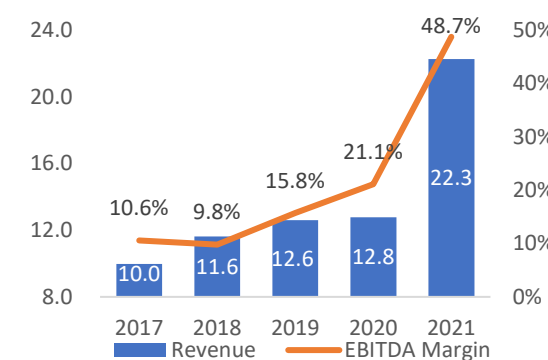
Bloomberg/Reuters Code:	HLAG GY
Equity/ HLAG.DE	
Market Capitalization/ Million	€ 31,214.98
N° of shares outstanding/ M	175.76
52- week range	167.6-€474.6
Volume	20240
Institutional Ownership	96.80%

Figure 1. Relative Price Performance



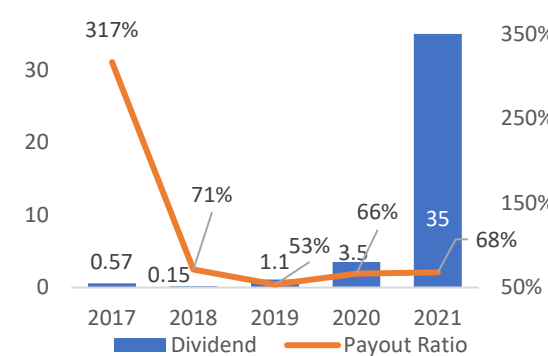
Source: Bloomberg, Author Estimates

Figure 2. Revenue and EBITDA margins



Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 3. Dividend and payout ratio



Source: Hapag-Lloyd Annual Report, Author Analysis

## 2. Business Description

### The Company

Hapag-Lloyd AG is a Germany-based company primarily engaged in the **marine freight and logistics sector**, with a **market capitalization of €46.7bn** (Figure 4). With 253 vessels (Figure 5), namely a capacity of 1.8m TEUs and container capacity of 3.0m TEUs, **Hapag-Lloyd is the 5<sup>th</sup> largest container liner shipping company** that operates worldwide through **421 sales offices in 137 countries**, with 14,100 employees.

The company mainly provides container liner shipping services and transport services from door to door. Its products and services include e-business solutions, security information services, special cargo services, reefer solutions, customs clearance, as well as US flag services, among others. The company offers its customers worldwide access to a network of 126 liner services (Appendix 1).

### History

**Hapag-Lloyd arose in 1970** from the merger of two shipping companies, the Hamburg-Amerikanische Packetfahrt-Actien Gesellschaft (Hapag) and Norddeutscher Lloyd (North German Lloyd, or NDL). Hapag was founded in 1874, with the initial business of bringing European immigrants to the US, which was a growing industry at the time. After completing the construction of its first express steamers at late 1880s, Hapag became a leader in the North Atlantic trade. DNL was established in 1856 with the goal of transporting passengers and goods from Germany to New York.

Hapag-Lloyd made several **M&A transactions that scaled the company into its market positions during its history** (Table 1). In 1998, the company was acquired by **Touristik Union International** and was sold in 2008. During this period, TUI bought 89.5% shares of the **Canadian shipping Company** (CP ships) in 2005, leading the company to become the 5<sup>th</sup> largest container shipping in the industry.

In 2014, the container business operations of the **Chilean Compania Sud Americana de Vapores (CSAV)** were being merged with Hapag-Lloyd as the two companies joined forces to become the 4<sup>th</sup> largest liner shipping company in the world.

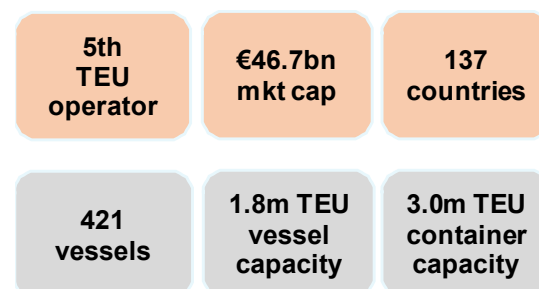
In 2017, the company successfully completed the integration of **United Arab Shipping Company (UASC)**, the largest container shipping line in the Middle East region and adjacent markets, covering 275 ports and destinations worldwide. For this transaction, Hapag-Lloyd conducted a **€352m capital increase** to strengthen the capital structure and to reduce the leverage.

In 2021, Hapag-Lloyd acquired 100% of the shares and voting rights of the Dutch container shipping company **Nile Dutch Investments B.V. (NileDutch)**, a significant supplier of container services in West Africa. With the acquisition, Hapag-Lloyd was able to strengthen its presence in the African market.

### Business Segment

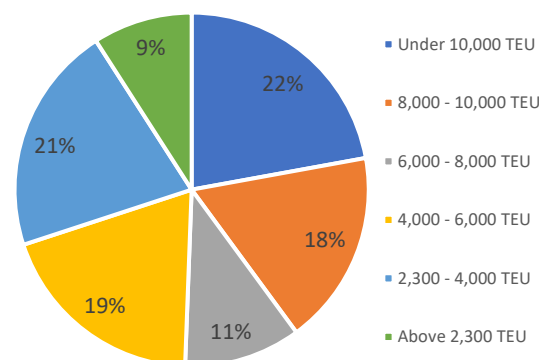
Hapag-Lloyd reports their business activities in **seven segments** which are divided geographically: Atlantic, Transpacific, Far East, Middle East, Intra-Asia, Latin America, Africa (Figure 6, Appendix 2). During 2021, the EMA trade (full name as Europe-Mediterranean-Africa trade), now is renamed to Africa trade with the completion of integration of Nile Dutch. In addition, the Inter-European business is integrated into the Atlantic trade.

Figure 4. Hapag-Lloyd 2021 key results



Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 5. Vessel Capacity Composition



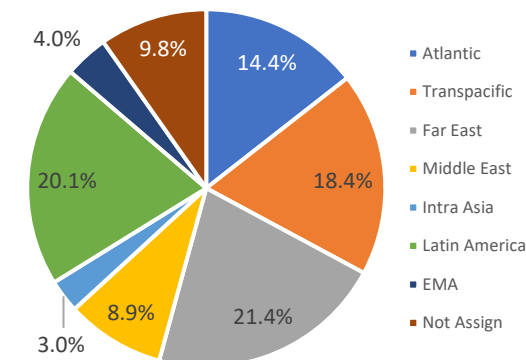
Source: Hapag-Lloyd Annual Report, Author Analysis

Table 1. Hapag-Lloyd M&A Transactions

Year	Company	Value	Payment
2005	CP ships	\$2.0bn	Cash
2014	CSAV	\$6.6m	N/D
2017	UASC	\$4.4bn	Stock
2021	NileDutch	€117m	Cash

Source: Bloomberg, Author Analysis

Figure 6. Revenue per segment



Source: Hapag-Lloyd Annual Report, Author Analysis

The income from demurrage and detention for containers, as well as compensation payments for shipping space, are the major components of the item for **revenue not assigned to trades**. Additionally, income for already-generated pending voyages is recognized under revenue not assigned to trades. This segment represents **9.7% of the total revenue** in 2021.

### Atlantic Trade

With a comprehensive solution integrating **7 powerful THE Alliance loops** including different services, The Atlantic Trade is a special market for the container liner shipping sector and **the stronghold of the company** (Appendix 3).

This segment has 2 operating sub-segments: North Europe to North America and Mediterranean to North America. It offers the **most extensive port coverage** (Appendix 4) in the transatlantic market with **speedy transit times, connecting every coast** of the US, Mexico, and Canada with North Europe and the Mediterranean region. The company also provides the customer a variety of intermodal connections proven by its 85 trains per week between the 10 biggest port-ramps and 2m truck loads each year among the 15 biggest door sites in the Atlantic Trade.

Atlantic Trade posted a **revenue of €3,215.5m**, representing **14.44% of the total revenue** with a **14.6% CAGR from 2017 to 2021** (Figure 7). The sharp increase is caused by the exceptionally high freight rate during 2021.

### Transpacific Trade

With all its exceptional services, Hapag-Lloyd is the top carrier in the Transpacific and India Subcontinent Trade, also known as North America - Middle East Trade.

This segment has 3 operating sectors: North America to Asia, North America to Middle East and Oceania to North America. By offering a **wide range of regular services** that operates among the coasts at as **quick transit times** as allowed, the company offers **outstanding port coverage** in the majority of counties in North America, Middle East, Oceania and Asia. Additionally, the business provides **comprehensive multimodal delivery services** to all significant Ramp and Door Sites.

Transpacific Trade reported a **revenue of €4,856m**, representing **18.42% of the total revenue** with a **23.0% CAGR from 2017 to 2021** (Figure 8), with the same reason mentioned before.

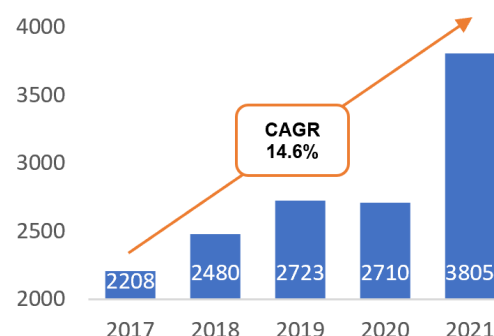
### Far East Trade

The company is a **local expert** with eight service loops and a chain of offices spread out across Asia and Europe.

The segment has 2 business lines: Far East to North Europe and Fast East to Mediterranean. The company has a **concentration upon lean products** with **apace transit times** between major markets in Asia and Europe, with an **environmentally friendly fleet**, a **sizable feeder network** which ensures that the company is able to meet all non-direct transportation demands. In addition, Hapag-Lloyd offers inland services with a wider selection of **door delivery options** and a **modern fleet of reefer containers** to accommodate customers that want **temperature control**.

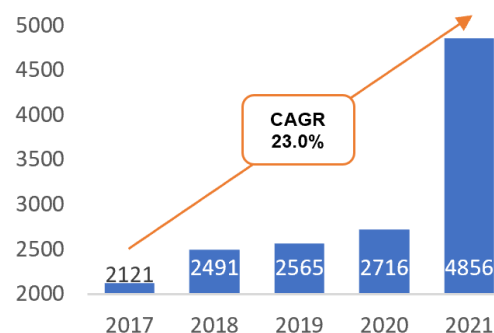
Europe - Asia Trade's **revenue accounted to €5,637m**, representing **21.39% of the total revenue** with a **41.1% CAGR from 2017 to 2021** (Figure 9).

Figure 7. Atlantic Trade Revenue



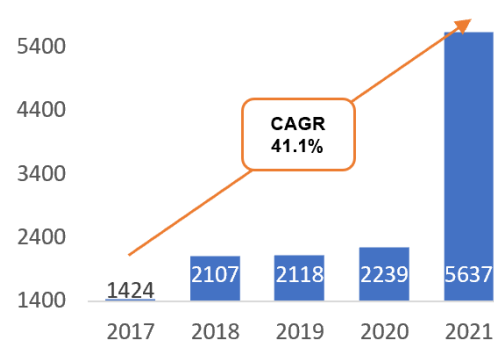
Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 8. Transpacific Trade



Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 9. Fast East Trade



Source: Hapag-Lloyd Annual Report, Author Analysis

## Middle East Trade

With the transition that took place in 2021, the corporation now offers a more comprehensive coverage with **services at more than 10 mainlines and 16 ports** throughout the Middle East, Europe, and India Subcontinent.

This segment also has 3 shipping lines: India Subcontinent to North Europe, Mediterranean to India Subcontinent, and intra Middle East which means the line inter India Subcontinent. The container shipping network in this region has been created to **offer the highest-quality full connection, providing optimal geographic footprint**. The company is able to connect most of the ports in the region through major transshipment hubs. The corporation also provides the sailings among **strategical vital ports**, by offering **possible services and routings**.

Middle East delivered a revenue of **€1,989.4m**, representing **8.31% of the total revenue** with a **27.4% CAGR** during 2017 to 2021 (Figure 10).

## Intra-Asia Trade

With three services in the Red Sea to the Far East, Hapag-Lloyd provides **market-leading experience** in the **secure transportation of temperature-sensitive goods**.

The business offers first-rate local client support for all types of cargo, including **dangerous items, special cargo, and reefer freight**. The client could cut their costs due to **greater supply chain integrity** provided by the company, which are demonstrated by the **customizable and reliable freight transportation, extensive network** bringing more options, and **improved storage and warehouse management** allowing for a smaller inventory buffer.

Inter-Asia delivered a revenue of **€666.1m**, representing only **2.99% of the total revenue**, which is the lowest segment of the company, but still with a **12.5% CAGR** during 2017 to 2021 (Figure 11).

## Latin America Trade

Hapag-Lloyd is **the major active player** in Latin America with market leadership in certain market segment shown by having **two business lines** in this region: Latin America to Asia and Latin America to Europe.

The company has services from Latin America and its connected **worldwide network** with consistently **excellent and competitive transit times** and a **reliable schedule**. In particular, Hapag-Lloyd offers **quality reefer service** for all varieties of **frozen cargo**, including **new and innovative reefer** even with a promise to keep making investments in this field. Besides that, the company has **an extensive range of specific equipment** available that is focused on break-bulk and out-of-gauge in this business line.

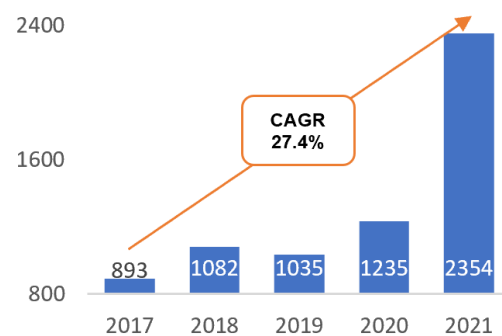
Latin America's revenue amounted to **€5,302.2m**, representing **20.12% of the total revenue** with a **18.7% CAGR** during 2017 to 2021 (Figure 12).

## Africa Trade

The firm considers Africa to be strategically essential and supplies an dense network and higher number of voyages to South Africa and West Africa following the acquisition of NileDutch. With direct services connecting all major ports, the company can demonstrate its worldwide connectivity in the region.

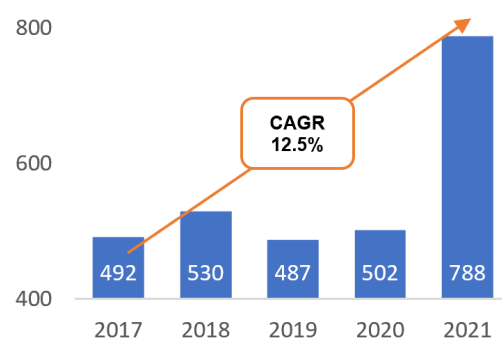
Africa Trade posted a revenue of **€1,042.2m**, representing only **3.95% of the total revenue** with a **15.7% CAGR** from 2017 to 2021 (Figure 13).

Figure 10. Middle East Trade



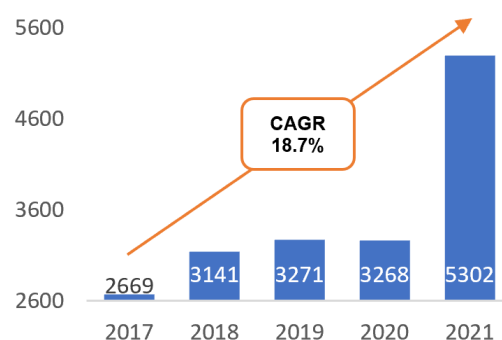
Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 11. Intra-Asia Trade



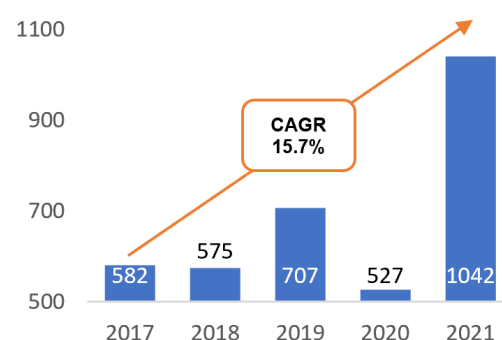
Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 12. Latin America Trade



Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 13. Africa Trade



Source: Hapag-Lloyd Annual Report, Author Analysis



## Strategy 2023

The container liner shipping sector went through a period of intense consolidation between 2014 and 2018, as a result of which the top 10 competitors currently control more than 80% of the worldwide market. Hapag-Lloyd has also been able to greatly **improve its cost competitiveness** through its mergers with CSAV and UASC and **enhance its market shares**. However, the Executive Board of Hapag-Lloyd anticipates that in the future, unit costs and economies of scale will not be the only factors affecting the container shipping sector. Instead, they strongly consider that clients are prepared to pay more for quality, service, and higher reliability, and that these will become the deciding competitive criteria. Based on these presumptions, Hapag-Lloyd created and announced its medium-term strategy in 2018, which were (Figure 14, Appendix 7):

- **Become number one for quality**
- **Remain a global player**
- **Profitability throughout the entire economic cycle**

A detailed analysis of the current strategy was carried out in FY 2021, in response to the market disruptions brought by the COVID-19 pandemic, as well as the fast-rising importance of sustainability challenges and growing digitalization. The fourth major objective would be **sustainability** and will be one of the most important points in the following years.

### Become number one for quality

The firm has created **10 quality pledges**, including quick booking responses, timely and accurate bills of landing, accurate invoicing, loaded as booked, and other quality promises (Appendix 5), to help it reach its objective of becoming the best in quality. Additionally, the business announced **5 additional quality commitments** in 2021, which served as the partnership's cornerstone. In order to provide customers the option to request pricing quotations, track shipments online, the company also continued to improve the online booking tool **Quick Quotes** and add new digital services. This is reflected in the growing demand: in 2021, **approximately 25%** of all bookings-or roughly 2.7m containers -were made via site channel.

### Remain a global player

Hapag-Lloyd intends to have a 10% share of the market globally (excluding intra-Asia). This percentage was roughly 9.4% as of 2021YE. The company **aims to maintain its market share by expanding along with the market**. Moreover, it hopes to grow in prospective emerging markets, particularly in the field of special cargo, which includes the shipping of reefer containers, where Hapag-Lloyd now holds a solid position in the market. Furthermore, the company keeps investing in the **growth of reefer containers capacity** as part of the goal. The firm has been able to develop its operations in another promising growth area due to the successful acquisition of its rival NileDutch in 2021, which specializes in operation in Africa.

### Profitability throughout the entire economic cycle

The company is seeking profitability throughout the entire economic cycle as part of their Strategy. This is demonstrated in an **appropriate ROIC equals the WACC** at the least. The Company's exceptional earnings position in 2021 enabled it to achieve all of its long-term financial targets (Figure 15).

### Sustainability

The main aspect of the new sustainability plan is the **reduction of greenhouse emissions**. Hapag-Lloyd is collaborating with global organization to make

Figure 14. Core objectives of Strategy 2023

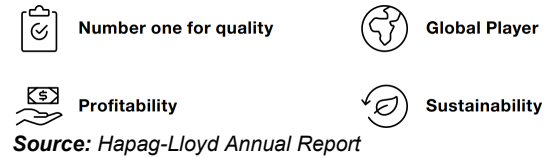
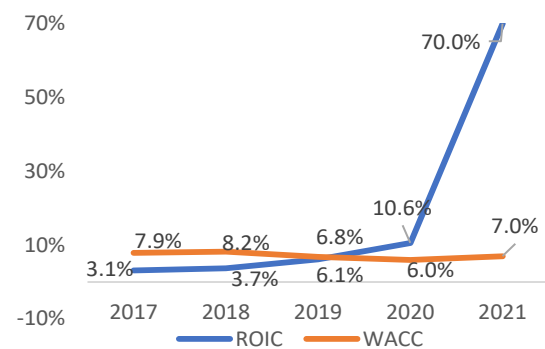


Figure 15. Profitability in last 5 years



shipping more ecologically friendly. Hapag-Lloyd cut CO2 emissions per TEU-km by over 50% between 2008 and 2019 with the goal of **achieving carbon neutrality by 2045**. In order to do this, it plans to improve operational efficiency, convert aging ships, replace inefficient ones with new ones, and switch to fuels with low or no carbon emissions. Twelve big container ships have been purchased for such purpose, and one huge vessel has been retrofitted. These ships can work on both fossil fuels and organic or synthetic gas, which will significantly reduce greenhouse gas emissions (Appendix 6).

## Shareholder Structure

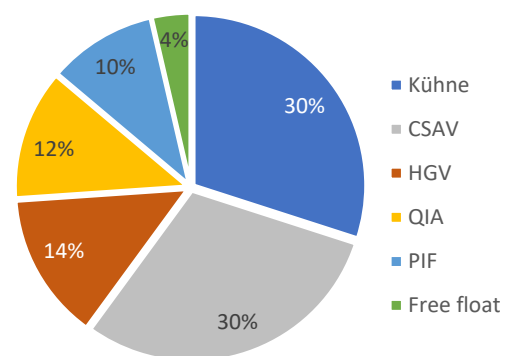
The shareholder structure of Hapag-Lloyd remained unchanged during 2021, owned by its five largest shareholders, which collectively held **96.4% of share capital** (Figure 16) with **total 175.76m of ordinary shares**. These included *Kühne Maritime GmbH together with Kühne Holding AG* (Kühne), *CSAV Germany Container Holding GmbH* (CSAV), *Hamburger Gesellschaft für Vermögens- und Beteiligungsmanagement mbH* (HGV), and *Qatar Holding Germany GmbH* on behalf of the Qatar Investment Authority (QIA) and *Public Investment Fund of the Kingdom of Saudi Arabia* (PIF).

Further, under a shareholders' agreement, CSAV, Kühne and HGV have decided to exercise their right to vote from the shares in Hapag-Lloyd AG by establishing a **joint voting proxy**, enabling them to **collaboratively decide on important topics**.

## Dividend Policy

Hapag-Lloyd aims to distribute **at least 30%** of its annual consolidated earnings as a dividend, to the degree that is both legally and financially feasible. As previously mentioned, Executive Board proposed to the Annual General Meeting a **dividend of €35.00 per share**, representing a **payout ratio of around 68%**.

Figure 16. Shareholder structure



Source: Hapag-Lloyd Annual Report, Author Analysis

### 3. Management and Corporate Governance

#### Governance Structure

Hapag-Lloyd's corporate governance is established in accordance with German law, the German Corporate Governance Code (GCGC), which guarantees the rigor and legal effect of corporate governance. Therefore, Hapag-Lloyd's corporate governance is mainly **composed of two parts**: the **Supervisory Board** and the **Executive Committee**.

#### Executive board

The board of directors is the company's **business decision-making body** and is entrusted or appointed by the company's shareholders' meetings. The executive board is accountable not only to the company and shareholders, but also to employees and all other stakeholders. Therefore, the executive board needs to manage the company's business while protecting the interests of its stakeholders and execute the company's goal of **pursuing long-term value creation**.

The Executive Board **had 4 members as of 2021** (Figure 17). The Executive Board members work together cooperatively and continually update each other about important measures and events in their business areas. In general, the Executive Board **passes resolutions during regularly scheduled meetings**.

#### Supervisory Board

The Supervisory Board of Hapag-Lloyd AG advises the Executive Board on the management of the Company and **monitors its business administration**.

The Supervisory Board currently **consists of 16 members** (Appendix 8). The Supervisory Board is subject to the German Co-Determination Act (MitbestG). Accordingly, the 8 representatives of the shareholders are generally elected by the Annual General Meeting and the 8 representatives of the employees are elected in accordance with the provisions of the German Co-Determination Act.

In order to effectively perform its duties, the Board of Supervisors has **set up 4 committees** (Appendix 9), which are responsible for formulating resolutions of the Board of Supervisors and topics to be discussed at Board meetings: **Presidential and Personnel Committee, Audit and Finance Committee, Nomination Committee and Mediation Committee**.

The Mediation Committee and Nominating Committee meet only as needed. In accordance with the rules of procedure of the Supervisory Board, all other committees meet regularly and on specific occasions according to their respective responsibilities.

#### Remuneration

An important part of responsible corporate governance is to provide executive boards and supervisory boards with **compensation structures** that reward good performance. On May 28, 2021, the annual general meeting of shareholders determined the **remuneration system** for directors of the board of supervisors (Appendix 10). The total remuneration of executive board is consisted by **fixed remuneration** which includes fringe benefits, pension benefits and fixed annual remuneration, short-term variable remuneration and long-term variable remuneration (Figure 18).

Figure 17. Hapag-Lloyd Executive Board



**Rolf Habben Jansen**  
Chief Executive Officer  
Born in: 1966

Member of the Executive Board since 2014  
Chairman of the Executive Board since 2014  
Current appointment: Until 31 March 2024



**Mark Frese**  
Chief Financial Officer  
Born in: 1964

Member of the Executive Board since 2019  
Current appointment: Until 30 November 2022



**Dr Maximilian Rothkopf**  
Chief Operating Officer  
Born in: 1980

Member of the Executive Board since 2019  
Current appointment: Until 30 April 2027

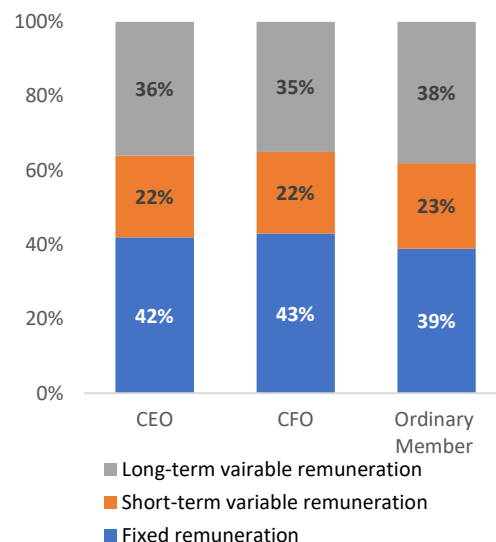


**Joachim Schlotfeldt**  
Chief Personnel Officer  
Born in: 1954

Member of the Executive Board since 2018  
Current appointment: Until 31 March 2023

Source: Hapag-Lloyd, author analysis

Figure 18. Structure of target total remuneration



Source: Hapag-Lloyd, author analysis

## ESG Development

In 2021, Hapag-Lloyd developed a new sustainability strategy with the goal of making shipping more sustainable. Hapag-Lloyd's sustainability strategy includes three focus areas:

- **Clean Shipping and Future-Proof propulsion**
- **Diversity and Society**
- **Compliance and Responsibility**

In these three areas, Hapag-Lloyd has identified eight key themes (Appendix 11) and their respective goals and measures and will plan to achieve these themes from 2022 onwards.

### Clean Shipping and Future-Proof propulsion

For Greenhouse gases, Hapag-Lloyd will drive decarbonisation by focusing on future-proof technologies and climate-neutral fuel sources with the goal of climate neutral by 2045 (Figure 19). For clean air, the commitment to zero-emission shipping underpins the goal of continually reducing emissions of air pollutants at sea and on land. Moreover, the company will also continue to pursue this goal using sustainable fuel types: biofuels and other alternative fuels which not only help reduce greenhouse gas emissions, but also help reduce the amount of air pollutants emitted.

### Diversity and Society

Hapag-Lloyd intends to get more diverse, with the goal of boosting gender diversity and cultural diversification in management positions with the promise of raising the number of female employees in management trainee programs to 50% by 2023. The company, on the other hand, takes responsibility for social and environmental topics. It is aimed to encourage employee social participation by concentrating on educational activities, humanitarian aid, and ocean protection.

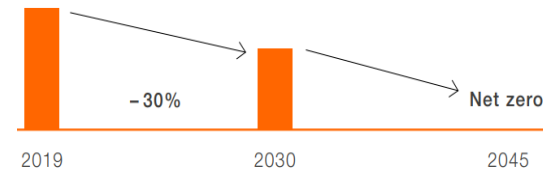
### Compliance and Responsibility

For resource conservation, Hapag-Lloyd is a founding member of the Ship Recycling Transparency Initiative to save resources by making the circular economy a reality for the shipping industry. For transport care, Hapag-Lloyd is constantly striving to improve its services and guarantee the safe transportation of its goods with the establishment of a central monitoring system. For biodiversity, the company continues to protect the ocean and marine life and avoid all violations related to ballast water and releases.

## ESG Metrics

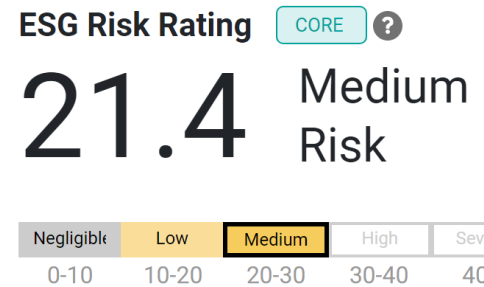
This research assesses the ESG commitment of Hapag-Lloyd by using Morningstar Sustainalytics ESG Score, which concentrates on evaluating a firm's exposure to industry-specific relevant ESG risks and how effectively a company is managing such risks. The company has a score of 21.4, which is in line with its competitors and indicates a medium risk, placed 102<sup>nd</sup> in the transportation industry.

Figure 19. Planned reduction of CO2 intensity



Source: Hapag-Lloyd Sustainability Report 2021

Figure 20. Hapag-Lloyd ESG score



Source: Morningstar Sustainalytics, author analysis

Table 2. ESG score

Company	Risk Score	Ranking
Maersk	17.0	38
Hapag Lloyd	21.4	102
COSCO	26.3	230
SITC	25.7	213
Evergreen	23.2	154

Source: Morningstar Sustainalytics, author analysis

## 4. Industry Overview and Competitive Positioning

### Economic Outlook

#### Global GDP

Since 2019, U.S. stocks have continued to hit record highs. The three major indexes, S&P, Dow Jones, and Nasdaq have risen significantly and set new highs repeatedly. The global annual growth rate slowed in all regions afterward, especially in the region of Asia and the Pacific. As shown in Figure 21, all regions of the world experienced negative growth in 2020 due to COVID-19. Moreover, in the fourth quarter of 2020, the impact of the second wave of the COVID-19 caused some countries and regions to restart lockdown, and the global economy was in a downturn. The **global real GDP reached -3.1%** due to a decrease of -5.9% YOY in 2020, and **inflation faced a decrease of 0.3% to 3.2%**.

However, the global economic in 2021 is generally more optimistic than in 2020, with major economies beginning to accelerate their recovery at the end of the year. Driven by the expectation of good progress in vaccine research and development and vaccination, major economies have shown a positive rebound trend, leading **the real GDP recover to 5.9%** showing a 9% YOY increase, while **inflation jumped by 1.1% to 4.3%**.

For 2022, with COVID-19 still not entirely controlled, the Russia-Ukraine war, and current lockdowns in China, the future for the global economy remains clouded by uncertainty. The outlook for macroeconomic policies will be even more critical. The support and stimulus plan issued in response to the Covid-19 will be phased out, which brings new challenges to policymakers and new risks to the financial market. In addition, financial market risks have the characteristics of being easy to burst, easy to spread, and difficult to deal with. As a result of all considerations, Pricewaterhouse Coppers (PwC) is anticipated that **global real GDP growth would slow by 1.4% to 4.5%** and **inflation will edge up to 5.1% by 0.8%**.

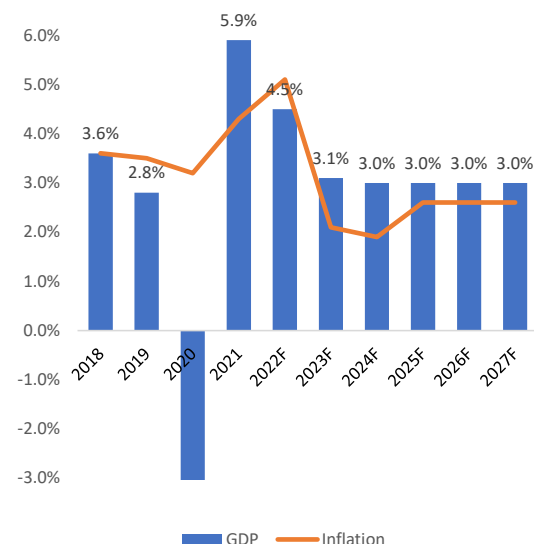
#### Global Maritime Trade

The effects of global demand for trade on the logistics industry are fast, direct, and significant as the industry is driven by companies' needs to get goods from one place to the other. As observed in Figure 22, global merchandise trade fell by 2.76% in 2019 subsequent to increase for two years, decreasing to \$19 trillion. In 2020, due to **lockdown caused by Covid-19**, exports experience a sharp drop in the first two quarters. Nevertheless, the damage was not as severe as first anticipated, and the maritime transportation industry was able to weather the storm. However, even with a considerable recovery in the following quarters, the exports in 2020 still decrease 7.36% YOY to \$17 trillion.

As showed in Figure 23, in 2020, there is a **decrease of 3.8% YOY** in world maritime trade, resulting in 10.6 billion tons. The decrease mainly comes from the dry cargo. The trade faces a recovery from the third quarter of 2020 because consumer demand increases driven by the economic revival in East Asia and the US. With vaccinations becoming more widely accessible in different countries, the trade is likely to continue to increase in the foreseeable future, although this will mostly rely on the afterlife of pandemics and the related lockdown or restrictions imposed by governments.

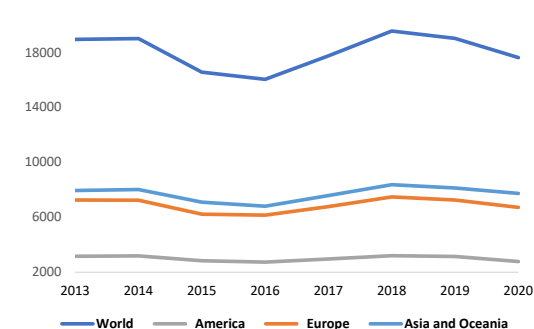
The demand for marine trade globally is **directly correlated with world GDP** (Figure 24). Because the logistics sector is driven by businesses' demands to transfer products from one location to another in response to demand for global trade.

Figure 21. Global GDP and inflation



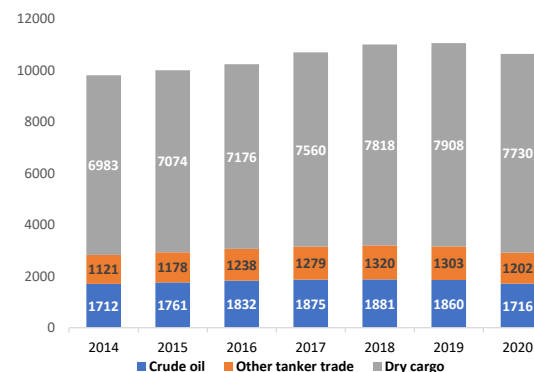
Source: PwC Projections 2022, Author Analysis

Figure 22. Total Exports Value (US\$, billion)



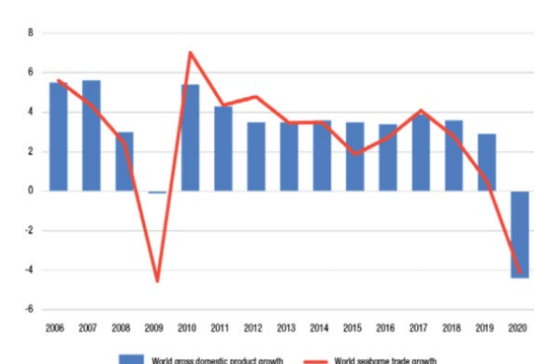
Source: UNCTAD 2021, Author Analysis

Figure 23. World maritime trade by types of cargo



Source: UNCTAD 2021, Author Analysis

Figure 24. World GDP and seaborne trade growth



Source: UNCTAD 2020

According to UNCTAD, **world maritime trade recovered to 4.3% in 2021**, and the growth is expected to moderate and expand at **2.4% YOY between 2022 and 2026**. However, both short-term and long-term prospects are still unclear. Figures are subject to changes in COVID-19 trends, notably in China, in consumer demand as a result of greater inflation and tighter monetary policy, and as a consequence of the European debt crisis.

## Container Liner Shipping Industry Outlook

### Market structure

The **market structure** of the industry **resembles an oligopoly**. There are very few large players, with the 10 largest companies by market share controlling close to 85% of the market of **which the 5 largest combined enjoy a total market share of 64%** (Figure 25). There are significant entry barriers and limited product differentiation. The reason is that major players are interdependent because of shipping alliances, slot charter agreements, and vessel sharing agreements. Companies in the industry have a worldwide geographic coverage, and a wide range of routes. Due to its highly sensitive to business cycles and the general status of the economy, the industry shows cyclical behavior.

### Industry Consolidation

Over the past decade **market consolidation** in the global shipping industry has **been increasing**. This is observed by the increase of mergers and acquisitions between shipping lines, a **reshuffling of alliances** and **expansion of some shipping companies into port operations**. By consolidating and joining alliances, companies can improve their rates, earnings, and financial returns. Moreover, they are able to combine their operations, improving supply management and fleet utilization, pool cargo, leverage economies of scale, reduce operating costs and share resources and networks.

As can be seen in Appendix 12, the market landscape has changed over the past decade as some companies with reduced market share have been acquired by **leading companies or merged**. This was the case for ONE, which originated from the merge of Japanese companies K-Line, MOL and NYK Line in 2017.

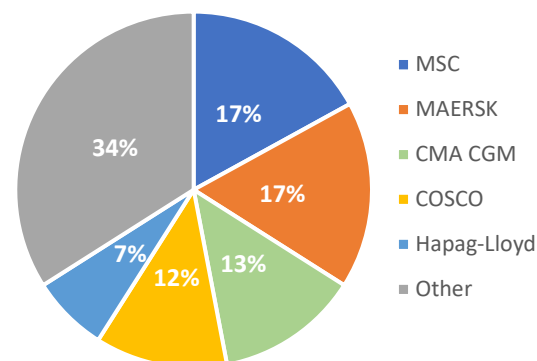
### Alliances

The major shipping alliances, 2M alliance, THE alliance and Ocean, alliance were formed in **2017** and account for **81% of the global container market**. Alliances are an important consideration of the container shipping business since they allow for better ship utilization and allow shipping companies to deliver a more comprehensive service. With these alliances, shipping companies can save expenses and increase utilization rate by sharing vessels. Three major alliances are:

- **2M alliance:** Maersk and MSC, a 10-year vessel sharing agreement, including 185 vessels with a capacity of 2.1 million TEUs, accounting for 34% of market share.
- **Ocean alliance:** COSCO, CMA CGM, and Evergreen, a 10-year vessel sharing agreement, including 330 vessels with a capacity of 3.8 million TEUs, representing 20% of market share.
- **THE alliance:** Hapag-Lloyd, ONE, Yang Ming and HMM, including 261 vessels with a capacity of 4.5 million TEUs, standing for 17% of market share.

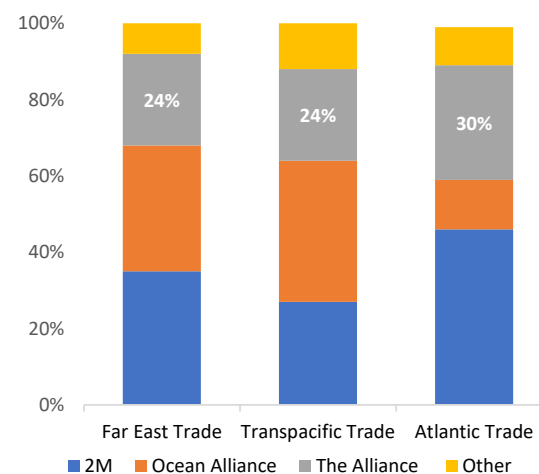
As at 2021YE, "THE Alliance" covered all East–West trades with 255 container ships and 29 services (Figure 26).

**Figure 25.** Market shares of top 5 companies in 2021



Source: Alphaliner Top 100, author analysis

**Figure 26.** Capacity share of the alliances



Source: Hapag-Lloyd Annual Report, Author Analysis

## Industry Trends

### Digitalization

Digitalization is becoming more and more relevant to the ocean shipping industry. Developments in **AI, automation, blockchain technology and IoT** can help generate new business opportunities, develop and adapt supply chains and boost overall geographic trading.

With the process of digitalization there are three cases to be highlighted regarding strategies that companies are adopting that may boost their efficiency with respect to vessel technology:

- **Maintenance predictions:** This new technology allows for improved monitoring and prediction of when equipment problems may occur, reducing maintenance costs which is relatively considerable in the industry.
- **Digital twin:** Enables the digitalization of vessels without installation of expensive equipment for the monitorization of the consumption of fuel.
- **Monitoring performances:** Fleet management is notified beforehand of any unusual situation onboard, thus reducing risks mid-voyage

Although this presents opportunities to maritime shipping companies, they will also need to be cautious and aware of the risks and costs.

### E-commerce

COVID-19 **altered people's consumption behaviors**. As a result of international lockdowns, there was a **tremendous growth** in e-commerce as a response to closed stores (Figure 27) - people were unable to buy their daily goods were forced to seek alternatives in online shopping. As a consequence, during the early stages of the epidemic, online shopping companies such as Amazon and Alibaba **witnessed a surge in demand**, which was beneficial to maritime shipping business.

The pandemic was not the only reason for the expansion of e-commerce; faster, cheaper, and wider access to the internet contributed to a boost in online retail, with about **63% of the global population** having access to the internet in March 2021 (Figure 28), indicating a 31.8% increase in 10 years. Compare with September 2011, just 31.5% of the worldwide population had internet connection. The **extensive and consistent expansion of worldwide internet** connectivity is projected to contribute favorably to the ongoing expansion of online shopping.

E-commerce has a **positive effect on ocean shipping** as:

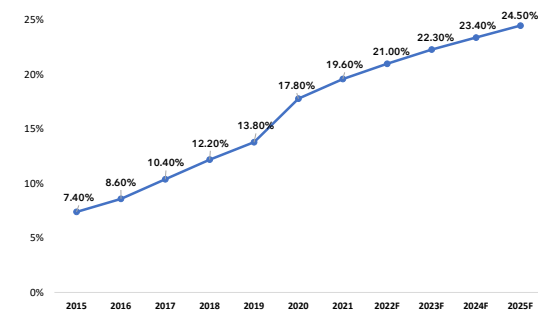
- Companies have a greater need to **integrate supply chains**,
- There is an **increment in international demand** for products outside their country of production
- There is a **greater demand for B2C and C2C shipping** to which carriers will have to adapt in order to better suit their buyers' needs.

### Decarbonization

How to reduce carbon dioxide emissions in the atmosphere caused by human activities has been one of the biggest global concerns in this century. Maritime shipping was responsible for around **2% of global CO<sub>2</sub> emissions** (Figure 29). Looking forward, ocean shipping companies will have to **adapt towards a process of decarbonization** and become more ESG friendly.

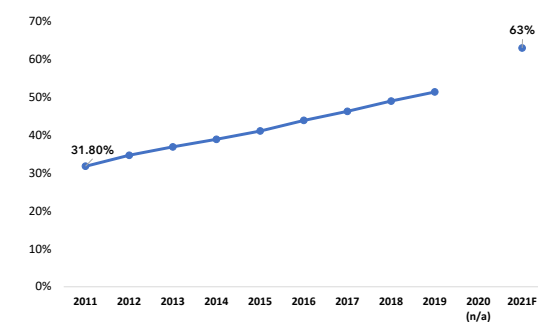
Total emissions from the industry have **fallen by 14% since 2008** due largely to the adoption of **slow steaming** and **larger and more efficient vessels**, in line with the **target of IMO** (Appendix 13) - reduce global emissions from shipping by

Figure 27. E-commerce as % of global retail sales



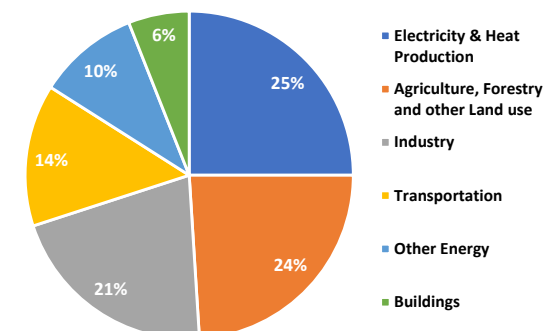
Source: Statista, author analysis

Figure 28. Global Internet penetration rate



Source: Statista, author analysis

Figure 29. Global GHG emission by sector



Source: C2ES

at least 50% from 2008 level. As a result, to comply with stricter, more recent regulations companies' strategies will lean towards **improving vessel technology**, such as through fleet management and voyage optimization; improving port management to avoid queueing; and using cleaner sources of fuel. In order to achieve climate stabilization goals, companies must **reevaluate the way they consume energy** and which source of energy is being used in order to **switch to lower emission energy sources or renewables**.

## Supply & Demand Drivers

### Container port throughput

Container port throughput presents the estimated **total number of containers handled**, per country, expressed in TEUs. The world's container port throughput **has been increasing from 2013 to 2019** (Figure 30). Due to COVID-19, the container port throughput fell due to lockdown restrictions, especially in Europe. The world container port throughput suffered a decrease of 1.09% YOY in 2020 to 816 million TEU after continuous growth for a near-decade. Projected figures for 2021 **expect volumes to have grown by 10.1%**, in line with the global COVID-19 recovery.

The general rebound of the world economy that led to increase in the flow of goods and services, coupled with the development and standardization of port logistics has led to a more efficient global container throughput network, thereby increasing efficiency on a global scale. In the future, global container throughput is **likely to continue to increase**.

But container port throughput is potentially hampered by logistical difficulties and bottlenecks, especially the port infrastructure. Because most vessels need to wait for upload or discharge in port due to the limitation of productivity. If congestion happens in port, there would be an **increasing cost** for companies, such as the surcharges, demurrage, and detention fees

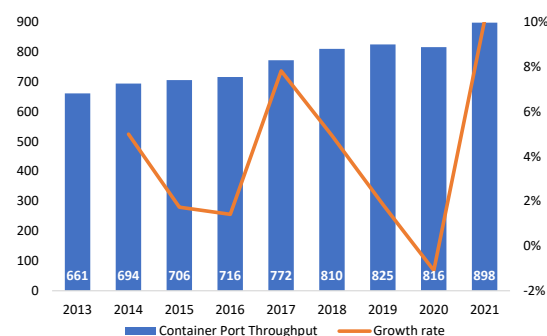
### Container availability

Container availability refers to how many **empty containers are available** that can fit in one vessel and whether there is enough space available inside those containers to fulfill customer orders. Because of COVID-19, government was imposing lockdowns which led to a reduction in the production of goods as well as exports and imports. Shipping companies were negatively impacted and had to reduce the number of cargo vessels being sent out resulting in uncollected empty containers in several ports.

Other unexpected conditions may also leave a considerable number of empty containers behind in ports or increase the amount of time needed to retrieve containers such as labor shortages and layoffs, port congestion and trade imbalances. An imbalance between exports and imports aids to exacerbate container availability issues. The container volume growth rate was negative in 2020 but is **forecasted to bounce back to 5.70% in 2021** (Figure 31).

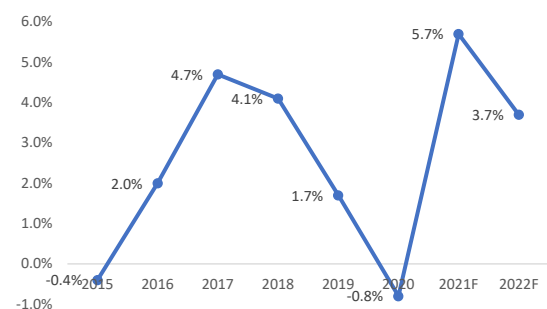
Maritime shipping firms had to adapt in order to prevent container shortages. Companies decreased their container refilling and emptying times to increase efficiency. Other alternatives are reusing old containers to fulfill increases in demand and a better cooperation between port terminals, shipping lines, and competitors to better prepare for unprecedented situations. As forecast by UNCTAD, container volume growth will face a **slow down in 2022, to 3.70%**.

Figure 30. Container port throughput



Source: UNCTADstat, author analysis

Figure 31. Container volume growth



Source: UNCTADstat, Author Analysis



## Profitability Drivers

### Freight rate

Freight rates refers to the **price requested** for the transportation of goods from one place to another. Usually, depending on the weight of the shipment and their final destination. It is also under the jurisdiction of the governments of all countries and regions around the world. Therefore, the container freight rate will also be affected by government factors such as the political system, economic structure, and shipping policies of each country.

After Covid-19, the global economy **began to recover in the second half of 2020**. There was an unexpected rise in demand for containerized and goods, resulting in a shortfall of shipping capacity due to a lockdown-induced labor shortage. Also, the disruption of the Suez Canal caused the deficiency of containers. As a result, **freight rates have increased significantly** with rising surcharges. As demonstrated in Figure 32, the freight rate started to increase in July 2020, and reached 10323 dollars per 40 TEU in September 2021, with an unexpected rise of 359% YOY.

Capacity growth may not be enough to keep the freight rate stable if the demand continues to rise, given supply-side constraints like port capacity, especially in the context of the current COVID-19 developments in China. The conflict between Russia and Ukraine also raises the likelihood that volumes between Asia and Europe that are presently transported by land and air may be added to the need of ocean shipping. As a combination of **supply and demand uncertainty**, it is anticipated that freight rates will remain at relatively high levels in the near future.

### Fleet carrying capacity

Fleet carrying capacity refers to the **carrying capacity** of the world merchant fleet measured by deadweight ton (DWT) which is the weight measure of a vessel's carrying capacity, including cargo, fuel, and stores. As shown in Figure 33, the world fleet reaches 2.1 billion DWT. During past decades, the world fleet continued to grow, with the most obvious growth being oil tankers and bulk carriers. As demonstrated in Figure 34, the annual growth rate of the **world fleet keeps around 3%- 4%**.

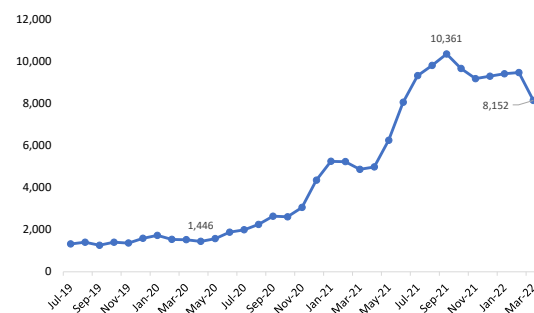
Furthermore, because many shipping firms are increasingly using ultra-large container ships (ULCS), container ship capacity has grown substantially. With the gradual recovery of world trade in the second half of 2020 and the first half of 2021, as the demand for energy in different countries increases, the demand for freight is also increasing. Therefore, due to the increase in the total fleet in the future, the fleet carrying capacity will **continue to increase**.

According to the publication of UNCTAD (Figure 35), between 2011 and 2021 the proportion of mega-container ships rose from 6% to 40% of the total fleet carrying capacity. This gives pressure on the infrastructure and logistics at ports since they are oversized. It has become a **serious concern for essential nodes** of the global maritime transport network since they have been making more journeys through the Panama and Suez canals since 2012. If the obstruction of the Suez Canal happened once again, that would be another calamity for the whole industry.

### Oil price

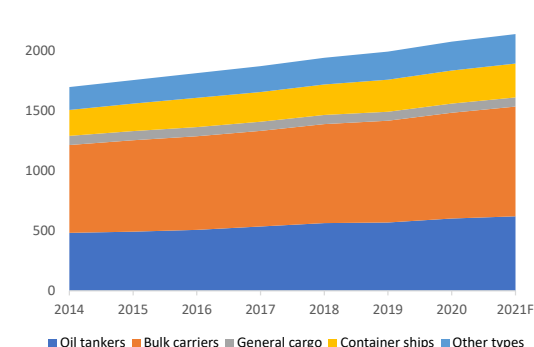
Oil prices play an **important role** in the **cost structure** of maritime shipping companies because firms need oil to run their business and to travel around the ocean, it is on the nature of such industry: on periods that oil prices are significantly stable and low companies might set more affordable prices to attract

Figure 32. Freight Rate Index evolution



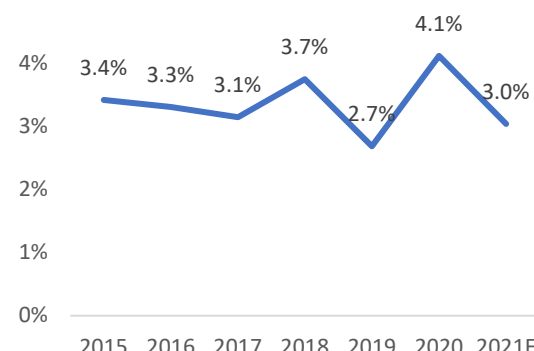
Source: Statista, Author Analysis

Figure 33. World fleet by principal vessel type



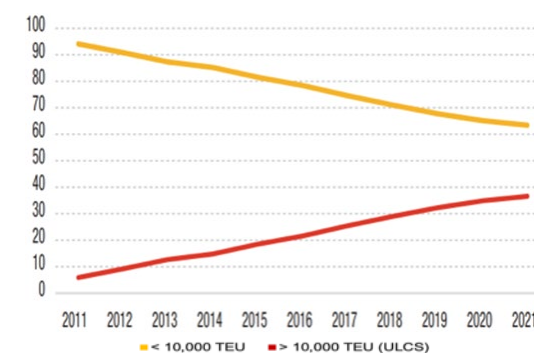
Source: UNCTADstat, Author Analysis

Figure 34. World fleet growth rate



Source: UNCTADstat, Author Analysis

Figure 35. ULCS as % of global containership fleet carrying capacity



Source: UNCTADstat

potential customers and report higher margins and profits or recover from past losses that might have incurred and therefore oil price can have a significant impact on firms' margins (Figure 36). Additionally, oil prices have been found to have a larger effect on freight rates during periods of **higher volatility and rising prices** (UNCTAD, 2010).

Following an adverse environment in a post-pandemic 2020 (Figure 37), the oil and gas industry has rebounded strongly in 2021, with 2022 marking oil prices reaching their **highest levels in six years**. The average annual price of Brent crude oil climbed to **US\$103** per barrel as of May 2022, over US\$30 higher than the annual average price in 2021 and comes in the wake of an energy supply shortage that began gripping Europe in late 2021, as well as concerns over oil supply bottlenecks following the Russia-Ukraine war.

Although oil prices remain highly uncertain and strongly correlated to current and future political events, prices are **expected to stabilize** following the second half of this decade according to the ECB projections.

### Vessel price

In 2020, the **total delivery of newbuilding** decreased 12% YOY to 57.7m gross tons. The majority of vessel types faced a decrease in delivery amounts (Figure 38), except for **bulk carriers which saw an increase of 17% YOY to 26.7m**, while the main reduction came from oil tankers, with a decrease of 39% YOY to 12m.

The paramount reason behind this situation is the **lockdown-induced labor shortages** during the first half of the year that disrupt marine-industry activity. Currently, the shipbuilding industry is dominated by east Asian countries. From 2015, the market share of shipbuilding has been mainly dominated by four countries - **China, the Republic of Korea, Japan, and the Philippines** (Figure 39), from 94.1% in 2015 to 95% in 2020.

In 2020, China has the largest market share of 40.3% percentage with 5% YOY increase. China's leading position in the shipbuilding industry comes from **cost advantages and the strong government support policy** to improve capabilities and expand capacity.

However, the shipbuilding industry still faces the challenge of **IMO's regulations** on the ballast water treatment and Sulphur emissions. COVID-19 **increased uncertainty for shipowners** to invest in the newbuild market. Vessel price did not change significantly in recent years (Appendix 14). Due to the pandemic, the shipbuilding industry faces challenges in orders, production and delivery and, as such, **vessel prices for the following years remain unpredictable**. Nevertheless, maritime shipping companies often charter vessels, or at least a percentage of them. In general, **vessel prices have remained relatively constant in the past 5 years**.

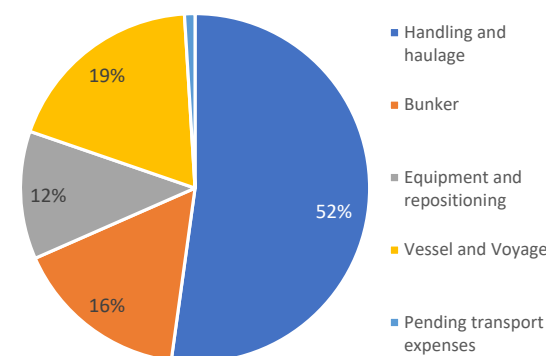
## Competitive Environment

### Peer identification

There are various classifications approaches to identify comparable firms. This research selected the **Bloomberg Industry Classification System (BICS)**, which classifies companies according to their core business activity. As a result, companies solely or mainly operate in the container shipping industry are selected.

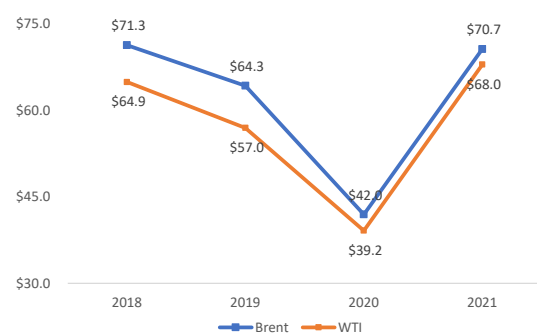
In addition, ownership and size were taken into account while selecting the most similar peer group. It is made up of five companies (Table 3, Appendix 15): **A.P.**

Figure 36. Transport cost structure



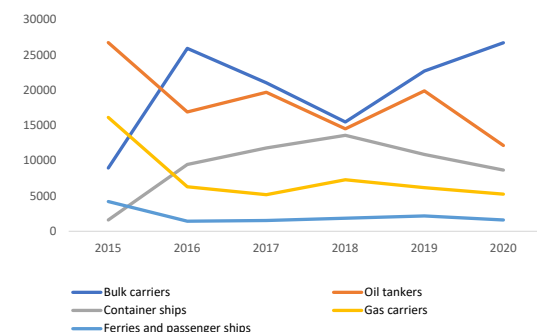
Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 37. Average historical crude oil prices



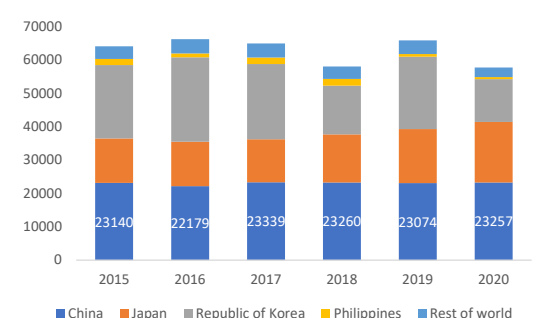
Source: Statista, Author Analysis

Figure 38. Deliveries of newbuilds by vessel



Source: UNCTADstat, Author Analysis

Figure 39. Deliveries of newbuilds by country



Source: UNCTADstat, Author Analysis

**Moller-Maersk A/S, COSCO Shipping Holdings, SITC International Holdings, Orient Overseas Container Line and Evergreen Marine.**

**Peer strategies**

Considering the market structure of the industry, peers' **strategies in the short-term are mainly focused on non-price competition** such as improving service quality and efficiency, offering logistics solutions, accelerating innovation and digitalization in operations, and enabling sustainable supply chains (Appendix 16). Important **strategies in the long-term** include **strengthening joint operation strategies** to increase opportunities in new markets, **replacing and renewing ships** to continuously improve service quality and adapt to environmental protection, and **participate in initiatives to facilitate improvements** in the maritime industry.

**Porter's 5 Forces**

Since the introduction of containerization, the industry has become very standardized with high homogeneity between products. While incumbents pursue to adopt 3PL and 4PL strategies to differentiate themselves, standardization still remains a strong driver in the industry, pushing profitability downwards and defining key forces (Figure 40, Appendix 17). For example:

- **The bargaining power of buyers is Medium-High** given the highly homogeneous nature of the products and the low cost of switching. Even though there has lately been a trend toward longer contracts between incumbents and customers, raising switching costs, it will take time for the industry as a whole to shift.
- **The rivalry among existing incumbents is Medium** taking into account buyer bargaining power and product standardization. Non-price competition is robust due to high hurdles to departure and a small number of notable competitors; nevertheless, price-competition will be a more present concern if competitors did not join ocean shipping alliances. Without them, competition among current players would be intense.

Despite these strong forces, the industry benefits from being an essential part of world trade with virtually no substitutes. For example:

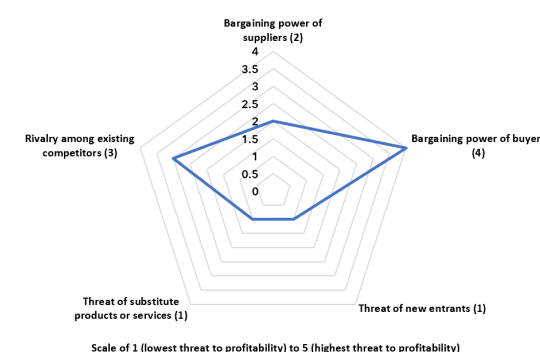
- **The threat of substitutes is LOW** as ocean shipping is the most cost-efficient way of transporting large quantities of goods internationally (Figure 41). Buyers might choose to transport by rail, road, or air, but doing so would need numerous shipments in smaller consignments, generating more costs and time. Nonetheless, rail is still employed as an alternative to maritime shipping, particularly during times of conflict or disruption. As a result of the COVID-19 situation in China, for example, there are trains bringing cargo to Europe. Furthermore, only exceptionally large merchants (e.g., Amazon or Alibaba) might handle their own shipping demands, whereas small and medium-sized buyers find it virtually difficult. Thus, the industry has no direct substitutes. One possible indirect substitute could be 3D printing, although that will take potentially many years to develop, or will never develop, enough that buyers will either have no one to sell to, as all goods are produced individually, or they will not have to resource raw materials internationally.
- **The power of suppliers is MEDIUM-LOW** as they heavily depend on the industry and supply relatively homogenous goods and services. The main suppliers for the industry are shipbuilders and ship-scrappers, charter owners, canal owners, terminals, and bunker suppliers. Bunker suppliers are

**Table 3. Peer selection**

Company	Ownership	Geography	Market Cap	Peer
MAERSK	POC	Global	\$ 51,708.30	YES
Hapag-Lloyd	POC	Global	\$ 46,679.20	YES
ZIM Integrated Shipping	POC	Global	\$ 5,665.10	NO
Matson	POC	Asia/Pacific	\$ 3,235.40	NO
COSCO Shipping	POC	Global	\$ 40,239.50	YES
HMM	NOC	Global	\$ 11,484.70	NO
Regional Container Lines	POC	Thailand	\$ 1,073.30	NO
SITC	POC	Asia	\$ 10,214.50	YES
Orient Overseas International	-	Global	\$ 17,853.30	YES
Yang Ming Marine Transport	NOC	Global	\$ 18,507.30	NO
Wan Hai Lines	POC	Asia/ME	\$ 14,362.70	NO
Evergreen	POC	Global	\$ 26,730.10	YES

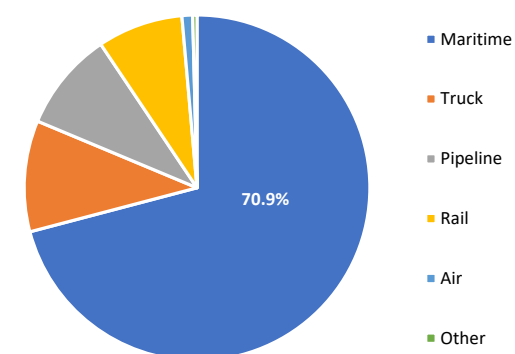
Source: Author Analysis

**Figure 40. Porter's 5 Forces**



Source: Author Analysis

**Figure 41. U.S. International Trade in Goods by Transport Mode**



Source: Bureau of Transportation Statistics; Author Analysis

**Table 4.** Most important global routes

Name
Suez Canal
Panama Canal
Strait of Malacca
Strait of Gibraltar
St. Lawrence Seaway
Dover Strait
Strait of Hormuz
Danish Straits
Bosphorus Strait
The English Channel

Source: Freightify 2021; Author Analysis

an exception as they may comprise a relatively large proportion of firm's costs and there are virtually no available alternatives yet. Owners of important trade canals, such as the Suez and Panama canals, also hold additional bargaining power. However, substitute routes are available to shipping operators (Table 4).

- **The threat of new entrants is LOW** given the large capital requirements, the large supply-side economies of scale faced by current incumbents, especially since the introduction of shipping alliances, and the legal and licensing requirements to start a maritime shipping company.

## SWOT Analysis

**Table 5.** SWOT analysis of Hapag-Lloyd

SWOT analysis	
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>-Strong <b>container capacity</b></li> <li>-Increasing <b>liquidity reserves</b> to resist challenge</li> <li>-Increasing in <b>profitability</b> indicator</li> <li>-High <b>focus on environmental</b> reporting</li> <li>-Active in <b>reefer container segment</b> with innovative technology</li> <li>-Higher <b>fleet</b> capacity</li> </ul>	<ul style="list-style-type: none"> <li>-High <b>rental margin</b> compared with competitors</li> <li>-Depreciation and amortization increase due to <b>retrofitting</b></li> <li>-Highly <b>fluctuating transport volumes</b></li> <li>-High <b>capex/ EBITDA</b> ratio</li> <li>-High share of <b>fuel cost as a percentage</b> of total costs</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>-Digitalization and <b>automation</b></li> <li>-Rising market share in <b>emerging economies</b>- Latin America, Asia, Africa</li> <li>-Extend the business model: <b>door-to-door</b> business</li> <li>-Test the first operation of a vessel with <b>LNG</b> as fuel</li> <li>-<b>Agile organization</b> – use data-based analysis tool to make faster and better commercial decisions</li> </ul>	<ul style="list-style-type: none"> <li>-<b>Economic</b> slowdown</li> <li>-<b>Trade war</b> / friction between US and China</li> <li>-Increasing <b>fuel costs</b> because of low Sulphur fuel</li> <li>-Volatile <b>exchange rates</b> between euro and dollar</li> <li>-Decreasing <b>freight rates</b></li> <li>-<b>Environmental</b> problems</li> <li>-Potential <b>M&amp;A</b> deal to more <b>concentrated industry</b></li> </ul>

Source: Author Analysis

## 5. Investment Summary

The investment recommendation for Hapag-Lloyd is **Hold**, with a **2023YE target price of €207.84** per share, implying an 17.03% upside potential, an annualized return of 17.03% based on the closing price on December 30<sup>th</sup>, 2022, along with a high risk (Figure 42).

The revenue of Hapag Lloyd **increased dramatically** in 2021 because of the high demand for goods exported from the Asian area. As a consequence, spot rates were extremely high in the market, and the company succeeded in achieving very strong results in comparison to the previous year, despite suffering an increase in transportation expenses as an outcome of severe capacity constraints in global supply chains, which presented a significant challenge to all players in the market. As a response, the company implemented measures to deal with all bottlenecks, including **reallocating transport capacity** to high-demand trade routes, further **improving the system of services**, and **diverting ships to avoid congested ports**.

As **constraints in global supply chains** will not suddenly vanish, together with **macroeconomic trends**, lead demand and spot rates remaining high in 1H 2022. The market condition is likely to progressively be improved for the rest of the year. However, recognizing that the pandemic scenario might continue for a longer period of time due to variation of the virus, current developments of war between Russia and Ukraine, **the forecast is still full of uncertainties**. On the other side, the demand for container transportation is predicted to increase as a result of the projected recovery of world economy but constrained due to the high inflation. Also, considering container ship capacity growth globally is predicted to stay at a level similar to that of the previous year, the supply and demand of the container shipping is anticipated to reach a balanced relationship in the medium term.

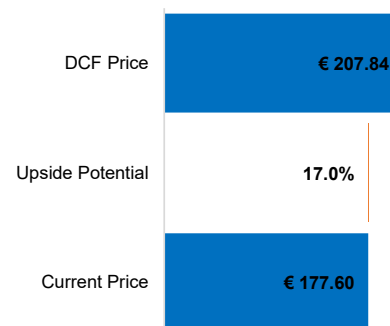
### Valuation Methods

The price target of Hapag-Lloyd is at **€207.84 per share** which was obtained through a DCF model based on the FCFFs. The two major methods used to calculate the final target price are absolute valuation which includes the **WACC method, Flow to Equity Method, Adjusted Present Value Method, Discounted Dividend Model** and relative valuation which consists of **P/E, EV/EBITDA and EV/Sales**. As shown in Figure 43 and Table 6, all method reached similar results, with a range of PT from €195.87 (price from dividend discount model) to €210.64 (price from APV method).

### Investment Risk

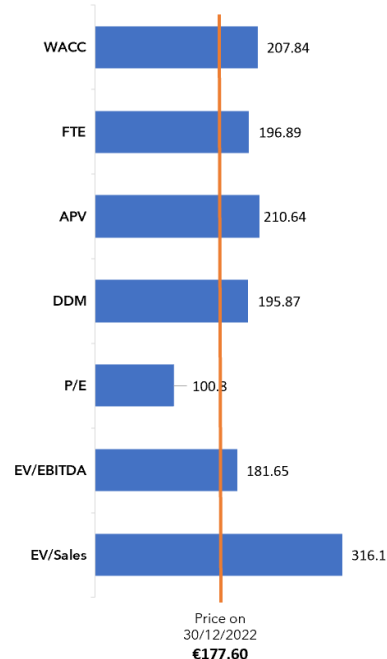
Investors should fully recognize that the business of Hapag-Lloyd is exposed to a variety of risks arising from the **market environment** and **operational activities**. On the economic side, the primary risks that the company faces are that the recovery would probably continue in weakened condition due to the quick spread of the omicron variant, as well as **rising energy costs** and **inflationary pressures** associated to the Russia-Ukraine war. Even though the company had a very successful business performance in 1H 2022, Hapag Lloyd is still facing risks from interest rates, **USD/EUR exchange rate** and fluctuation in **freight rates and transport volume** that influences revenue, **bunk consumption price** effects cost.

Figure 42. Price target as of 2023YE



Source: Author Analysis

Figure 43. Price Targets of Hapag-Lloyd



Source: Author Analysis

Table 6. Price target using different multiples

Multiples	Price
P/E	€ 100.8
EV/EBITDA	€ 181.6
EV/Sales	€ 316.1
<b>Average</b>	<b>€ 199.5</b>

Source: Author Analysis

## 6. Valuation

By using the **two stage DCF model**, we compute Hapag's Price Target of €207.84 /share in 2023YE (Figure 44& Appendix 34), which means **an upside potential of 17.03%** (corresponding to **17.03% annualized**) against the current stock price of €177.6/share. The enterprise value of Hapag is €36,530.68m when applied the FCFF model with terminal growth rate equals to 2.25% which comes from the long-term sustainable growth rate. The WACC rate that used for discounting the free cash flow is 8.32%.

The main factors that influence the valuation of Hapag are **freight rates, transport volume, the US dollar exchange rate against the Euro and operating costs including bunker price.**

### WACC Methods

#### Revenue Assumptions

Since Hapag-Lloyd only focuses on container shipping the revenue of the company comes from only one business segment. The revenue assumptions are as follows:

**The growth rate of freight rates:** as mentioned before, freight rate is not only determined by the supply and demand in the maritime trade industry, but also may be constrained by the jurisdiction of the government. As a result, freight can only be controlled to a limited level. As shown in Figure 25, the average freight rate of Hapag-Lloyd reached **\$2003 per TEU**, with an incredible **growth rate of 79.6% YoY and a 17.9% CAGR during 2017 to 2021**. The growth mostly is a result of the increasing demand benefitting as Covid has shifted consumer behavior to more consumer goods mainly produced in Asia and supply chain disruption caused by labor shortage.

Since supply remains uncertain and current evolution in the industry, the growth rate in the average freight rate of Hapag Lloyd is expected to remain at elevated levels as demand remains strong but shipping capacity is constrained. The freight rate is projected to start **decreasing slowly since 2H 2022** due to the increasing supply in the market, but in a moderate way due to the contracted rates (50% of volume) were agreed at current spot level in the long run as revealed by the company (Figure 46& Appendix 26).

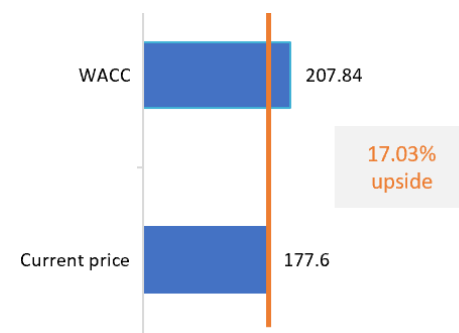
**Transport volume:** The worldwide transport volume is influenced by global market performance and therefore, also depends on the different levels of demand for shipping services. Other variables that impact the transport volume further is container ship capacity and the potential change in the competitive position in the trades. As shown in Figure 47, the transport volume was at **11,872 TTEU**, with a **4.9% CAGR during 2017-2021**.

However, the company purchased six large container vessels in last 2 years, which is expected to be delivered in 2024. The growth rate of transport volume is expected to **start from 0% and increase 0.48% per year** to reach projected world seaborne trade growth rate to match the strategy of the company to reach 10% of market share, also because of higher container volume implied from higher CAPEX investment and the congestion in supply chain will be improved in the long run. This assumption is also line with the company's guidance for 2022.

#### Cost assumption

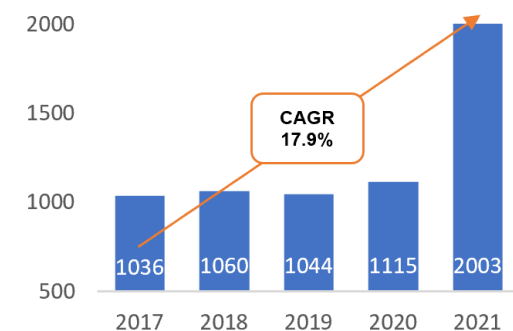
**Bunker price:** according to the annual report of Hapag-Lloyd, bunker cost was **included in transport expenses** together with handling and haulage, equipment,

Figure 44. Target Price of WACC method



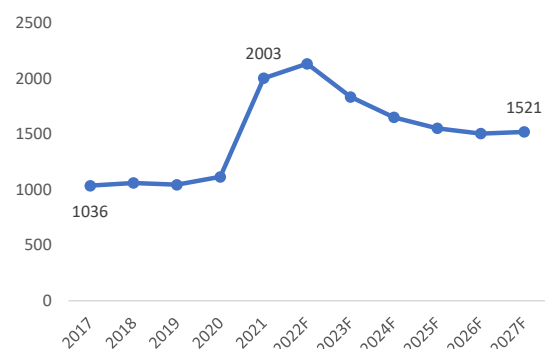
Source: Author Analysis

Figure 45. Total average freight rates (USD/TEU)



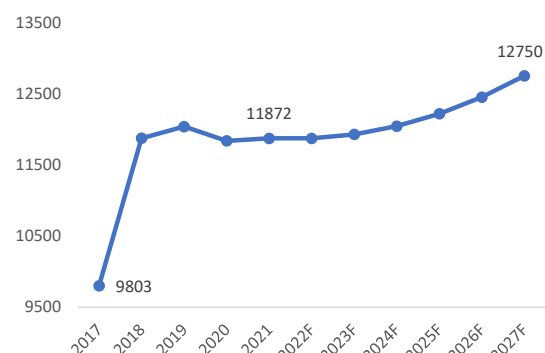
Source: Hapag-Lloyd Annual Report, Author Analysis

Figure 46. Average Freight rates



Source: Author Estimation

Figure 47. Total transport volume (TTEU)



Source: Hapag-Lloyd Annual Report, Author Estimation

vessel and voyage, and pending transport expenses. As mentioned in the industry analysis, the bunker price is correlated with the evolution of crude oil prices, so it is exposed to substantial fluctuations even a part of the volatility might be offset by bunker surcharges added to the freight rate.

The crude oil price decreased heavily in 2020 with WTI crude oil being negative due to lower demand for oil and gas caused by Covid-19. In 2021, the bunker price of Hapag-Lloyd achieved **475/t, a rise of 25.3% YoY**. Moreover, demand increases as a result of world economies recovery due to the temporary easing of the pandemic situation and the conflict of Russia and Ukraine, the bunker price is estimated to **grow with the crude oil price** which is forecasted based on Brent Crude Oil Dec Future Contract (Figure 48) as of 14, June 2022.

**Capital Expenditure (Capex):** the estimation of Hapag Lloyd's Capex includes investment in **PPE, intangible assets and right of use**. The Capex is expected to **grow in line with revenue**, with a proportion of average percentage in last 4 years to invest in replacement investment and retrofitting of ocean-going vessels and containers, also invest in CAPEX expansion. The proportion of distribution of CAPEX is estimated to **remain the same** in 2021 (Figure 49), disclosed in Note of annual report when the company starts to retrofitting due to regulation of IMO.

**Tax rate:** As a container liner shipping company, Hapag-Lloyd has opted for **taxation based on tonnage** (Figure 50). The tax liability for tonnage taxation is determined using net tonnage and the operational days of the Company's fleet rather than actual earnings. Tonnage tax applies to all income derived directly from the operating of merchant vessels in global trade. Therefore, for forecast purpose, **Marginal Tax Rates** in 2021 for shipbuilding and marine industry in Germany is used, which is **5.16%** as disclosed by Aswath Damodaran in 2022.

### Exchange Rate Assumption

**Average USD/EUR exchange rate:** since in the international container shipping industry, the US dollar is the functional currency that applies to freight and charter rate, bunker price, and so on. But because the functional price of Hapag Lloyd is the US dollar, while the reporting currency is the euro. Therefore, changes in the USD/EUR have a considerable impact on the financial performance of company. To forecast the USD/EUR exchange rate, the data derived from **OECD Economic Outlook** is used, which is **0.932 in 2022, then 0.949** in the following forecast years.

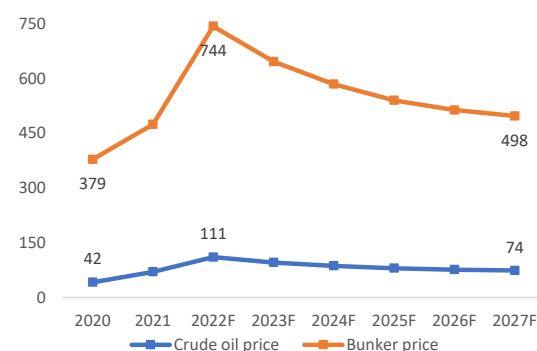
### WACC Assumptions

The discount rate of FCFF follows the WACC method is estimated based on the target capital structure, which is mentioned in 2021 annual report, as the company achieved the goal of an **equity ratio of 45%** (total equity/ total assets) set up in Strategy 2023 and prefer to maintain current capital structure.

The estimated **Cost of Equity** is calculated by using the capital asset pricing model (CAPM). The **RFR used is 2.30%**, estimated as German Bund 10Y Yield as in December 2022. **Total ERP is 5.8%** estimated by Survey done by Fernandes for Germany. **Beta is 1.17**, estimated by using the pure-play method from industry average for unlevered bate corrected for cash, the value is also proved by the regression beta vs DAX and the data disclosed by Bloomberg. The **cost of debt** is estimated to be **6.07 %** in 2023, expected to be as the average cost of debt in last 5 years.

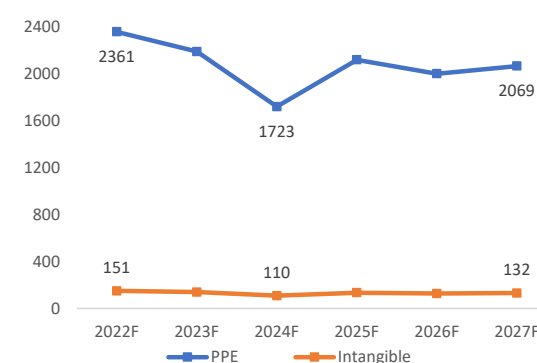
With all assumptions above, the WACC rate is estimated to be **8.32% in 2023** (Table 7) and 8.44% in follow forecast years (see Appendix 32 for detail).

**Figure 48.** Crude oil future and bunker price



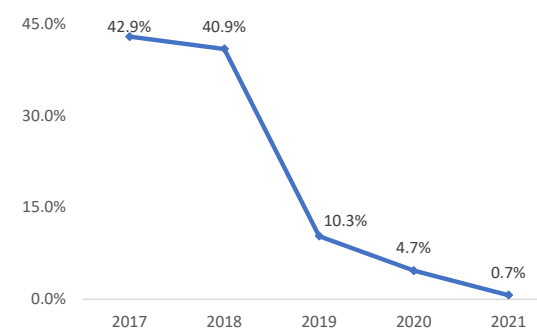
Source: Author Estimation

**Figure 49.** CAPEX composition



Source: Author Estimation

**Figure 50.** Historical tax rate



Source: Hapag-Lloyd Annual Report, Author Estimation

**Table 7.** WACC assumptions as of 2023YE

WACC Assumptions	
Rf	2.30%
Beta	1.20
ERP	5.80%
Re	9.27%
E/(E+D)	72.92%
Rd	6.07%
(1-t)	94.84%
D/(E+D)	27.08%
WACC	8.32%

Source: Hapag-Lloyd Annual Report, Author Estimation

**Table 8. Stable Growth Model Estimation**

Terminal Growth Assumption	
Capex	2154.40
D&A	1480.38
ΔNWC	-139.73
EBIT (1-t)	3569.83
Reinvestment Rate	14.97%
EBIT (1-t)	3569.83
Total Assets	32282.07
ROA	11.06%
D/E	73.51%
Cost of debt	5.97%
Taxes	5.16%
ROE	15.03%
Growth Rate	2.25%

Source: Hapag-Lloyd Annual Report, Author Estimation

### Terminal assumptions

The second stage from the DCF model includes normalized FCFF for the terminal period which is calculated from the average FCFF in the forecast years to reduce the impact of business cycle and long-run sustainable growth rate, which is **2.25%** (Table 8), computed by using a stable growth model, that is  $g = \text{reinvestment rate} \times \text{ROE}$ .

For computation of terminal growth rate, another two methodologies are used – 0.15% from Dividend Sustainable Growth Rate and 5.06% from Fisher Formular, also take the economic factor – a 2.40% long-term growth rate for world seaborne trade, published in Review of Maritime Transport 2021, by UNCTAD (Figure 51& Appendix 33).

### Flow-to-Equity Method

The Flow-to-Equity is calculated to complement the FCFF model based on the WACC method because the valuation assumes a stable capital structure. As shown in Appendix 35, the price target of the FTE model is **€196.89/share** as of 2023YE (Figure 52), with a cost of equity equal 6.56% in forecast years. This indicates a **potential upside of 10.86%**, which is close in value to the one reached using the WACC method.

### Adjusted Present Value Method

As shown in Appendix 36, the adjusted present value model was also applied by discounting the normalized FCFF with the unlevered cost of capital of 8.4% which is calculated in a similar way to the cost of capital in WACC method and adding back the tax shield benefit which is calculated by using the cost of debt to discount the interest expense. By using this method, the price target is **€210.64/share** as of 2023YE (Figure 53), with a **potential upside of 18.60%**, which is also a proxy for the target price from WACC method.

### Dividend Discount Model

Considering Hapag-Lloyd’s high level of dividend payout ratio, it is rational to apply the dividend discount model. A 2-stage model is applied in this method, the first stage considers the expected dividend payout for shareholders, the terminal dividend growth rate is the long-term growth rate, which is **2.25%**.

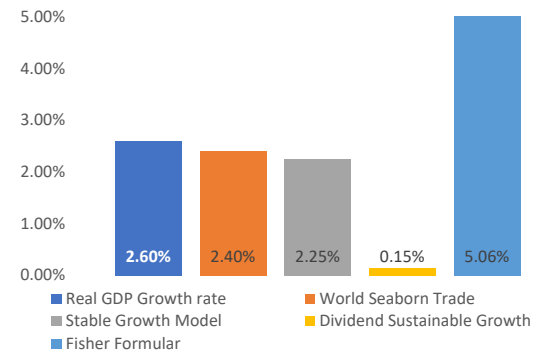
As a combination of common dividend is forecasted to decrease due to lower net income, the cash of the company is accumulated till higher than 10% of the total assets. The company plans to keep a dividend level to maintain the expectation of investors a special dividend is expected starts in 2024. The price target of this model is **€195.87/share** in 2023YE (Figure 54), with a discount rate of 6.56%, implying a **potential upside of 10.29%**.

### Multiples Based Approach

As an alternative method, this research also presents a price range for Hapag-Lloyd using the relative method. For indicators that are used in this approach, this research selected 2 enterprise value multiples that are EV/EBITDA, EV/Sales, and 1 price multiples, the P/E ratio.

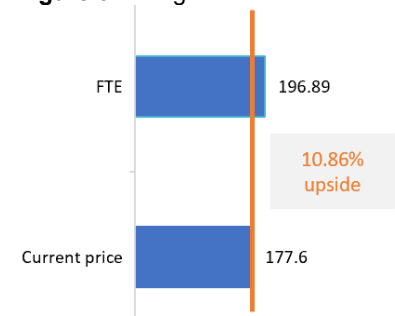
EV/EBITDA: with the industry average EV/EBITDA ratio of 4.4x, this research gets an enterprise value of €31,926.0m, which leads to a price target of €181.65/share in 2023YE.

**Figure 51. Different growth rate**



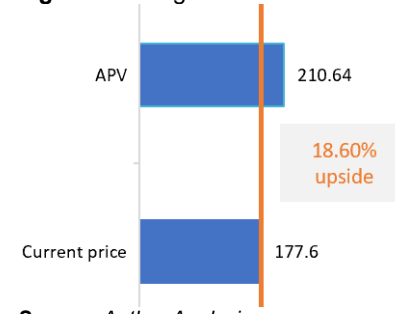
Source: Author Analysis

**Figure 52. Target Price of FTE method**



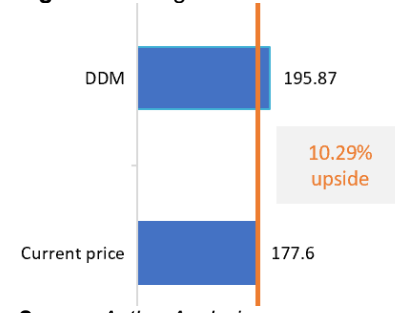
Source: Author Analysis

**Figure 53. Target Price of APV method**



Source: Author Analysis

**Figure 54. Target Price of DDM method**



Source: Author Analysis

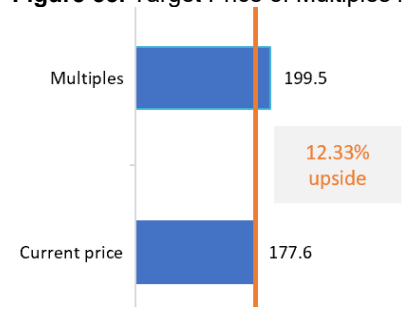


EV/Sales: with the industry average EV/s ratio of 2.4x, this research gets an enterprise value of €55,565.0m, which leads to a price target of €316.1/share in 2023YE.

P/E: with the industry average P/E ratio of 4.15x, this research gets an equity value of €17,710.5m, which leads to a price target of €100.8/share in 2023YE.

The average of this model is **€199.5/share** in 2023YE (Figure 55), with a **potential upside of 12.33%**.

**Figure 55.** Target Price of Multiples method



**Source:** Author Analysis

## 7. Financial Analysis

Hapag-Lloyd managed to present a record financial performance in 2021 due to the sharp rise in freight rate, leading to a significant improvement in all financial ratios.

### Profitability Analysis

As mentioned before, the profitability of Hapag-Lloyd was improved in 2021 shown by the incredible increase in all profitability indicators: EBITDA margin and net profit margin increased to 48.7% and 40.8% respectively, ROA and ROCE reached 34.0% and 44.1%.

As mentioned in the industry analysis, the freight faced a sharp rise in 2021 which is expected to drop in the following year. Shown in Figure 56, with the increase of bunker price, all the profitability ratios show a decreasing trend. Nevertheless, the profitability is forecasted to return back to pre-pandemic level.

### Liquidity Analysis

Thanks to the improved profitability, the liquidity ratio also shows a better result in 2021, showing a strong ability of the company to meet their short-term obligations. The current ratio of Hapag-Lloyd stood at **1.92x** (Figure 57), with a **24.71% CAGR during 2017 to 2021**, representing that the company has enough current assets to cover its obligation within 1 year. The quick ratio posted at **1.82x with a 26.55% CAGR** during 2017 to 2021 and cash ratio at **0.68x with a 23.36% CAGR** during 2017 to 2021.

From 2022 onwards, the liquidity ratios of Hapag-Lloyd are expected to raise at a **CAGR** of near **3%** due to improved profitability will be accumulated, which is also proved by the 1H 2022 financial results, then drop back to 2021 levels in 2027.

### Solvency Analysis

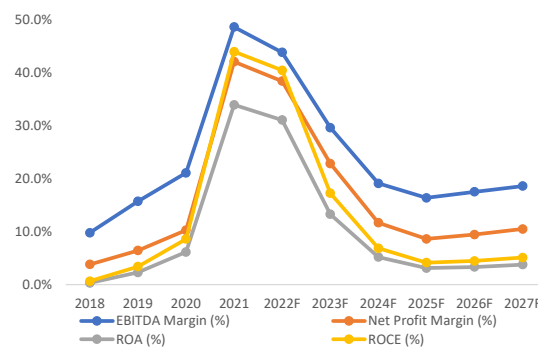
As a part of the business strategy, Hapag-Lloyd set up the objective that the net leverage (**net debt / EBITDA**) would be below **3**, which was achieved in 2021 proven by net cash position. Moreover, the goal of enhancing the capitalization shown by equity ratio higher than 45%, also was accomplished as the **equity ratio was 60%** in 2021. Therefore, the company set the financial target as **maintain current financial structure**.

Shown in Figure 58 and Appendix 21, the financial leverage of Hapag-Lloyd is expected to increase from 0.34x to 0.74x, due to the company have to finance the almost €2bn payment for the two signed newbuild agreements (each for construction of 6 large vessels). This financing will be paid by numbers of instalments until final delivery, with the largest part of the payment due with delivery of the vessel in 2023 onwards. As a result, the debt ratio is projected to increase from 20.58% to 35.87%, and **long-term debt ratio at 27.99%**, indicating that the company will take more long-term finance to avoid short-term liquidity constraints. The interest coverage ratio is also anticipated to decrease to 2.93. However, the expectations are still better than the results in 2020.

### Efficiency Analysis

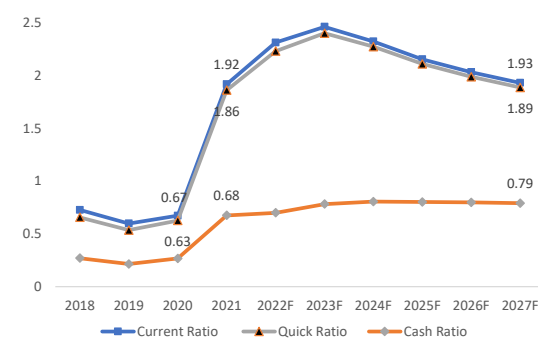
The operational efficiency of Hapag-Lloyd was jeopardized due to lower payables days as a result of the record financial results, showing a cash conversion of 34.6 days. This situation is expected to be revised with the sales decreasing, leading a **cash conversion of 13 days** in 2027.

Figure 56. Profitability ratio evolution



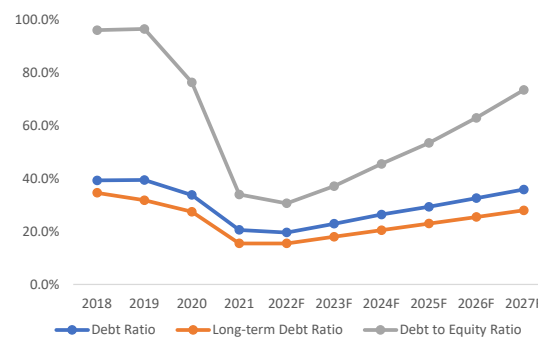
Source: Author Analysis

Figure 57. Liquidity ratio evolution



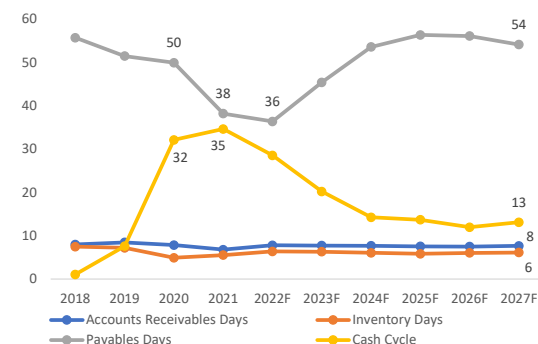
Source: Author Analysis

Figure 58. Solvency ratio evolution



Source: Author Analysis

Figure 59. Efficiency ratio evolution



Source: Author Analysis

## 8. Investment Risks

The international container shipping industry seems to be less risky in the last 2 years considering the impact of COVID-19. However, Hapag Lloyd still faces a lot of risks. For operational risks, there are vessel incidents, cyber-attacks, and fluctuation in charter rates. Company faces market risks as interest rates, USD/EUR exchange rate and fluctuation in freight rates and transport volume that influences revenue, bunk consumption price effects cost. For political risks, there are political instability, trade war and legal disputes and for regulatory risk, the main comes from environmental regulations (Figure 60 and Table 9).

### Operational Risk

#### Vessel incidents (OR1)

The risk from operation of vessels associates specific risks, including accidents, collisions, damage to the environment, loss of a vessel, damaged or lost to cargo, loss of vessel certification, and even delays caused by strikes by crews or dock workers. All the above could restrict vessels from functioning, slow shipment progress, as well as the damage or loss of property (Figure 61). This might harm the company's reputation and affect client relationships.

Hapag-Lloyd has established economically appropriate insurance plans to mitigate these risks to the best of its ability. However, it is not impossible that existing insurance plans do not fully cover all sorts of damage. This might have a severe negative impact on the revenue of the company.

#### Cyber Attack (OR2)

The accessibility to IT systems allows the company for continuous data processing, ensuring effective control of corporate operations and expenses. A breakdown of an IT system, for example, owing to cyberattacks, might hamper company activities and cause higher expenses due to business disruptions. IT systems are protected in a variety of methods to mitigate these dangers. As shown in Figure 62, the global spending on cybersecurity in 2021 is forecasted to be around \$60bn.

Hapag-Lloyd has an appropriate management system for information security in place to respond to information security issues. As the impact from cyberattack to revenue is unanticipated, the risk seems to be manageable and has medium possible to happen.

#### Chart rate (OR3)

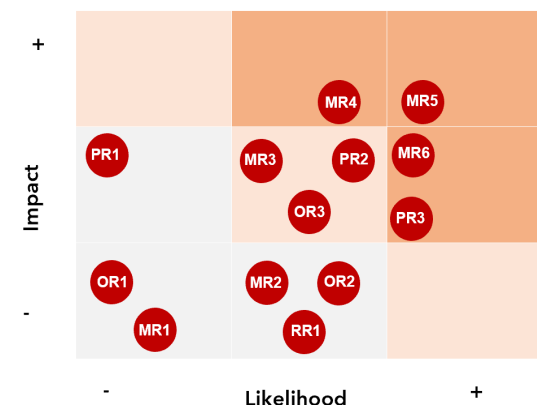
Charter prices follow the trend in freight rates with a time lag of many months, if the freight rates drop, Hapag-Lloyd may be unable to lower its portfolio of chartered vessels with above-average charter rates in compared to the spot market for several months. It is not impossible to predict that charter prices won't climb further in the future, despite currently being at a reasonably high level, and the increasing cost will not be passed on to consumers in the form of higher freight charges.

### Market Risk

#### Interest rate (MR1)

In an open economy, the impact of interest rate on the access to funding is more important than in the past. When a country tightens, the interest rate will rise, and the interest rate difference will be formed in the international market, which will cause short-term funds to move internationally. If the interest rate of a country is

Figure 60. Risk Matrix



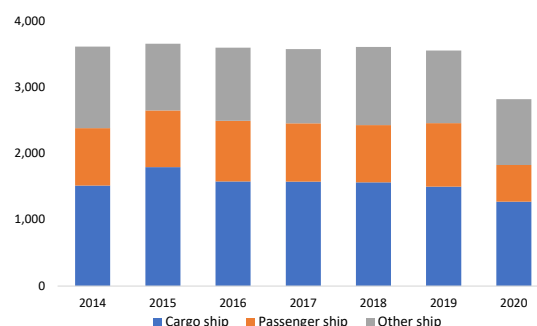
Source: Author Analysis

Table 9. Investment Risks

OR1	Operational Risks	Vessel incidents
OR2		Cyber attack
OR3		Charter rates
MR1	Market Risks	Interest rates
MR2		Capacity bottlenecks at port
MR3		USD/EUR exchange rate
MR4		Decrease in freight rates
MR5		Decrease in transport volume
MR6		Bunk consumption price
PR1	Political Risks	Political instability
PR2		Russia Ukraine Conflicts
PR3		Legal disputes
RR1	Regulatory Risks	Environmental regulations

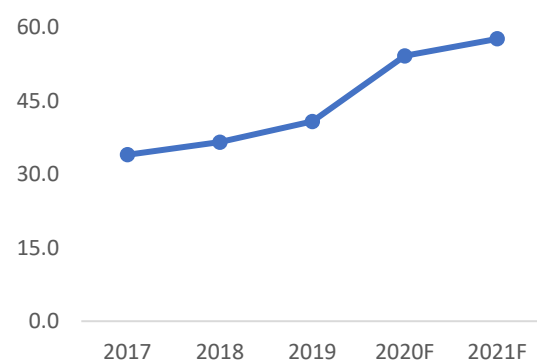
Source: Author Analysis

Figure 61. Maritime incidents in the EU by type



Source: Statista, Author Analysis

Figure 62. Global cybersecurity spending (\$bn)



Source: Statista, Author Analysis

higher than that of other countries, it will attract a large number of capital inflows, reduce the outflow of domestic funds, and at the same time, the capital account balance will be improved. As shown in Figure 63, the interest rate in Germany has been negative since 2019. This also leads the fluctuation of the risk free rate when calculating the discount rate applied in the valuation.

### Capacity bottlenecks at ports (MR2)

The activity of shipping companies is dependent on the capacity of ports. Lower port capacity may result in supply constraints. As mentioned in the industry analysis, the capacities of container shipping have been experiencing an explosive increase in last few years, which is faster than the amount of available berths at ports. If transport and container capacity were raised further, the time lost at the impacted ports may be substantially higher. Furthermore, trade flow imbalances may result in local bottlenecks in availability of vessel and container capacity. Waiting times at ports may become longer with temporary closures of container terminals and a shortage of labour due to pandemic, resulting in a significant amount of wasted time during vessel loading and unloading. This will lead to increasing storage costs, and higher tariffs for services as well.

### USD/ EUR exchange rate (MR3)

The functional currency of Hapag-Lloyd is US dollar in which the majority of services are typically billed, that includes bunker cost, freight and charter rates, and container and vessel financing. Meanwhile, the reporting currency for the company is the euro. As a result, the company is sensitive to exchange rate movements. Thus, fluctuations in the USD/EUR exchange rate (Figure 64) have a significant influence on the major financial metrics provided in the annual and quarterly financial statements.

Once the US dollar appreciates compared to euro, the cost of transportation becomes higher which will jeopardize the profit margin and the demand for shipping is reduced so that will have a negative impact for the revenue.

### Decrease in freight rates (MR4)

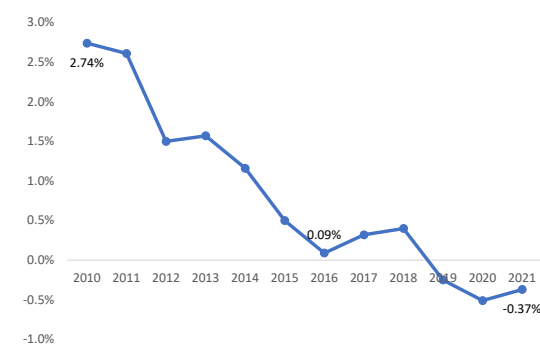
As one of the most important profitability driver for Hapag-Lloyd, the development of freight rates has a significant impact on the revenue, which is largely dependent on the transport capacities supply and the demand of global trades. The participation of Hapag-Lloyd in Alliance enables it to provide a complete network of liner services on significant trades with regular arrivals and departures, that would not be achievable through its own fleet. This implies the company is better positioned to capitalize on possibilities created by changes in transport volumes and vessel capacity.

However, as of now, the freight rate is at an exceptionally high point which is expected to be fall down in the long run. Even though the company has long-term contracts with its clients to lock the freight rates, the decrease in freight rates has a massive negative influence on the financials and has high possibility to happen in the forecast period.

### Decrease in transport volume (MR5)

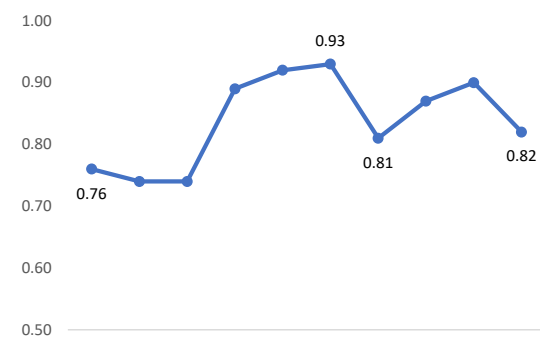
Transport volume is another significant profitability drive of Hapag-Lloyd as mentioned before, which is heavily dependent on the world trade and the availability container ship capacity also is limited by the container port throughput, which is hard to anticipate. With the foreseeable rise in transport capacities due to delivery of new vessels and the potential new joiner, the price competition may become more intense.

Figure 63. Long-term interest rates in Germany



Source: Statista, Author Analysis

Figure 64. USD/EUR exchange rate



Source: Statista, Author Analysis

Hapag-Lloyd is always working on the improvement of its IT-based prediction models in order to minimize empty legs and reduce the expenses associated. Nevertheless, if the transport volumes fail to make the projected contribution to earnings, it may have a negative impact on its financials.

### Bunker consumption price (MR6)

For Maritime shipping, the price of bunker fuel has always been an unavoidable cost. As shown in Figure 65, the bunker price is quite volatile in last decade. For the company, although hedging is used to reduce costs, and partial increase could be passed to its customer through the bunker surcharge it is still beyond its budget control. As a result, the volatility of fuel costs poses a risk to the company's bottom line. Consumption levels may even increase due to high levels of port congestion.

## Political Risk

### Political instability (PR1)

The main role of shipping is to link exporting economies with importing economies, which is undoubtedly the foundation for economic globalization. However, with the prominence of geopolitics, the conflict between countries has intensified, so political instability will reduce the demand for Maritime shipping in various countries and hinder the flow of goods. For example, Hapag-Lloyd is one of three international container liner shipping companies that provide container transport services for the governmental organisations of the USA (US flag business). If Hapag-Lloyd no longer satisfies the conditions for this, it could have a negative impact on its earnings position.

### Russia Ukraine Conflicts (PR2)

Ukraine's war caused a severe impact in the recovery pace for the global economies from pandemic and higher pressure on inflation. Sanctions have been taken against Russia, for example, seven Russian banks have been excluded from the SWIFT system, European airspaces are closed off to all Russian flights and Germany suspended certification of the Nord Stream 2 gas pipeline. As shown in Appendix 40, Ukraine and Russia are both important producers of commodities such as wheat, oil, and metals, the conflict lead the rise in commodities price. This conflicts also increased political and economic uncertainty, accelerated economic deglobalization, and lowered the level of international trade.

### Legal disputes (PR2)

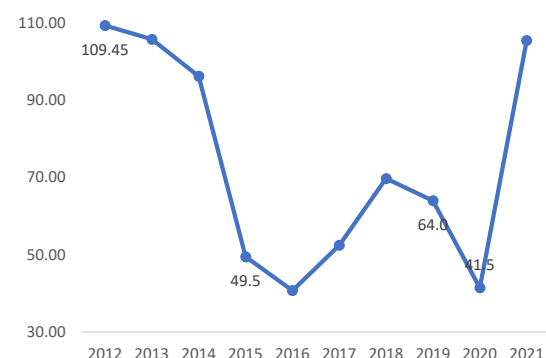
Hapag-Lloyd is now involved in litigation involving international tax authorities, claims asserted by former workers, and contractual connections with suppliers, former agents, and consumers. Although the company may be successful in those legal disputes, it can result in increased costs, a negative impact on earnings, and harm the Company's reputation even with low possibility.

## Regulatory Risk

### Environmental risk (PR1)

The maritime industry has invested in climate and environmental protection in recent years and will intensify such activities in the future. To ensure that the instruments are as standardized and effective as possible, the International Maritime Organization (IMO) and supranational bodies are expected to tighten existing regulations and develop further measures. As a result, further regulations may be enforced in the future, which may require significant additional capital expenditure or the scrapping of existing ships.

Figure 65. Average annual OPEC crude oil price



Source: Statista, Author Analysis

## Price Target Sensitivity

To analyse the potential impact of each risk factor on the valuation of Hapag-Lloyd, several sensitivity analysis are conducted to demonstrate the resilience of the recommendation (Figure 66). The main factors that have been taken into consideration include: the terminal growth rate and Perpetuity WACC which effect the terminal value of the company, beta and risk free rate which determine the discount rate during the forecast period, real growth rate of transport volume and freight rate which influence the revenue, average USD/EUR exchange rate and crude oil price growth rate that have a direct impact on the cost.

### Perpetuity WACC and Terminal Growth Rate

As shown in Table 10, the base case for Perpetuity WACC and Terminal Growth Rate implies 2.25% as Terminal Growth Rate and 8.77% as Perpetuity WACC. In the **worst case scenario** – 1.45% as Terminal Growth Rate and 10.27% as Perpetuity WACC, the price target of Hapag-Lloyd is equal to **€172.59**. In the **best case scenario** – 3.05% as Terminal Growth Rate and 7.57% as Perpetuity WACC, the price target of Hapag-Lloyd is equal to **€267.88** (Table 11).

Figure 66. Recommendation (High Risk)

<b>SELL</b>	≤ 0%
<b>REDUCE</b>	> 0% & ≤ 10%
<b>HOLD</b>	> 10% & ≤ 20%
<b>BUY</b>	> 20% & ≤ 45%
<b>STRONG BUY</b>	< 45%

Source: Author Analysis

Table 10. WACC and Terminal Growth Rate

Growth Rate and WACC	
<b>Base Case Assumptions</b>	
Terminal Growth Rate	2.25%
Perpetuity WACC	8.77%
Target price	207.84
<b>Worst Case Scenario</b>	
Terminal Growth Rate	1.45%
Perpetuity WACC	10.27%
Target price	172.59
<b>Best Case Scenario</b>	
Terminal Growth Rate	3.05%
Perpetuity WACC	7.57%
Target price	267.88

Source: Author Estimation

Table 11. Perpetuity WACC and Terminal Growth Rate Sensitivity Analysis

Perpetuity WACC	Terminal Growth Rate									
	207.84	1.45%	1.65%	1.85%	2.05%	2.25%	2.45%	2.65%	2.85%	3.05%
7.57%	215.39	220.40	225.76	231.51	237.69	244.35	251.55	259.37	267.88	
7.87%	208.85	213.41	218.27	223.47	229.03	235.01	241.44	248.38	255.91	
8.17%	202.90	207.07	211.50	216.21	221.25	226.64	232.42	238.64	245.34	
8.47%	197.46	201.28	205.34	209.64	214.22	219.11	224.34	229.93	235.94	
8.77%	192.47	195.99	199.71	203.66	207.84	212.30	217.04	222.11	227.53	
9.07%	187.86	191.12	194.55	198.18	202.03	206.10	210.43	215.04	219.95	
9.37%	183.61	186.63	189.81	193.16	196.70	200.44	204.41	208.62	213.10	
9.67%	179.67	182.47	185.42	188.53	191.80	195.25	198.90	202.77	206.86	
9.97%	176.00	178.62	181.36	184.25	187.28	190.48	193.85	197.41	201.17	
10.27%	172.59	175.03	177.60	180.28	183.10	186.07	189.19	192.48	195.95	

Source: Author Estimation

### Beta in the terminal year and Risk free rate

As shown in Table 12, the base case for Beta in the terminal year and risk free rate implies 1.51 as Beta in the terminal year and 2.3% as Risk free rate. In the **worst case scenario** – 1.95 as Beta in the terminal year and 3.05% as risk free rate, the price target of Hapag-Lloyd is equal to **€175.94**. In the **best case scenario** – 1.07 as Beta in the terminal year and 1.7 % as Risk free rate, the price target of Hapag-Lloyd is equal to **€261.74** (Table 13).

Table 12. Beta and Risk free rate

Beta and Risk free rate	
<b>Base Case Assumptions</b>	
Beta in terminal year	1.51
Risk free rate	2.30%
Target price	207.84
<b>Worst Case Scenario</b>	
Beta in terminal year	1.95
Risk free rate	3.05%
Target price	175.94
<b>Best Case Scenario</b>	
Beta in terminal year	1.07
Risk free rate	1.70%
Target price	261.74

Source: Author Estimation

**Table 13.** Beta in the terminal year and Risk free rate Sensitivity Analysis

Risk free rate	Beta in terminal year									
	207.84	1.07	1.18	1.29	1.40	1.51	1.62	1.73	1.84	1.95
	1.70%	261.74	248.25	236.59	226.40	217.43	209.47	202.35	195.96	190.18
	1.85%	257.69	244.71	233.46	223.62	214.93	207.21	200.30	194.08	188.45
	2.00%	253.78	241.29	230.44	220.92	212.50	205.01	198.30	192.24	186.76
	2.15%	250.02	237.98	227.51	218.30	210.14	202.87	196.34	190.45	185.11
	2.30%	246.38	234.78	224.66	215.75	207.84	200.78	194.44	188.70	183.50
	2.45%	242.87	231.69	221.90	213.27	205.61	198.75	192.58	186.99	181.92
	2.60%	239.47	228.68	219.23	210.87	203.43	196.76	190.76	185.32	180.37
	2.75%	236.19	225.77	216.62	208.53	201.31	194.83	188.99	183.69	178.86
2.90%	233.01	222.95	214.10	206.25	199.24	192.94	187.25	182.09	177.38	
3.05%	229.94	220.21	211.64	204.03	197.22	191.10	185.56	180.53	175.94	

Source: Author Estimation

### Revenue assumptions

As shown in Table 14, the base case for real growth rate of freight rate and transport volume implies 0.0% as real growth rate of transport volume and 0.0% as real growth rate of freight rate. In the **worst case scenario** – -4.0% as real growth rate of transport volume and -2.0% as real growth rate of freight rate, the price target of Hapag-Lloyd is equal to **€170.85**. In the **best case scenario** – 4.0% as real growth rate of transport volume and 2.5% as real growth rate of freight rate, the price target of Hapag-Lloyd is equal to **€262.67** (Table 15).

**Table 14.** Revenue assumptions

Revenue	
<b>Base Case Assumptions</b>	
Growth rate of Transport Volume	0.00%
Real growth rate of Freight Rate	0.00%
Target price	207.84
<b>Worst Case Scenario</b>	
Growth rate of Transport Volume	-4.00%
Real growth rate of Freight Rate	-2.00%
Target price	170.85
<b>Best Case Scenario</b>	
Growth rate of Transport Volume	4.00%
Real growth rate of Freight Rate	2.50%
Target price	262.67

Source: Author Estimation

**Table 15.** Revenue assumptions Sensitivity Analysis

Real growth rate of Freight Rate	Growth rate of Transport Volume									
	207.84	-4.00%	-3.00%	-2.00%	-1.00%	0.00%	1.00%	2.00%	3.00%	4.00%
	-2.00%	170.85	176.92	183.36	190.21	197.50	205.27	213.58	222.48	232.03
	-1.50%	172.89	179.08	185.64	192.62	200.06	207.99	216.46	225.55	235.30
	-1.00%	174.95	181.25	187.94	195.05	202.63	210.72	219.37	228.65	238.61
	-0.50%	177.02	183.44	190.25	197.50	205.23	213.48	222.31	231.77	241.95
	0.00%	179.11	185.64	192.58	199.97	207.84	216.26	225.26	234.93	245.32
	0.50%	181.20	187.86	194.93	202.45	210.48	219.06	228.25	238.11	248.72
	1.00%	183.31	190.09	197.29	204.96	213.14	221.88	231.26	241.32	252.16
	1.50%	185.44	192.33	199.67	207.48	215.81	224.73	234.29	244.56	255.63
2.00%	187.58	194.60	202.06	210.02	218.51	227.60	237.35	247.83	259.13	
2.50%	189.73	196.87	204.47	212.58	221.23	230.50	240.44	251.13	262.67	

Source: Author Estimation

### Cost assumptions

As shown in Table 16, the base case for crude oil price growth rate and average USD/EUR exchange rate implies 56.62% as Crude oil price growth rate and 0.93 as average USD/EUR exchange rate. In the **worst case scenario** – 76.62% as Crude oil price growth rate and 0.87 as Average USD/EUR exchange rate, the price target of Hapag-Lloyd is equal to **€163.81**. In the **best case scenario** – 36.62% as Crude oil price growth rate and 1.01 as average USD/EUR exchange rate, the price target of Hapag-Lloyd is equal to **€267.70** (Table 17).

**Table 16.** Cost assumptions

Cost	
<b>Base Case Assumptions</b>	
Crude oil price growth rate	56.62%
Average USD/EUR exchange rate	0.93
Target price	207.84
<b>Worst Case Scenario</b>	
Crude oil price growth rate	76.62%
Average USD/EUR exchange rate	0.87
Target price	163.81
<b>Best Case Scenario</b>	
Crude oil price growth rate	36.62%
Average USD/EUR exchange rate	1.01
Target price	267.70

Source: Author Estimation

**Table 17.** Cost assumptions Sensitivity Analysis

Average USD/EUR exchange rate	Crude oil price growth rate									
	207.84	36.62%	41.62%	46.62%	51.62%	56.62%	61.62%	66.62%	71.62%	76.62%
0.868	211.90	205.85	199.80	193.77	187.75	181.74	175.75	169.77	163.81	
0.884	217.51	211.26	205.02	198.80	192.59	186.40	180.22	174.05	167.91	
0.900	223.25	216.80	210.37	203.95	197.55	191.16	184.79	178.44	172.10	
0.916	229.13	222.48	215.85	209.23	202.63	196.05	189.48	182.93	176.40	
0.932	235.16	228.31	221.47	214.65	207.84	201.06	194.29	187.53	180.80	
0.948	241.34	234.28	227.23	220.20	213.19	206.19	199.21	192.25	185.31	
0.964	247.68	240.40	233.14	225.89	218.66	211.45	204.26	197.09	189.94	
0.980	254.19	246.68	239.20	231.73	224.28	216.85	209.44	202.05	194.68	
0.996	260.86	253.13	245.41	237.72	230.04	222.39	214.75	207.14	199.55	
1.012	267.70	259.74	251.79	243.86	235.96	228.07	220.21	212.36	204.55	

Source: Author Estimation

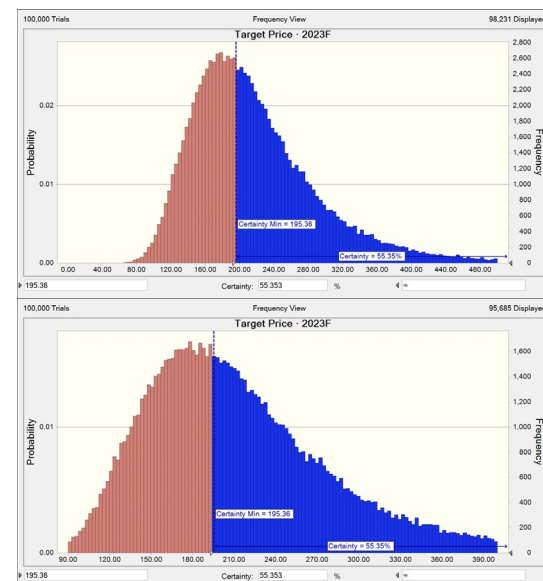
### Monte Carlo Simulation

A complementary analysis on PT sensitivity, a Monte Carlo Simulation with 100,000 simulations was computed, considering the simultaneous changes in the following key value drivers: i) Perpetuity WACC, ii) terminal Growth Rate, iii) real growth rate of freight rate, iv) real growth rate of transport volume, v) growth rate of crude oil price and vi) average USD/EUR exchange rate.

The result of the Monte Carlo simulation indicated a **median for the price target of €204.02**, near the Hapag-Lloyd price target of €207.84, which is in line with the **Hold** recommendation.

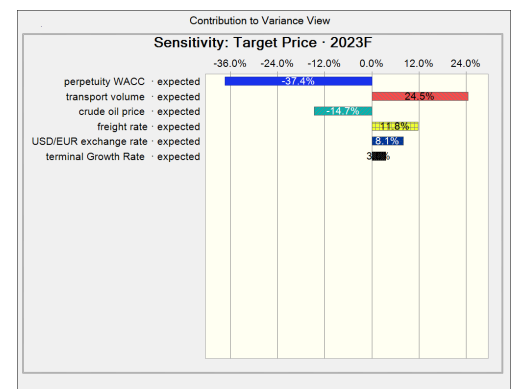
In additional, the results confirm that the most important drivers of the valuation are the **perpetuity WACC** and the growth rate of **transport volume** in the first year, with a proportion of **-37.4%** and **24.5%** respectively.

**Figure 67.** Monte Carlo Simulation



Source: Author Estimation

**Figure 68.** Price target sensitivity



Source: Author Estimation



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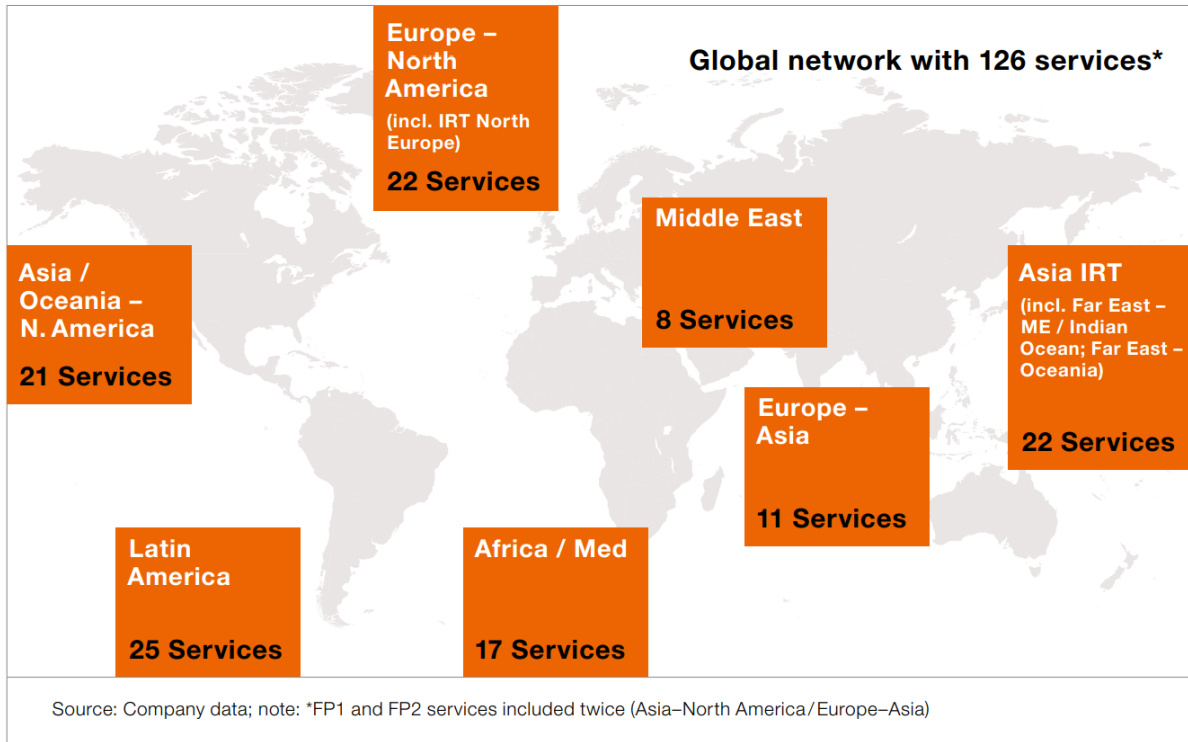
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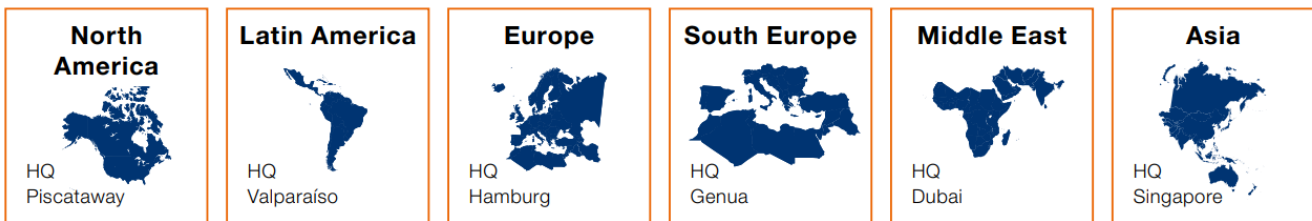
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# Appendices

## Appendix 1: Network of Hapag-Lloyd services



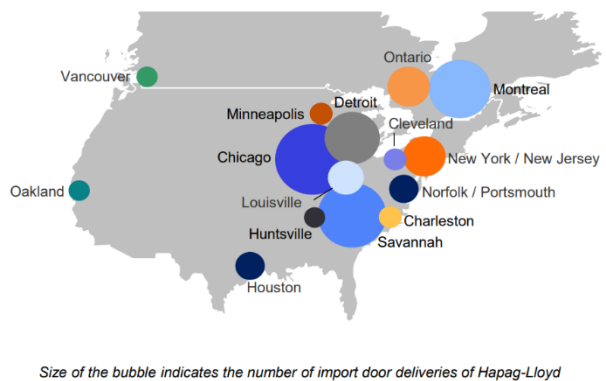
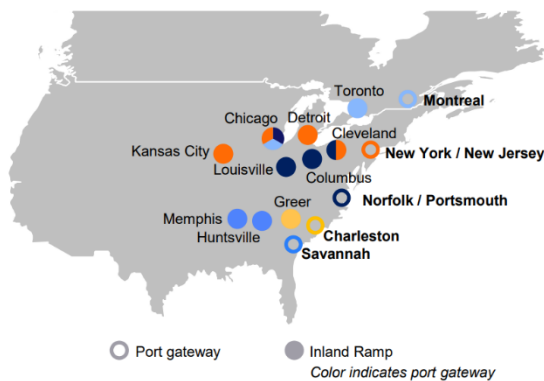
## Appendix 2: Hapag-Lloyd business region



## Appendix 3: Hapag-Lloyd's intermodal connections

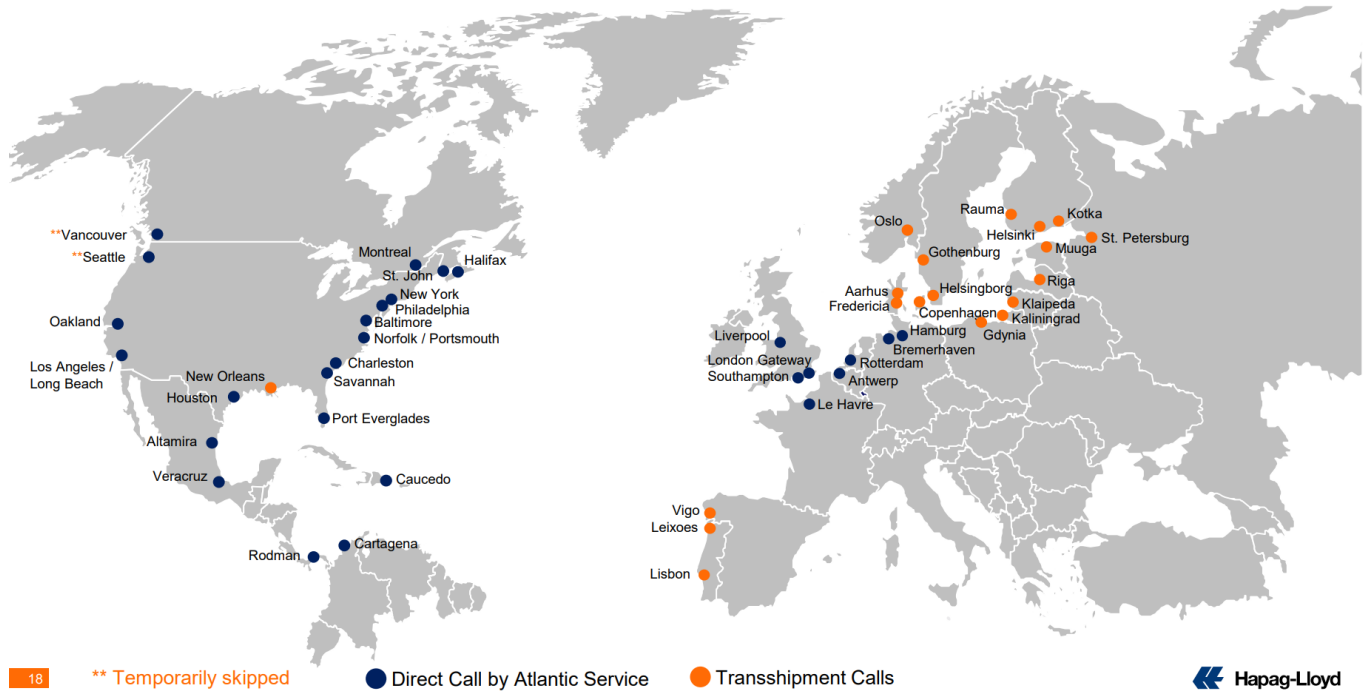
**85 trains** per week between the 10 biggest port-ramp combinations in the Atlantic Trade

**200,000 truck** loads per year from/to the 15 biggest door locations in the Atlantic Trade

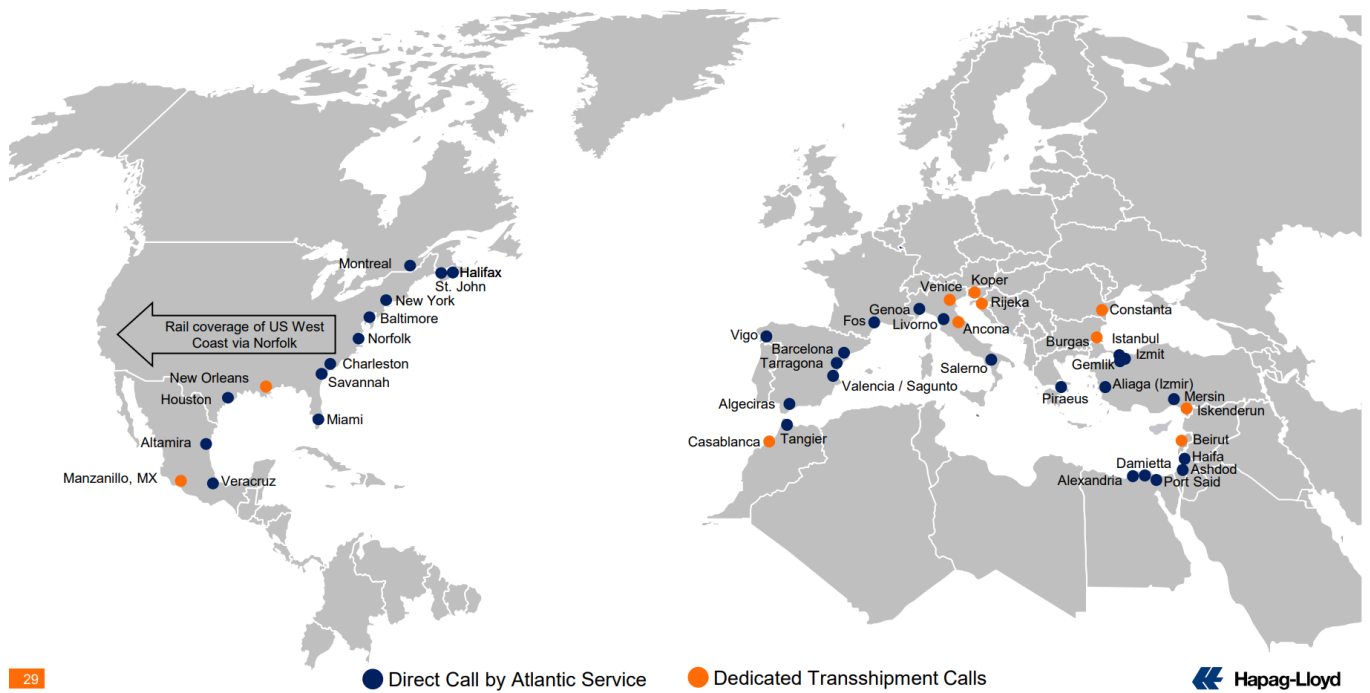


## Appendix 4: Ports coverage of Hapag-Lloyd

### North Europe & North America Ports of Call

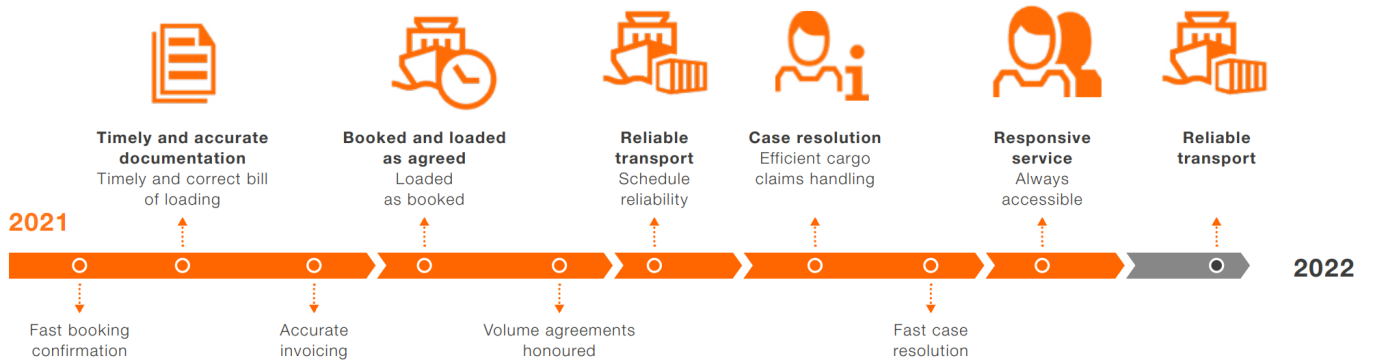


### North America & Mediterranean Ports of Call



Source: Hapag-Lloyd business presentation

## Appendix 5: Quality promises



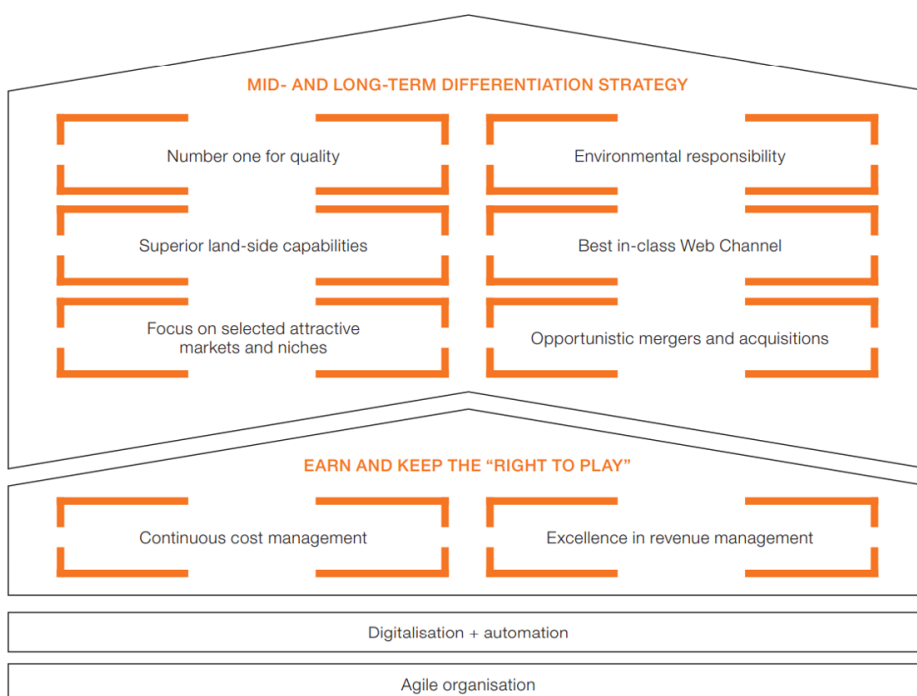
Source: Hapag-Lloyd business presentation

## Appendix 6: Potential measures of reduction of emissions



Source: Hapag-Lloyd Sustainability Report 2021

## Appendix 7: Long-term strategy



Source: Hapag-Lloyd Annual Report 2021

## Appendix 8: Members of the Supervisory Board

### **Michael Behrendt**

(Chairman of the Supervisory Board)

### **Klaus Schroeter**

Departments of Transport and Special Services, ver.di – Vereinte Dienstleistungsgewerkschaft (service workers' union), Berlin (First Deputy Chairman of the Supervisory Board)

### **Oscar Eduardo Hasbún Martínez**

Chief Executive Officer  
Compañía Sud Americana de Vapores S.A.,  
Santiago de Chile, Chile  
(Second Deputy Chairman of the Supervisory Board)

### **Felix Albrecht**

Chairman of the Marine Works Council  
Hapag-Lloyd AG, Hamburg

### **Turqi Alnowaiser**

Deputy Governor and Head of International Investments  
Public Investment Fund, Riyadh, Kingdom of Saudi Arabia

### **H. E. Sheikh Ali bin Jassim Al-Thani**

Advisor to the CEO  
Qatar Investment Authority, Qatar

### **Nicola Gehrt**

Director  
Head of Group Investor Relations  
TUI Group, Hanover

### **Karl Gernandt**

Executive Chairman  
Kühne Holding AG, Schindellegi, Switzerland

### **Annabell Kröger**

Commercial Clerk  
Hapag-Lloyd AG, Hamburg

### **Arnold Lipinski**

Senior Director Fleet Management  
Hapag-Lloyd AG, Hamburg

### **Sabine Nieswand**

Chairwoman of the Works Council  
Hapag-Lloyd AG, Hamburg

### **Dr Isabella Niklas**

Spokeswoman of the Management, HGV  
Hamburger Gesellschaft für Vermögens- und Beteiligungsmanagement mbH, Hamburg

### **José Francisco Pérez Mackenna**

Chief Executive Officer  
Quiñenco S.A., Santiago de Chile, Chile

### **Maya Schwiegershausen-Güth**

Head of Federal Expert Group Maritime Economy, ver.di Bundesverwaltung, Berlin

### **Svea Stawars**

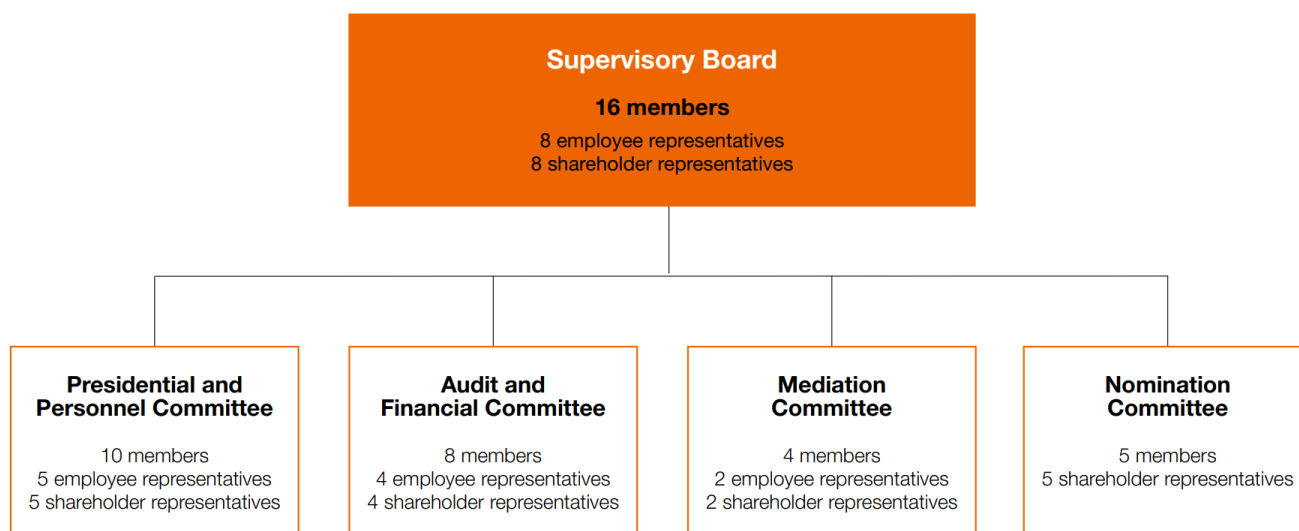
Commercial Clerk  
Hapag-Lloyd AG, Hamburg

### **Uwe Zimmermann**

Commercial Clerk  
Hapag-Lloyd AG, Düsseldorf

Source: Hapag-Lloyd Annual Report 2021

## Appendix 9: Supervisory Board and committee



Source: Hapag-Lloyd Annual Report 2021

## Appendix 10: Main regularly provided components of the Executive Board remuneration

Fixed Remuneration	<b>Fixed Annual Salary</b>	<ul style="list-style-type: none"> <li>Fixed remuneration that is paid in twelve equal monthly installments</li> </ul>
	<b>Fringe Benefits</b>	<ul style="list-style-type: none"> <li>Benefits in kind, such as company car, use of driving service, benefits for insurance coverage (e.g. accident insurance)</li> </ul>
	<b>Pension Benefits</b>	<ul style="list-style-type: none"> <li>Annual one-off payment equal to 20% of the individual fixed annual remuneration</li> </ul>
Variable Remuneration	<b>Short-Term Variable Remuneration</b>	<ul style="list-style-type: none"> <li>Individually defined percentage of annual Group EBIT</li> <li>Caps (values relevant on first-time application of the remuneration system):               <ul style="list-style-type: none"> <li>CEO – EUR 900,000</li> <li>CFO – EUR 660,000</li> <li>Ordinary Executive Board member – 600.000 EUR</li> </ul> </li> <li>Settlement in cash after the end of a financial year</li> </ul>
	<b>Long-Term Variable Remuneration</b>	<ul style="list-style-type: none"> <li>Multi-year bonus divided into three parts with a three-year term/performance period</li> <li>Grant amount (values relevant on first-time application of the remuneration system):               <ul style="list-style-type: none"> <li>CEO – EUR 1,000,000</li> <li>CFO – EUR 700,000</li> <li>Ordinary Executive Board member – 650.000 EUR</li> </ul> </li> <li>Allocation of the grant amount as follows:               <ul style="list-style-type: none"> <li>40% performance component (taking into account EBITDA, ROIC and EAT)</li> <li>40% retention component (taking into account EBITDA)</li> <li>20% ESG component (taking into account Average Efficiency Ratio – AER)</li> </ul> </li> <li>Cap at 150% of the grant amount</li> <li>Settlement in cash after the end of the term</li> </ul>

Source: Hapag-Lloyd Remuneration Report 2021

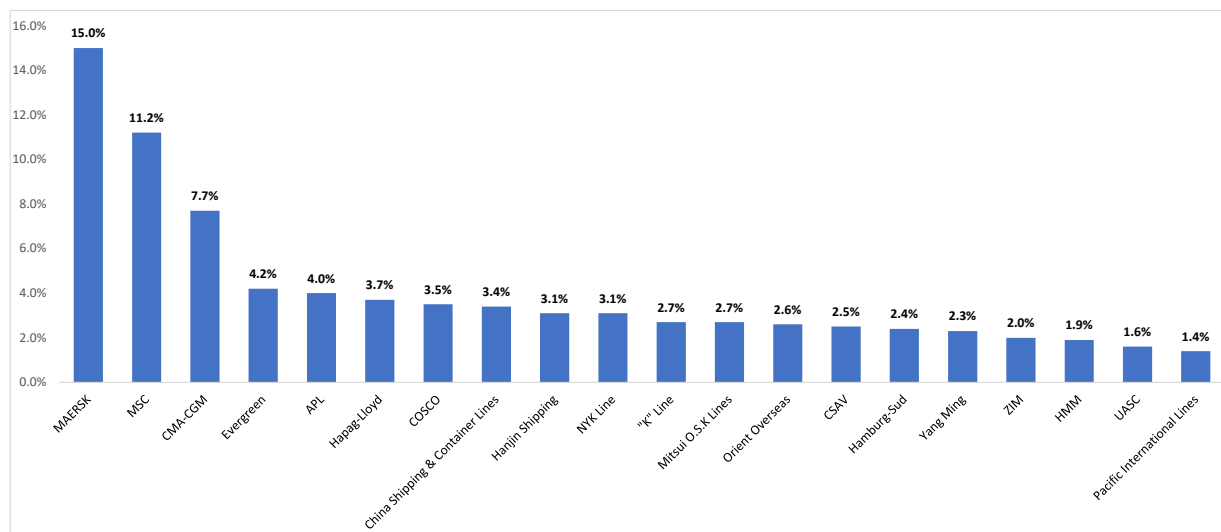
## Appendix 11: The eight focus topics of the sustainability strategy



Source: Hapag-Lloyd Sustainability Report 2021

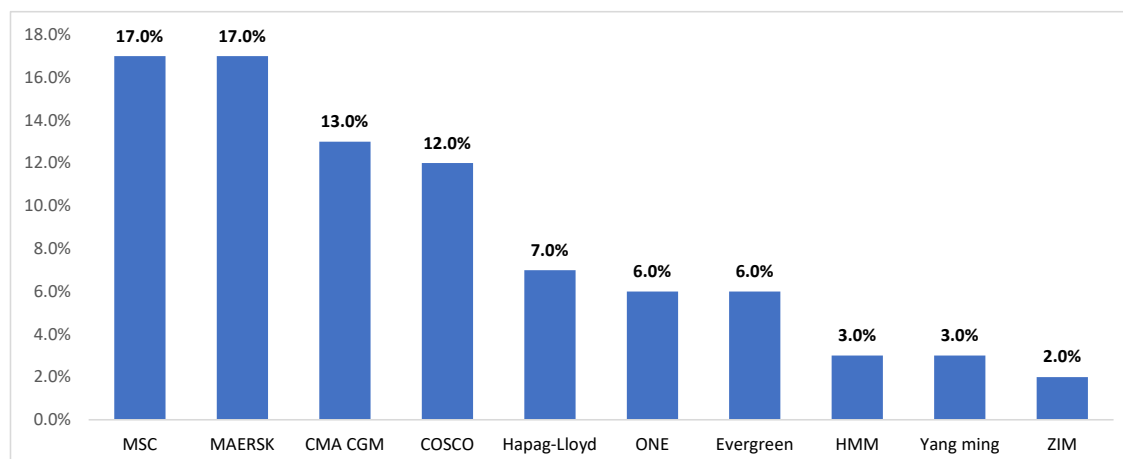
## Appendix 12: Market share of the top container liner shipping companies

### Market share by company in 2010 (81% of the market)



Source: Transport Intelligence, author analysis

### Market share by company in 2022 (86% of the market)



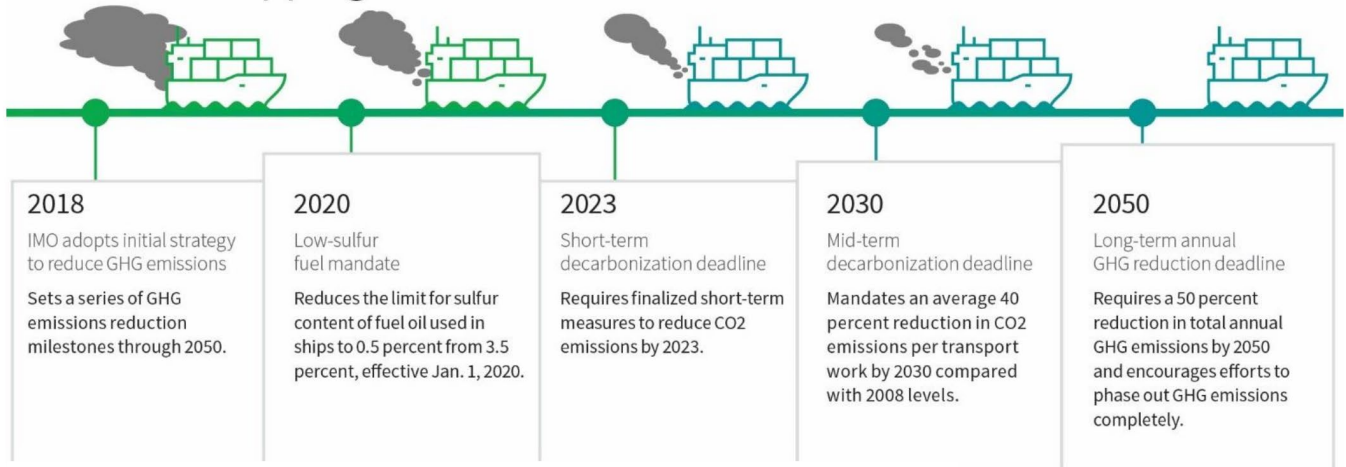
Source: Transport Intelligence, author analysis



## Appendix 13: IMO Strategy to Reduce GHG Emissions

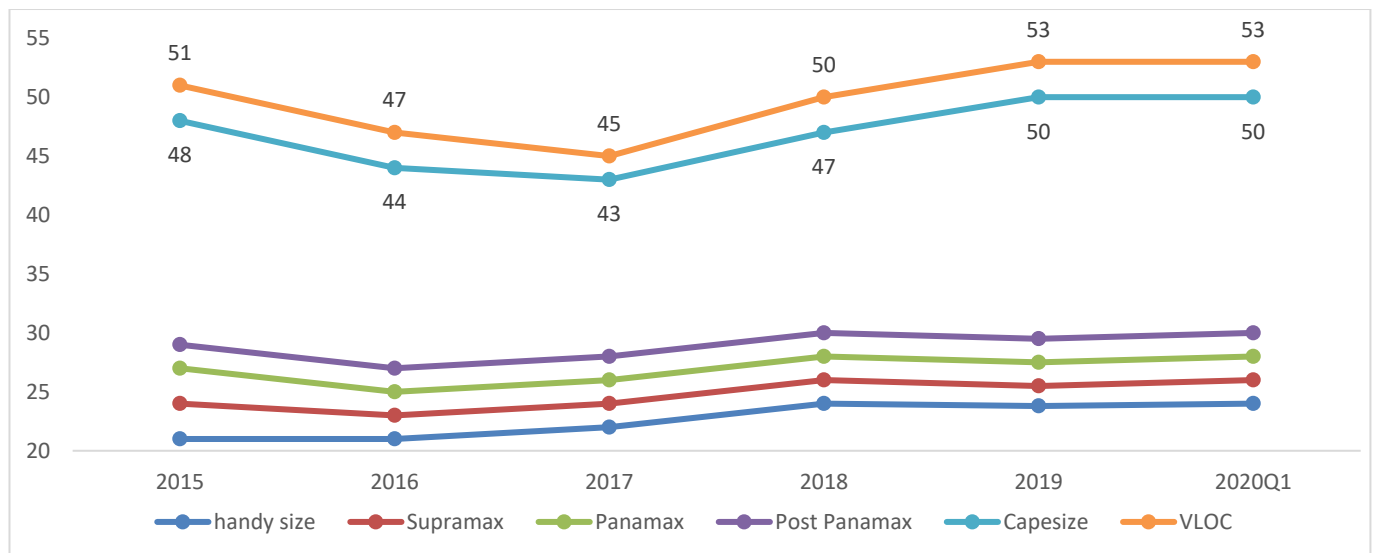
### Sailing toward zero-emission container shipping

The International Maritime Organization (IMO) has introduced rules aimed at reducing harmful sulfur oxide (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), and other greenhouse gas (GHG) emissions from ships.



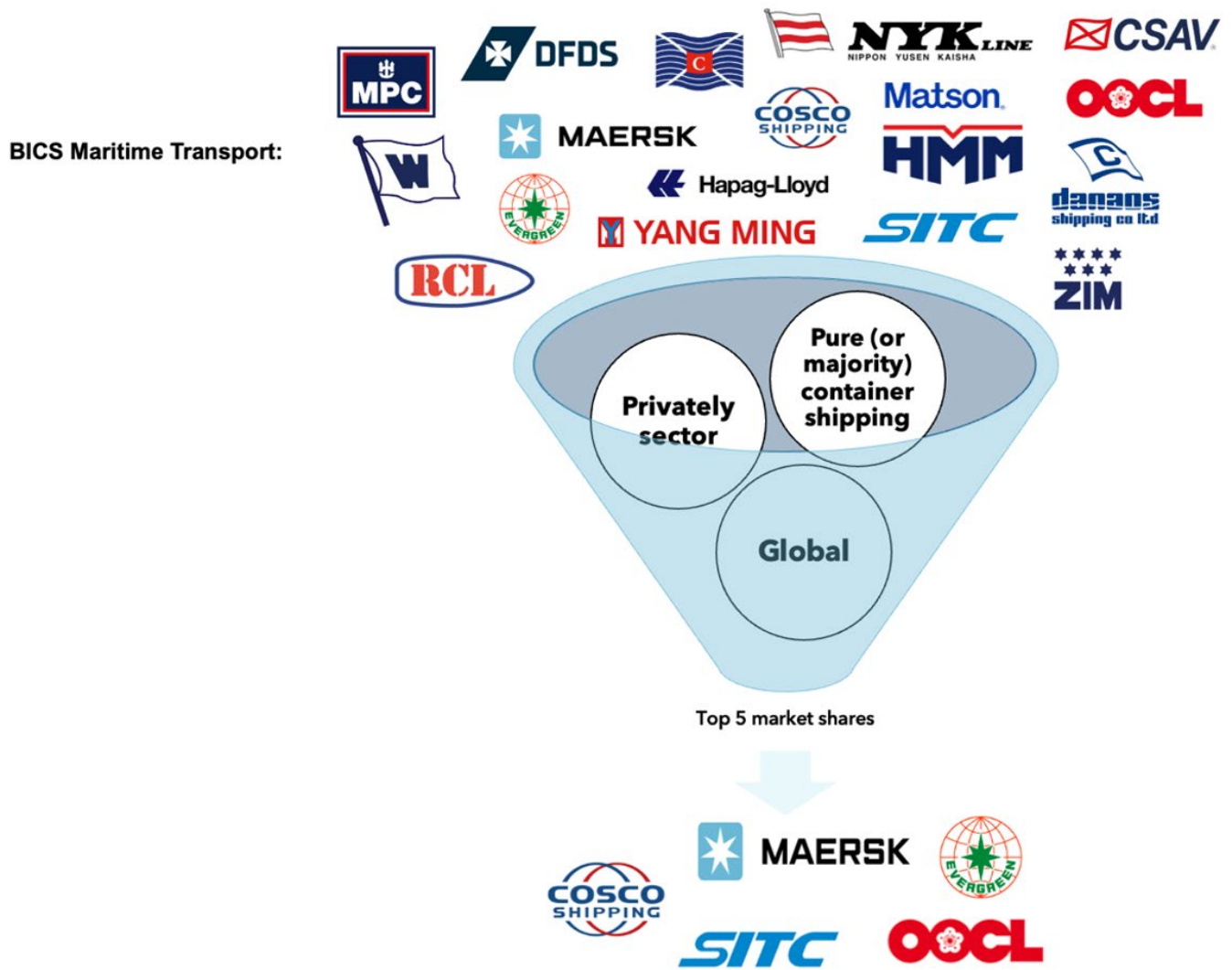
Source: Hapag-Lloyd Sustainability Report 2021

## Appendix 14: Newbuilding prices by vessel types (\$ Million)



Source: UNCTADstat, Author Analysis

## Appendix 15: Peer Selection



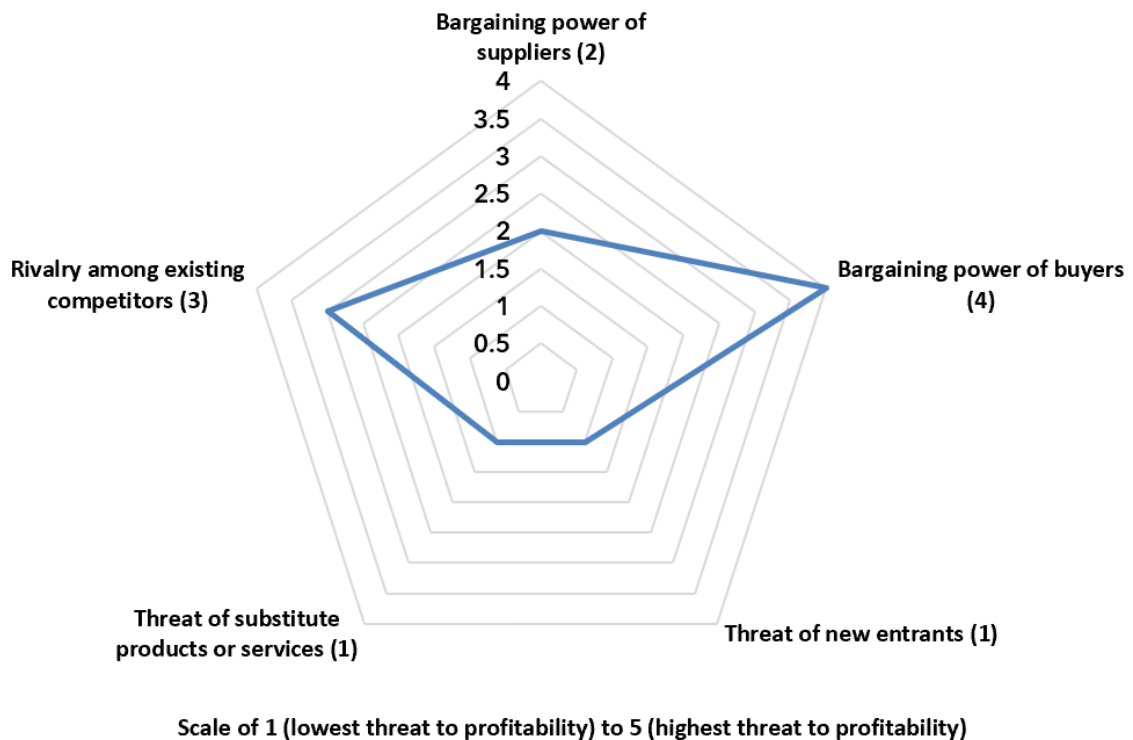
Source: Infographic, Author Analysis

## Appendix 16: Industry strategies

Companies	Strategies
MAERSK	Create a portfolio of end-to-end products and services; Seamless customer engagement; Superior delivery network end-to-end
MSC	Enable sustainable supply chains; Retain their long term partnerships with customers.
CMA-CGM	Pursue maritime development; Offer logistics solutions; Accelerate innovation and digitalization; Offer sustain ability solutions.
COSCO	Optimize globalization; Implement dual brand to continuously improve the quality of their shipping services.
Hapag-Lloyd	Improve quality; Invest in digitalization; Improve land-side capabilities.
One	Improve sustain ability; Improve quality; Invest in digitalization; Offer digital solutions.
Evergreen Line	Enhance joint cooperations; Improve service quality; Optimize feet configuration; Increase participation in initiatives to facilitate industrial upgrading.
Hyundai Merchant Marine	Strengthen capacity to respond to climate change; Strengthen R&D capabilities; Manage supply chains; Expand investment in environmental protection
Yang Ming Marine Transport	Ship replacement and renewal plans to continuously improve service quality; Expand to new markets as a way to improve their service network
ZIM Integrated Shipping	Provide innovative and customer-centred services; Implement data-dryen strategies promoting digitization and creative solutions to the market

Source: Author Analysis

## Appendix 17: Porter's 5 Forces



Source: Author Analysis



## Appendix 19: Income Statement



Annual Standardised in Millions of Euros

Income Statement	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F
<b>Revenue</b>	9,973.4	11,617.5	12,607.9	12,772.4	22,273.5	25,788.8	21,485.7	19,709.7	18,944.6	18,686.7	19,299.5
Transport expenses	(7,990.0)	(9,586.4)	(9,707.0)	(9,140.2)	(10,323.3)	(13,110.8)	(13,743.6)	(14,659.8)	(14,570.4)	(14,161.2)	(14,423.7)
Personnel expenses	(679.8)	(645.0)	(682.5)	(683.0)	(810.0)	(1,015.2)	(910.3)	(894.2)	(916.3)	(903.8)	(933.4)
Depreciation/Amortization/Impairment	(643.6)	(695.1)	(1,174.4)	(1,385.2)	(1,462.8)	(1,406.0)	(1,459.4)	(1,468.2)	(1,470.2)	(1,512.3)	(1,566.2)
<i>Depreciation</i>	541.8	594.9	1,074.7	1,154.7	1,382.3	1,316.3	1,369.2	1,378.7	1,379.8	1,419.6	1,471.7
<i>Amortization of Intangibles</i>	100.3	99.3	99.7	131.7	83.4	89.7	90.2	89.5	90.4	92.7	94.5
<i>Impairment</i>	1.5	0.9	0.0	98.8	11.4	0.0	0.0	0.0	0.0	0.0	0.0
Other operating result	(306.1)	(290.9)	(268.8)	(279.7)	(315.1)	(364.8)	(486.0)	(414.0)	(382.6)	(373.2)	(378.0)
<b>Operating Result</b>	353.9	400.1	775.2	1,284.3	9,362.3	9,892.0	4,886.5	2,273.6	1,605.1	1,736.1	1,998.0
Share of Profit of Equity-Accounted Investees	38.1	30.7	35.5	32.1	28.8	33.0	32.2	32.3	31.8	31.6	32.2
Result from Investments and Securities	18.9	12.7	0.7	(1.2)	(1.2)	0.0	0.0	0.0	0.0	0.0	0.0
<b>Earnings Before Interest and Taxes (EBIT)</b>	410.9	443.5	811.4	1,315.2	9,389.9	9,925.0	4,918.7	2,306.0	1,636.8	1,767.8	2,030.2
Interest Inc.(Exp.),Net-Non-Op., Total	(354.7)	(365.2)	(396.7)	(330.5)	(245.2)	(315.8)	(421.0)	(500.4)	(552.3)	(603.7)	(694.0)
<i>Interest Expense, Net Non-Operating</i>	(366.0)	(381.0)	(408.9)	(347.5)	(266.5)	(345.7)	(446.1)	(522.5)	(574.2)	(624.6)	(716.1)
<i>Interest/Invest Income - Non-Operating</i>	11.3	15.8	12.2	17.0	21.3	29.9	25.0	22.1	21.9	20.9	22.1
Other financial items	0.0	(0.5)	1.6	(3.5)	1.7	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net Income Before Taxes (EBT)</b>	56.2	77.8	416.3	981.2	9,146.4	9,609.3	4,497.7	1,805.6	1,084.5	1,164.1	1,336.2
Provision for Income Taxes	(24.1)	(31.8)	(42.9)	(45.8)	(61.3)	(496.0)	(232.1)	(93.2)	(56.0)	(60.1)	(69.0)
<b>Net Income</b>	32.1	46.0	373.4	935.4	9,085.1	9,113.3	4,265.5	1,712.4	1,028.5	1,104.0	1,267.2
Minority Interest	4.7	9.2	11.4	8.6	10.4	127.3	34.7	13.3	10.2	9.5	11.1
Net profit attributable shareholders	27.4	36.8	362.0	926.8	9,074.7	8,986.0	4,230.8	1,699.2	1,018.3	1,094.5	1,256.1

## Appendix 20: Cash Flow Statement



Annual Standardised in Millions of Euros

Cash Flow Statement	2022F	2023F	2024F	2025F	2026F	2027F
<b>Cash Flow-Operating Activities (€ Millions)</b>						
+EBIT	9,925.0	4,918.7	2,306.0	1,636.8	1,767.8	2,030.2
+D&A	1,406.0	1,459.4	1,468.2	1,470.2	1,512.3	1,566.2
-Income Tax	(496.0)	(232.1)	(93.2)	(56.0)	(60.1)	(69.0)
-DNWC	(388.8)	718.2	477.6	140.9	(28.1)	(81.4)
<b>Cash from Operating Activities</b>	10,446.3	6,864.1	4,158.6	3,192.0	3,191.9	3,446.1
<b>Cash Flow-Investing Activities (€ Millions)</b>						
-CAPEX	(2,511.9)	(2,224.8)	(1,767.2)	(2,200.4)	(2,077.0)	(2,145.1)
+ -Other Inv.	0.0	0.0	0.0	0.0	0.0	0.0
<b>Cash from Investing Activities</b>	(2,511.9)	(2,224.8)	(1,767.2)	(2,200.4)	(2,077.0)	(2,145.1)
<b>Cash Flow-Financing Activities (€ Millions)</b>						
-Interest paid	(315.8)	(421.0)	(500.4)	(552.3)	(603.7)	(694.0)
-Dividends	(6,561.6)	(3,199.1)	(2,449.1)	(2,013.7)	(2,010.7)	(2,097.7)
-DDebt	241.7	1,606.7	1,333.2	978.6	1,145.5	1,195.2
<b>Cash from Financing Activities</b>	(6,635.6)	(2,013.5)	(1,616.2)	(1,587.4)	(1,468.9)	(1,596.5)
Foreign Exchange Effects	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net Change in Cash</b>	1,298.8	2,625.8	775.2	(595.8)	(354.0)	(295.5)

## Appendix 21: Key Financial Ratios



Key Financial Ratios	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F
<b>Liquidity Ratios</b>											
Current Ratio (x)	0.79	0.73	0.60	0.67	1.92	2.31	2.46	2.32	2.16	2.03	1.93
Quick Ratio (x)	0.73	0.66	0.54	0.63	1.86	2.23	2.40	2.27	2.11	1.99	1.89
Cash Ratio (x)	0.29	0.27	0.21	0.27	0.68	0.70	0.78	0.81	0.80	0.80	0.79
<b>Efficiency Ratios</b>											
Total Assets Turnover (x)	0.67	0.76	0.78	0.84	0.83	0.88	0.67	0.60	0.58	0.56	0.58
Accounts Receivables Days (x)	8.18	7.99	8.46	7.84	6.78	7.80	7.73	7.68	7.55	7.49	7.65
Collection Period (days)	44.61	45.68	43.16	46.55	53.83	46.77	47.20	47.50	48.37	48.74	47.72
Inventory Turnover (x)	53.62	48.81	50.63	74.26	66.09	57.15	57.92	60.16	62.52	60.60	59.61
Inventory Days (days)	6.81	7.48	7.21	4.92	5.52	6.39	6.30	6.07	5.84	6.02	6.12
Payables Turnover (x)	6.39	6.55	7.09	7.31	9.55	10.03	7.96	6.77	6.45	6.48	6.71
Payables Days(days)	57.09	55.74	51.50	49.95	38.21	36.40	45.84	53.91	56.60	56.35	54.36
Operating Cycle (days)	61.80	56.80	59.09	82.10	72.87	64.96	65.65	67.85	70.06	68.09	67.26
Cash Cycle (days)	4.71	1.07	7.59	32.15	34.66	28.56	19.81	13.94	13.46	11.74	12.90
Fixed Assets Turnover	0.79	0.90	0.91	1.01	1.46	1.57	1.25	1.13	1.04	1.00	1.00
<b>Profitability Ratios</b>											
Gross Profit Margin (%)	13.07%	11.93%	17.60%	23.09%	50.02%	45.22%	31.80%	21.09%	18.25%	19.38%	20.43%
EBITDA Margin (%)	10.57%	9.80%	15.75%	21.14%	48.72%	43.94%	29.69%	19.15%	16.40%	17.55%	18.63%
EBIT Margin (%)	4.12%	3.82%	6.44%	10.30%	42.16%	38.49%	22.89%	11.70%	8.64%	9.46%	10.52%
Net Profit Margin (%)	0.32%	0.40%	2.96%	7.32%	40.79%	35.34%	19.85%	8.69%	5.43%	5.91%	6.57%
ROA (%)	0.22%	0.30%	2.30%	6.16%	34.01%	31.13%	13.31%	5.21%	3.12%	3.33%	3.79%
ROCE (%)	0.47%	0.65%	3.41%	8.61%	44.06%	40.54%	17.30%	6.88%	4.16%	4.47%	5.11%
ROE (%)	0.53%	0.73%	5.64%	13.91%	56.21%	48.70%	21.56%	8.99%	5.70%	6.44%	7.76%
NI/S (%)	0.32%	0.40%	2.96%	7.32%	40.79%	35.34%	19.85%	8.69%	5.43%	5.91%	6.57%
S/A (%)	67.26%	75.93%	77.83%	84.12%	83.37%	88.09%	67.04%	59.97%	57.54%	56.42%	57.69%
A/E (%)	244.73%	244.46%	244.68%	225.87%	165.28%	156.43%	162.03%	172.58%	182.30%	193.11%	204.96%
EPS (x)	0.18	0.26	2.12	5.32	51.69	51.85	24.27	9.74	5.85	6.28	7.21
SG&A/Sale (%)	6.82%	5.55%	5.41%	5.35%	3.64%	3.94%	4.24%	4.54%	4.84%	4.84%	4.84%
<b>Solvency Ratios</b>											
Debt Ratio (%)	42.73%	39.33%	39.49%	33.83%	20.58%	19.61%	22.92%	26.41%	29.34%	32.62%	35.87%
Long-term Debt Ratio (%)	37.98%	34.65%	31.83%	27.46%	15.49%	15.49%	17.99%	20.49%	22.99%	25.49%	27.99%
Short-term Debt Ratio(%)	4.75%	4.68%	7.66%	6.36%	5.09%	4.11%	4.93%	5.91%	6.34%	7.12%	7.87%
Debt to Equity Ratio (x)	1.05	0.96	0.97	0.76	0.34	0.31	0.37	0.46	0.53	0.63	0.74
Equity Multiplier (x)	2.45	2.44	2.45	2.26	1.65	1.56	1.62	1.73	1.82	1.93	2.05
Debt to EBITDA (x)	6.01	5.29	3.22	1.90	0.51	0.51	1.15	2.30	3.11	3.29	3.34
Interest Coverage Ratio (x)	1.16	1.21	2.05	3.98	38.29	31.43	11.68	4.61	2.96	2.93	2.93

## Appendix 22: Common-Size Statement of Financial Position

Balance Sheets	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F
<b>Assets (€ Millions)</b>											
Cash and Short Term Investments	4.32%	4.34%	3.16%	4.48%	28.91%	30.82%	36.34%	37.80%	35.92%	34.64%	33.41%
Total Receivables, Net	8.22%	9.50%	9.20%	10.73%	12.30%	11.29%	8.67%	7.80%	7.63%	7.53%	7.54%
Total Inventory	1.25%	1.56%	1.54%	1.13%	1.26%	1.54%	1.16%	1.00%	0.92%	0.93%	0.97%
Prepaid Expenses	0.20%	0.11%	0.17%	0.14%	0.12%	0.17%	0.12%	0.11%	0.10%	0.10%	0.10%
Other Current Assets, Total	0.80%	0.55%	0.68%	0.31%	0.20%	0.19%	0.18%	0.18%	0.19%	0.19%	0.19%
<b>Total Current Assets</b>	<b>14.80%</b>	<b>16.05%</b>	<b>14.75%</b>	<b>16.80%</b>	<b>42.79%</b>	<b>44.01%</b>	<b>46.47%</b>	<b>46.89%</b>	<b>44.76%</b>	<b>43.39%</b>	<b>42.22%</b>
Property/Plant/Equipment, Total - Net	60.47%	59.60%	62.14%	61.25%	44.04%	43.76%	42.22%	42.03%	44.05%	45.39%	46.57%
<i>Property/Plant/Equipment, Total - Gross</i>	<i>76.45%</i>	<i>79.62%</i>	<i>87.58%</i>	<i>92.07%</i>	<i>66.84%</i>	<i>69.05%</i>	<i>69.60%</i>	<i>72.93%</i>	<i>79.09%</i>	<i>84.50%</i>	<i>89.69%</i>
<i>Accumulated Depreciation, Total</i>	<i>15.98%</i>	<i>20.02%</i>	<i>25.45%</i>	<i>30.82%</i>	<i>22.80%</i>	<i>25.30%</i>	<i>27.38%</i>	<i>30.89%</i>	<i>35.03%</i>	<i>39.11%</i>	<i>43.12%</i>
Goodwill, Net	10.03%	10.25%	9.88%	9.66%	5.98%	5.45%	4.98%	4.86%	4.85%	4.82%	4.77%
Intangibles, Net	12.04%	11.59%	10.60%	9.61%	5.65%	5.37%	5.04%	4.96%	5.08%	5.15%	5.20%
<i>Intangibles - Gross</i>	<i>14.55%</i>	<i>14.63%</i>	<i>14.14%</i>	<i>13.32%</i>	<i>8.26%</i>	<i>8.05%</i>	<i>7.77%</i>	<i>7.90%</i>	<i>8.29%</i>	<i>8.61%</i>	<i>8.91%</i>
<i>Accumulated Intangible Amortization</i>	<i>2.51%</i>	<i>3.04%</i>	<i>3.54%</i>	<i>3.71%</i>	<i>2.61%</i>	<i>2.68%</i>	<i>2.73%</i>	<i>2.94%</i>	<i>3.21%</i>	<i>3.47%</i>	<i>3.72%</i>
Long Term Investments	2.35%	2.16%	2.11%	2.22%	1.27%	1.16%	1.06%	1.03%	1.03%	1.03%	1.02%
Note Receivable - Long Term	0.05%	0.06%	0.06%	0.08%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Other Long Term Assets, Total	0.27%	0.29%	0.48%	0.38%	0.22%	0.20%	0.18%	0.18%	0.18%	0.18%	0.17%
<i>Deferred Charges</i>	<i>0.01%</i>	<i>0.01%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>	<i>0.00%</i>
<i>Defered Income Tax - Long Term Asset</i>	<i>0.17%</i>	<i>0.24%</i>	<i>0.25%</i>	<i>0.19%</i>	<i>0.10%</i>	<i>0.09%</i>	<i>0.08%</i>	<i>0.08%</i>	<i>0.08%</i>	<i>0.08%</i>	<i>0.08%</i>
<i>Other Long Term Assets</i>	<i>0.09%</i>	<i>0.05%</i>	<i>0.23%</i>	<i>0.19%</i>	<i>0.12%</i>	<i>0.11%</i>	<i>0.10%</i>	<i>0.09%</i>	<i>0.09%</i>	<i>0.09%</i>	<i>0.09%</i>
<b>Total Non-Current Assets</b>	<b>85.21%</b>	<b>83.96%</b>	<b>85.25%</b>	<b>83.20%</b>	<b>57.21%</b>	<b>55.99%</b>	<b>53.53%</b>	<b>53.11%</b>	<b>55.24%</b>	<b>56.61%</b>	<b>57.78%</b>
<b>Total Assets</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
<b>Liabilities (€ Millions)</b>											
Accounts Payable	10.52%	11.59%	10.98%	11.51%	8.73%	8.78%	8.42%	8.86%	8.92%	8.71%	8.59%
Accrued Expenses	0.29%	0.16%	0.20%	0.16%	0.07%	0.14%	0.12%	0.12%	0.12%	0.11%	0.12%
Notes Payable/Short Term Debt	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Current Port. of LT Debt/Capital Leases	4.75%	4.68%	7.66%	6.36%	5.09%	4.11%	4.93%	5.91%	6.34%	7.12%	7.87%
Other Current liabilities, Total	3.10%	5.63%	5.80%	6.95%	8.41%	5.99%	5.41%	5.28%	5.38%	5.40%	5.27%
<i>Customer Advances</i>	<i>0.83%</i>	<i>1.95%</i>	<i>2.31%</i>	<i>3.61%</i>	<i>5.42%</i>	<i>3.09%</i>	<i>2.66%</i>	<i>2.55%</i>	<i>2.59%</i>	<i>2.57%</i>	<i>2.40%</i>
<i>Income Taxes Payable</i>	<i>0.29%</i>	<i>0.41%</i>	<i>0.36%</i>	<i>0.33%</i>	<i>0.25%</i>	<i>0.23%</i>	<i>0.21%</i>	<i>0.20%</i>	<i>0.20%</i>	<i>0.20%</i>	<i>0.20%</i>
<i>Other Current Liabilities</i>	<i>1.98%</i>	<i>3.27%</i>	<i>3.12%</i>	<i>3.02%</i>	<i>2.74%</i>	<i>2.67%</i>	<i>2.54%</i>	<i>2.53%</i>	<i>2.59%</i>	<i>2.63%</i>	<i>2.67%</i>
<b>Total Current Liabilities</b>	<b>18.65%</b>	<b>22.07%</b>	<b>24.65%</b>	<b>24.99%</b>	<b>22.30%</b>	<b>19.03%</b>	<b>18.87%</b>	<b>20.18%</b>	<b>20.77%</b>	<b>21.35%</b>	<b>21.86%</b>
Total Long Term Debt	37.98%	34.65%	31.83%	27.46%	15.49%	15.49%	17.99%	20.49%	22.99%	25.49%	27.99%
Total Debt	42.73%	39.33%	39.49%	33.83%	20.58%	19.61%	22.92%	26.41%	29.34%	32.62%	35.87%
Deferred Income Tax	0.03%	0.03%	0.06%	0.07%	0.05%	0.05%	0.04%	0.04%	0.04%	0.04%	0.04%
Minority Interest	0.09%	0.07%	0.09%	0.10%	0.05%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Other Liabilities, Total	2.49%	2.34%	2.60%	3.21%	1.65%	1.51%	1.38%	1.34%	1.34%	1.33%	1.32%
<i>Reserves</i>	<i>0.54%</i>	<i>0.50%</i>	<i>0.41%</i>	<i>0.48%</i>	<i>0.38%</i>	<i>0.34%</i>	<i>0.32%</i>	<i>0.31%</i>	<i>0.31%</i>	<i>0.30%</i>	<i>0.30%</i>
<i>Pension Benefits - Underfunded</i>	<i>1.83%</i>	<i>1.74%</i>	<i>2.03%</i>	<i>2.47%</i>	<i>1.17%</i>	<i>1.07%</i>	<i>0.97%</i>	<i>0.95%</i>	<i>0.95%</i>	<i>0.94%</i>	<i>0.93%</i>
<i>Other Long Term Liabilities</i>	<i>0.11%</i>	<i>0.10%</i>	<i>0.17%</i>	<i>0.26%</i>	<i>0.10%</i>	<i>0.10%</i>	<i>0.09%</i>	<i>0.09%</i>	<i>0.09%</i>	<i>0.08%</i>	<i>0.08%</i>
<b>Total Liabilities</b>	<b>59.14%</b>	<b>59.09%</b>	<b>59.14%</b>	<b>55.73%</b>	<b>39.50%</b>	<b>36.08%</b>	<b>38.28%</b>	<b>42.06%</b>	<b>45.14%</b>	<b>48.22%</b>	<b>51.21%</b>
<b>Shareholders Equity (€ Millions)</b>											
Common Stock, Total	1.19%	1.15%	1.09%	1.16%	0.66%	0.60%	0.55%	0.54%	0.53%	0.53%	0.53%
Additional Paid-In Capital	17.78%	17.23%	16.28%	17.37%	9.87%	9.01%	8.23%	8.02%	8.01%	7.96%	7.88%
Retained Earnings (Accumulated Deficit)	21.41%	20.37%	21.18%	27.40%	47.20%	51.79%	50.63%	47.13%	44.06%	41.05%	38.17%
Other Equity, Total	0.40%	2.08%	2.24%	-1.75%	-2.73%	-2.49%	-2.27%	-2.21%	-2.21%	-2.20%	-2.18%
<b>Total Equity</b>	<b>40.86%</b>	<b>40.91%</b>	<b>40.87%</b>	<b>44.27%</b>	<b>60.50%</b>	<b>63.92%</b>	<b>61.72%</b>	<b>57.94%</b>	<b>54.86%</b>	<b>51.78%</b>	<b>48.79%</b>
<b>Total Liabilities &amp; Shareholders' Equity</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

## Appendix 23: Common-Size Cash Flow Statement

Cash Flow-Operating Activities (€ Millions)						
+EBIT	95.01%	71.66%	55.45%	51.28%	55.38%	58.91%
+D&A	13.46%	21.26%	35.30%	46.06%	47.38%	45.45%
-Income Tax	-4.75%	-3.38%	-2.24%	-1.75%	-1.88%	-2.00%
-DNWC	-3.72%	10.46%	11.49%	4.41%	-0.88%	-2.36%
<b>Cash from Operating Activities</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
Cash Flow-Investing Activities (€ Millions)						
-CAPEX	-24.05%	-32.41%	-42.50%	-68.93%	-65.07%	-62.25%
+ -Other Inv.						
<b>Cash from Investing Activities</b>	<b>-24.05%</b>	<b>-32.41%</b>	<b>-42.50%</b>	<b>-68.93%</b>	<b>-65.07%</b>	<b>-62.25%</b>
Cash Flow-Financing Activities (€ Millions)						
-Interest paid	-3.02%	-6.13%	-12.03%	-17.30%	-18.91%	-20.14%
-Dividends	-62.81%	-46.61%	-58.89%	-63.09%	-62.99%	-60.87%
-DDebt	2.31%	23.41%	32.06%	30.66%	35.89%	34.68%
<b>Cash from Financing Activities</b>	<b>-63.52%</b>	<b>-29.33%</b>	<b>-38.86%</b>	<b>-49.73%</b>	<b>-46.02%</b>	<b>-46.33%</b>

## Appendix 24: Common-Size Income Statement

Income Statement	2016	2017	2018	2019	2020	2021F	2022F	2023F	2024F	2025F	2026F
<b>Revenue</b>	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Transport expenses	80.11%	82.52%	76.99%	71.56%	46.35%	50.84%	63.97%	74.38%	76.91%	75.78%	74.74%
Personnel expenses	6.82%	5.55%	5.41%	5.35%	3.64%	3.94%	4.24%	4.54%	4.84%	4.84%	4.84%
Depreciation/Amortization/Impairment	6.45%	5.98%	9.31%	10.85%	6.57%	5.45%	6.79%	7.45%	7.76%	8.09%	8.12%
<i>Depreciation</i>	5.43%	5.12%	8.52%	9.04%	6.21%	5.10%	6.37%	6.99%	7.28%	7.60%	7.63%
<i>Amortization of Intangibles</i>	1.01%	0.85%	0.79%	1.03%	0.37%	0.35%	0.42%	0.45%	0.48%	0.50%	0.49%
<i>Impairment</i>	0.02%	0.01%	0.00%	0.77%	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other operating result	3.07%	2.50%	2.13%	2.19%	1.41%	1.41%	2.26%	2.10%	2.02%	2.00%	1.96%
<b>Operating Result</b>	3.55%	3.44%	6.15%	10.06%	42.03%	38.36%	22.74%	11.54%	8.47%	9.29%	10.35%
Share of Profit of Equity-Accounted Investees	0.38%	0.26%	0.28%	0.25%	0.13%	0.13%	0.15%	0.16%	0.17%	0.17%	0.17%
Result from Investments and Securities	-0.19%	0.11%	0.01%	-0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Earnings Before Interest and Taxes (EBIT)</b>	4.12%	3.82%	6.44%	10.30%	42.16%	38.49%	22.89%	11.70%	8.64%	9.46%	10.52%
Interest Inc.(Exp.),Net-Non-Op., Total	3.56%	3.14%	3.15%	2.59%	1.10%	1.22%	1.96%	2.54%	2.92%	3.23%	3.60%
<i>Interest Expense, Net Non-Operating</i>	3.67%	3.28%	3.24%	2.72%	1.20%	1.34%	2.08%	2.65%	3.03%	3.34%	3.71%
<i>Interest/Invest Income - Non-Operating</i>	0.11%	0.14%	0.10%	0.13%	0.10%	0.12%	0.12%	0.11%	0.12%	0.11%	0.11%
Other financial items	0.00%	0.00%	0.01%	-0.03%	-0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Net Income Before Taxes (EBT)</b>	0.56%	0.67%	3.30%	7.68%	41.06%	37.26%	20.93%	9.16%	5.72%	6.23%	6.92%
Provision for Income Taxes	0.24%	0.27%	0.34%	0.36%	0.28%	1.92%	1.08%	0.47%	0.30%	0.32%	0.36%
<b>Net Income</b>	0.32%	0.40%	2.96%	7.32%	40.79%	35.34%	19.85%	8.69%	5.43%	5.91%	6.57%
Minority Interest	0.05%	0.08%	0.09%	0.07%	0.05%	0.49%	0.16%	0.07%	0.05%	0.05%	0.06%
<i>Net profit attributable shareholders</i>	0.27%	0.32%	2.87%	7.26%	40.74%	34.84%	19.69%	8.62%	5.38%	5.86%	6.51%

## Appendix 25: Forecasting Assumptions

### For income statement

Income Statement	Note	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	Assumption
Revenue		9973.4	11617.5	12607.9	12772.4	22273.5	25788.8	21485.7	19709.7	18944.6	18686.7	19299.5	See "Revenue and Costs"
Transport Expenses	%Revenue	-7990	-9586.4	-9707	-9140.2	-10323.3	-13110.8	-13743.6	-14659.8	-14570.4	-14161.2	-14423.7	
Personnel expenses	%Revenue	-6.82%	-5.55%	-5.41%	-5.35%	-3.64%	-3.94%	-4.24%	-4.54%	-4.84%	-4.84%	-4.84%	Expected to grow in line with Revenue, with the proportion of average percentage of last 5 years. The development of investment in employee and good financial results achieved, the proportion is expected to increase by 0.3% in 2023 till 2025.
Depreciation/Amortization/ Impairment													Expected to grow in line with Net PPE of last year, with the proportion of average percentage of last 4 years. The proportion is expected to decrease 0.5% per year due to the delivery of new vessels till FY24. After FY24, the depreciation rate is expected to decrease 0.2% till FY26.
Depreciation	%PPE of last year		6.63%	11.78%	11.47%	14.86%	11.19%	10.69%	10.19%	9.99%	9.79%	9.79%	
Amortization	%Intangibles of last year		5.56%	5.62%	7.67%	5.72%	5.94%	5.74%	5.54%	5.54%	5.54%	5.54%	
Impairment	0	1.5	0.9	0	98.8	11.4	0	0	0	0	0	0	
Other operating result	%Revenue	3.07%	2.50%	2.13%	2.19%	1.41%	2.26%	2.10%	2.02%	2.00%	1.96%	2.07%	Expected to grow in line with Revenue, with the proportion of average percentage in last 5 years.
Share of Profit of Equity	%LT investment	10.95%	9.27%	10.38%	9.53%	8.47%	9.72%	9.47%	9.51%	9.34%	9.30%	9.47%	Expected to grow in line with Long Term investment, with the proportion of average percentage in last 5 years.
Result from Investments and Securities	0	18.9	12.7	0.7	-1.2	-1.2	0	0	0	0	0	0	Expected to be 0 since it is not operational revenue
Interest Expenses	%Total debt	5.78%	6.33%	6.39%	6.77%	4.85%	6.02%	6.07%	6.02%	5.95%	5.78%	5.97%	Expected to be %Total debt, with the proportion of average percentage in last 5 years.
Interest/Invest Income	% Total Receivable	0.93%	1.09%	0.82%	1.04%	0.65%	0.90%	0.90%	0.86%	0.87%	0.84%	0.88%	According to the company, this item is expected to be %of total Receivables, with the proportion of average percentage in last 5 years.
Other financial items	0	0	-0.5	1.6	-3.5	1.7	0	0	0	0	0	0	Expected to be 0 since it is not operational
Provision for Income Taxes	YoY	42.88%	40.87%	10.31%	4.67%	0.67%	5.16%	5.16%	5.16%	5.16%	5.16%	5.16%	Expected tax expense is subject to tonnage and regular taxation. However, the former depends on tonnage of company's fleet. Therefore, for forecast purpose, use Effective Tax Rates for shipbuilding and marine industry in Germany disclosed by Aswath Damodaran.
Minority Interest	%Net income	17.15%	25.00%	3.15%	0.93%	0.11%	1.40%	0.81%	0.78%	1.00%	0.86%	0.88%	Expected to grow as %Net income, with the proportion of average percentage in last 3 years



## For Balance sheet

Balance Sheet	Note	2017	2018	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	Assumption
Total Receivables													
Days Receivables Outstanding		44.61	45.68	43.16	46.55	53.83	46.77	47.20	47.50	48.37	48.74	47.72	Average receivables outstanding days in last 5 years.
Receivables Turnover		8.18	7.99	8.46	7.84	6.78	7.80	7.73	7.68	7.55	7.49	7.65	
Inventories	%Revenue	1.86%	2.05%	1.97%	1.35%	1.51%	1.75%	1.73%	1.66%	1.60%	1.65%	1.68%	Inventories consist of raw materials, consumables and supplies. It is expected to grow as %Revenue, with proportion of average percentage in last 5 years.
Prepaid Expenses	%Revenue	0.30%	0.15%	0.21%	0.17%	0.14%	0.20%	0.17%	0.18%	0.17%	0.17%	0.18%	Related to transportation charges paid in advance, and are expected to grow as %Revenue, with a proportion of average percentage in last 5 years, due to low bargain power of suppliers.
Other Current Assets, Total	YoY	119	94	110	47	53	6.50%	4.10%	2.40%	2.40%	2.40%	2.40%	Expected to grow at the Inflation Rate
CAPEX	%Revenue		7.28%	15.91%	-1.63%	17.40%	9.74%	10.35%	8.97%	11.61%	11.11%	11.11%	Expected to grow as % Revenue, with a proportion of average percentage in last 4 years to invest in replacement investment and retrofitting of ocean-going vessels and containers, also invest in CAPEX expansion.
For PPE	%CAPEX					94.31%	94%	94%	94%	94%	94%	94%	Expected to grow with CAPEX, with the proportion of the same distribution of CAPEX addition in 2021, disclosed in Note when company start to retrofitting due to regulation of IMO.
For Intangibles	%CAPEX					5.69%	6%	6%	6%	6%	6%	6%	Expected to grow with CAPEX, with the proportion of the same distribution of CAPEX addition in 2021, disclosed in Note when company start to retrofitting due to regulation of IMO.
Good will	=	1487	1569	1601	1467	1597	1597	1597	1597	1597	1597	1597	Goodwill is related to the acquisition to further presence in Africa and no impairments are expected in the foreseen period.
Long Term Investments	=	348	331	342	337	340	340	340	340	340	340	340	Expected to be constant over the forecasting period, with amount of 2021YE.
Note Receivable - Long Term	=	8	9	9	12	14	16	16	16	16	16	16	Expected to be constant over the forecasting period, with amount of 2021YE.
Deferred Charges	=	1	1	0	0	1	1	1	1	1	1	1	Expected to be constant over the forecasting period, with amount of 2021YE.
Deferred Income Tax	=	25	36	40	29	26	26	26	26	26	26	26	Expected to be constant over the forecasting period, with amount of 2021YE.
Other Long Term Assets	=	14	7	38	29	31	31	31	31	31	31	31	Expected to be constant over the forecasting period, with amount of 2021YE.
Accounts Payable													
Days Payables Outstanding	0.5	71.3	67.5	66.9	69.8	82.5	71.6	71.7	72.5	73.6	74.4	72.7	Average payables outstanding days in last 5 years.
Payables Turnover		5.12	5.40	5.46	5.23	4.43	5.10	5.09	5.04	5.04	4.91	5.02	
Accrued Expenses	%Transport Expense	-0.54%	-0.25%	-0.34%	-0.26%	-0.19%	-0.32%	-0.27%	-0.28%	-0.26%	-0.27%	-0.28%	Expected to be %Transport Expenses, with a proportion of average percentage in last 5 years.
Current Port. of LT Debt	% Total debt	11.1%	11.9%	19.4%	18.8%	24.7%	21.0%	21.5%	22.4%	21.6%	21.8%	22.0%	Expected to grow as %Total Debt, with a proportion of average percentage in last 3 years.
Customer Advances	%Revenue	1.23%	2.57%	2.97%	4.29%	6.50%	3.51%	3.97%	4.25%	4.50%	4.55%	4.16%	Expected to grow as %Revenue, with a proportion of average percentage in last 5 years.
Income Taxes Payable	=	43	63	59	50	67	67	67	67	67	67	67	Expected to be constant over the forecasting period, with amount of 2021YE.
Other Current Liabilities	YoY	294	501	506	458	733	6.50%	4.10%	2.40%	2.40%	2.40%	2.40%	Expected to grow at the Inflation Rate
Total long term debt	% Total Equity and Liabilities	37.98%	34.65%	31.83%	27.46%	15.49%	15.49%	17.99%	20.49%	22.99%	25.49%	27.99%	Expected to grow as %Total Equity and Liabilities, with the proportion of 2021YE in 2022 due to the strong financial performance achieved by the company. The proportion is expected to be increase 2.5% per year linked to the new vessel ordered and other necessary investment.
Deferred Income Tax	=	4	5	9	10	14	14	14	14	14	14	14	Expected to be constant over the forecasting period, with amount of 2021YE.
Minority Interest	=	13	11	14	15.5	13	13	13	13	13	13	13	Expected to be constant over the forecasting period, with amount of 2021YE.
Reserves	=	80	76	66	73	101	101	101	101	101	101	101	Expected to be constant over the forecasting period, with amount of 2021YE.
Pension Benefits - Underfunded	=	272	267	329	375.5	312	312	312	312	312	312	312	Expected to be constant over the forecasting period, with amount of 2021YE.
Other Long Term Liabilities	=	17	16	27	39	28	28	28	28	28	28	28	Expected to be constant over the forecasting period, with amount of 2021YE.
Common Stock, Total	=	176	176	176	176	176	176	176	176	176	176	176	Expected to be constant over the forecasting period, with amount of 2021YE.
Additional Paid-In Capital	=	2637	2637	2637	2637	2637	2637	2637	2637	2637	2637	2637	Expected to be constant over the forecasting period, with amount of 2021YE.
Other Equity, Total	=	59	318	363	-266	728	728	728	728	728	728	728	Total Equity comprises the reserve for remeasurements from defined benefit pension plans and so on, expected to be constant over the forecast period, with amount of 2021YE.
Payout Ratio						69.00%	72.00%	75.00%	75.00%	75.00%	75.00%	75.00%	Company disclosed the payout ratio of 2021 was 69%. The average payout ratio from 2018-2021 is above 60%, so the payout ratio is expected with a 3% YoY increase till 2023, then keep the same in the rest forecast period. Start from 2024, a special dividend is expected as the common dividend is forecasted to decrease due to lower net income, but the cash of the company is accumulated till higher than 10% of the total assets.

## Appendix 26: Revenue and Cost Estimation

### Revenue Forecast

In blue are cells that can be used for sensitivity analysis, scenario analysis, and Monte Carlo Simulations

Freight rates per trade (USD/TEU)						
Freight rates per trade (USD/TEU)	2017	2018	2019	2020	2021	
Total average freight rates	1036	1060	1044	1115	2003	207.8441089
Freight rates growth rate		2.32%	-1.51%	6.80%	79.64%	196.8927246
Inflation		3.20%	3.60%	3.50%	3.20%	210.637771
Real growth rate		-0.86%	-4.93%	3.19%	74.07%	195.8666654

Freight rates per trade (USD/TEU)							Assumptions
Freight rates per trade (USD/TEU)	2022F	2023F	2024F	2025F	2026F	2027F	
Total average freight rates	2133.2	1749.2	1591.8	1512.2	1466.8	1491.5	Expected to remain at elevated levels as demand remains strong but shipping capacity is constrained and start to decrease slowly since 2H 2022 due to the high supply in the market, but in a moderate way thanks to the contracted rates (50% of volume) were agreed at current spot level as revealed.
Freight rates growth rate	6.50%	-18.00%	-9.00%	-5.00%	-3.00%	1.00%	
Inflation	6.50%	4.10%	2.40%	2.40%	2.40%	2.40%	
Real growth rate	0.00%						

Transport volume (TTEU)						
Transport volume per trade (TTEU)	2017	2018	2019	2020	2021	
Total Transport Volumes	9803	11874	12037	11838	11872	
Transport volume growth rate		21.13%	1.37%	-1.65%	0.29%	

Transport volume (TTEU)							Assumptions
Transport volume per trade (TTEU)	2022F	2023F	2024F	2025F	2026F	2027F	
Total Transport Volumes	11872.0	11929.0	12043.5	12216.9	12451.5	12750.3	Assume company's growth rate of transport volume starts from 1%, and increase 0.28% per year to reach projected world seaborne trade growth rate.
Transport volume growth rate	0.00%	0.48%	0.96%	1.44%	1.92%	2.40%	

Revenues/ in Million \$							
Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Total revenue assigned to trades		25325.3	20866.4	19170.7	18474.4	18264.3	18889.7
<b>Assumptions</b>							
% By Region							
Atlantic	% Rev	14.84%	15.09%	15.18%	15.11%	15.07%	15.05%
Transpacific	% Rev	18.37%	18.23%	18.11%	18.03%	17.98%	17.95%
Far East	% Rev	21.89%	22.20%	22.28%	22.43%	22.44%	22.44%
Middle East	% Rev	8.72%	8.47%	8.59%	8.68%	8.76%	8.79%
Intra-Asia	% Rev	3.43%	3.83%	3.96%	4.22%	4.31%	4.38%
Latin America	% Rev	19.92%	19.66%	19.55%	19.42%	19.46%	19.46%
Africa	% Rev	4.36%	4.69%	4.64%	4.66%	4.74%	4.82%
Revenue not assigned to trades	% Rev	8.48%	7.84%	7.70%	7.46%	7.25%	7.12%
<b>Change YoY</b>							
		2022F	2023F	2024F	2025F	2026F	2027F
Atlantic		0.40%	0.25%	0.09%	-0.07%	-0.04%	-0.02%
Transpacific		-0.05%	-0.14%	-0.12%	-0.08%	-0.05%	-0.03%
Far East		0.50%	0.31%	0.08%	0.15%	0.01%	0.00%
Middle East		-0.21%	-0.25%	0.12%	0.09%	0.08%	0.03%
Intra-Asia		0.44%	0.40%	0.13%	0.26%	0.09%	0.07%
Latin America		-0.20%	-0.26%	-0.11%	-0.13%	0.04%	0.00%
Africa		0.41%	0.33%	-0.05%	0.02%	0.08%	0.08%
Revenue not assigned to trades		-1.28%	-0.64%	-0.14%	-0.24%	-0.21%	-0.13%
<b>Total Revenue</b>							
Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Total Revenue assigned to trade	USD	25325.3	20866.4	19170.7	18474.4	18264.3	18889.7
Total Revenue	USD	27670.4	22640.3	20769.0	19962.7	19690.9	20336.7
Growth %	YoY	5.0%	-18.2%	-8.3%	-3.9%	-1.4%	3.3%
Average exchange rate	USD/EUR	0.93	0.95	0.95	0.95	0.95	0.95
Total Revenue	EUR	25788.8	21485.7	19709.7	18944.6	18686.7	19299.5
<b>Assumptions</b>							
% By Region	YE						
Atlantic		3826.1	3241.4	2991.2	2861.8	2815.4	2903.9
Transpacific		4737.4	3916.8	3569.4	3415.7	3359.9	3464.3
Far East		5644.4	4769.1	4390.7	4248.7	4192.7	4330.2
Middle East		2248.8	1819.8	1693.1	1644.4	1637.0	1696.4
Intra-Asia		884.6	822.9	780.5	799.5	805.4	845.3
Latin America		5136.4	4223.5	3852.7	3678.5	3635.9	3755.2
Africa		1125.5	1008.6	915.4	883.6	886.5	931.1
Revenue not assigned to trades		2185.7	1683.5	1516.7	1412.4	1353.9	1373.2

Assume company's growth rate of transport volume starts from 1%, and increase 0.28% per year to reach projected world seaborne trade growth rate, due to the Strategy 2023 Plan implemented by company.

The real growth rate of freight rate is expected to remain at elevated levels as demand remains strong but shipping capacity is constrained and start to decrease slowly since 2H 2022 due to the increasing supply in the market, but in a moderate way thanks to the contracted rates (50% of volume) were agreed at current spot level as revealed by the company.

The total revenue in EUR= total revenue assigned to trade in USD/ percentage of total revenue assigned to trade / Average EUR/USD exchange rate

- The growth in Far East / Intra-Asia / Africa comes from the economic recovery from Covid and the acquisition made by the company. Company also put those countries as attractive growth market.

- The growth in Africa comes from the position of those countries in Strategy 2023. Company established new services and expand the office, also in line with the Acquisition of Nile Dutch

## Cost

Description	Notes	2017	2018	2019	2020	2021
Transport Expenses			-953.9	-903.0	-882.0	-1029.0
Bunker			-157.8	-151.0	-136.0	-167.0
Handling and haulage			-472.0	-458.0	-455.0	-537.0
Equipment and repositioning			-122.4	-112.0	-109.0	-122.0
Vessel and Voyage			-199.7	-183.0	-177.0	-193.0
Pending transport expenses			-2.0	1.0	-5.0	-10.0

Description	Notes	2017	2018	2019	2020	2021
Transport Expenses			-158.6	-151.7	-882.0	-1029.0
Bunker			-157.8	-151.0	-136.0	-167.0
Handling and haulage			-45%	-44%	-41%	-27%
Equipment and repositioning	%Total		-12%	-11%	-10%	-6%
Vessel and Voyage	Freight Rate		-19%	-18%	-16%	-10%
Pending transport expenses			-0.2%	0.1%	-0.4%	-0.5%

### Bunker

Description	Notes	2018	2019	2020	2021
Bunker Price	USD / T	421.0	416.0	379.0	475.0
Transport Volume	TEU	11874.0	12037.0	11838.0	11872.0
Bunker consumption	T	4404.0	4377.0	4109.0	4195.0
MFO		4104.0	4024.0	3760.0	3747.0
% total bunker consumption		93.2%	91.9%	91.5%	89.3%
MDO		300.0	353.0	349.0	448.0
% total bunker consumption		6.8%	8.1%	8.5%	10.7%
Bunker consumption per volume	T/TEU	0.37	0.36	0.35	0.35
Crude Oil Price				42.0	70.7
Growth rate					68.45%

### Bunker Assumption

Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Bunker consumption per volume	T/TEU	0.36	0.36	0.35	0.36	0.36	0.36
Transport Volume	TEU	11872.0	11929.0	12043.5	12216.9	12451.5	12750.3
Bunker consumption	T	4259.0	4243.2	4260.1	4341.7	4431.4	4528.6
MFO	T	3896.5	3864.0	3870.1	3937.0	4033.4	4116.6
% total bunker consumption	%	91.5%	91.1%	90.8%	90.7%	91.0%	90.9%
MDO	T	362.5	379.2	390.0	404.7	398.0	412.1
% total bunker consumption	%	8.5%	8.9%	9.2%	9.3%	9.0%	9.1%
Bunker Price		744.0	646.8	585.3	540.5	514.1	497.8
Crude Oil Price		110.7	96.2	87.1	80.4	76.5	74.1
Growth rate		56.62%	-13.06%	-9.51%	-7.65%	-4.89%	-3.18%
Bunker Cost		3168.5	2744.4	2493.4	2346.8	2278.2	2254.3

The crude oil price is based on the price of Brent Crude Oil Dec Future Contract. [https://www.wsj.com/market-data/quotes/futures/UK/IFEU/BRNZ22?mod=quote\\_search](https://www.wsj.com/market-data/quotes/futures/UK/IFEU/BRNZ22?mod=quote_search) as of 14, June, 2022.

### Transport Expenses excl. bunker Assumptions

Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Transport Expenses		-43.04%	-56.25%	-67.57%	-70.40%	-69.23%	-68.53%
Handling and haulage		-26.8%	-34.6%	-40.9%	-42.5%	-42.0%	-41.6%
Equipment and repositioning	%Total	-6.1%	-8.2%	-10.1%	-10.5%	-10.3%	-10.2%
Vessel and Voyage	Freight Rate	-9.6%	-13.2%	-16.4%	-17.1%	-16.7%	-16.5%
Pending transport expenses		-0.5%	-0.3%	-0.2%	-0.2%	-0.2%	-0.3%

### Transport Expenses excl. bunker

Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Transport Expenses (excl. Bunker)		-918.0	-984.0	-1075.6	-1064.6	-1015.5	-1015.2
Handling and haulage		-571.9	-604.8	-651.8	-643.3	-616.7	-616.0
Equipment and repositioning	%Total	-129.9	-142.9	-160.1	-159.2	-150.7	-150.5
Vessel and Voyage	Freight Rate	-205.5	-230.3	-260.3	-259.3	-245.3	-244.8
Pending transport expenses		-10.7	-5.9	-3.5	-2.9	-2.8	-3.9

### Total Transport Cost

Description	Notes	2022F	2023F	2024F	2025F	2026F	2027F
Transport Expenses excl. bunker	USD/TEU	-918.0	-984.0	-1075.6	-1064.6	-1015.5	-1015.2
Total Transport Volumes	TEU	11872.0	11929.0	12043.5	12216.9	12451.5	12750.3
Average exchange rate	USD/EUR	0.932	0.949	0.949	0.949	0.949	0.949
Total Transport Expenses	Million €	-13110.77	-13743.56	-14659.78	-14570.39	-14161.22	-14423.75

## Appendix 27: Risk Free Rate Estimation

Risk Free Rate Estimate			
	2023F	Source	Comments
German Government Bond Yields			
German Bund 10Y Yield	2.30%	Bloomberg (December, 2022)	
German Bund 30Y Yield	1.70%	Bloomberg (December, 2022)	
10Y Average Yields			
German Bond 10Y Yield	1.90%	Bloomberg (December, 2022)	Monthly average
Survey Estimates			
RFR - Germany	1.20%	Fernandez (2022)	<a href="https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990">https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3803990</a>

## Appendix 28: Beta Estimation

Beta Estimate			
	2023F	Source	Comments
Financial Agencies			
Bloomberg	1.24	Bloomberg (July, 2022)	
Refinitiv	0.53	Refinitiv (July, 2022)	
Yahoo Finance	0.91	Yahoo Finance (July, 2022)	
Financial Times	0.92	Financial Times (July, 2022)	
Historical			
Raw beta	0.90		Monthly data for 5 years (60 observations); regression vs DAX
Blume adjusted beta	0.93		
Pure Play Method - Integrated Industry			
Unlevered beta corrected for cash	0.89	Damodaran (2022)	Shipbuilding & Marine
D/(D+E)	27%		Target capital structure
E/(D+E)	73%		Target capital structure
D/E	0.37		
Tax rate	5.16%	Damodaran (2022)	
Levered beta	1.20		

## Appendix 29: Equity Risk Premium Estimation

Equity Risk Premium Estimate			
	2023F	Source	Comments
Historical			
Moody's rating	Aaa	Damodaran (2022)	
S&P rating	AAA	Damodaran (2022)	
Equity risk premium	6.01%	Damodaran (2022)	
Ratings-based default spread	0.00%	Damodaran (2022)	
Country Risk Premium	0.00%	Damodaran (2022)	
Total equity risk premium	6.01%		
Forward-looking			
Required ERP	5.80%	Fernandez (2022)	
Financial Agencies			
Bloomberg	5.90%	Bloomberg (2022)	

## Appendix 30: Cost of Debt Estimation

Cost of Debt Estimate			
	2023F	Source	Comments
Historical			
Interest expense (\$ million)	\$ 446.06		
Total debt (\$ million)	\$ 7,346.44		
Cost of debt	6.07%		
Credit Spread			
Risk free rate	2.30%		
Country default spread	0.00%	Damodaran (2022)	
Interest coverage ratio	38.29		
Synthetic rating	Aaa/AAA	Damodaran (2022)	
Company default spread	0.69%	Damodaran (2022)	
Cost of debt	2.99%		

## Appendix 31: Cost of Equity Estimation

Cost of Equity Estimate			
		Source	Comments
CAPM			
Risk free rate	2.30%		
Beta	1.20		
ERP	5.80%		
Cost of equity	9.27%		
CAPM (Unlevered)			
Risk free rate	2.30%		
Unlevered beta	0.89		
ERP	6.01%		
Unlevered cost of equity	7.64%		

## Appendix 32: WACC Estimation

WACC	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
D/E	30.67%	37.14%	45.58%	53.48%	62.99%	73.51%	73.51%
<b>Cost of Equity</b>							
Rf	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
$\beta_U$	0.89	0.89	0.89	0.89	0.89	0.89	0.89
$\beta_L$	1.15	1.20	1.27	1.34	1.42	1.51	1.51
MRP	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%
CRP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Re	8.96%	9.27%	9.68%	10.07%	10.54%	11.05%	11.05%
<b>Cost of Debt</b>							
Rd	6.02%	6.07%	6.02%	5.95%	5.78%	5.97%	5.97%
Tc	5.16%	5.16%	5.16%	5.16%	5.16%	5.16%	5.16%
After-tax Rd	5.71%	5.76%	5.71%	5.64%	5.48%	5.66%	5.66%
<b>WACC</b>							
We	76.53%	72.92%	68.69%	65.15%	61.35%	57.63%	57.63%
Wd	23.47%	27.08%	31.31%	34.85%	38.65%	42.37%	42.37%
WACC	8.19%	8.32%	8.44%	8.53%	8.58%	8.77%	8.77%

## Appendix 33: Growth Rate Estimation

Growth Rate Assumptions							
Macroeconomic							
	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
Global Real GDP	3.0%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Global inflation	6.5%	4.1%	2.4%	2.4%	2.4%	2.4%	2.4%
Maritime shipping market							
	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
World seaborne trade	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Stable Growth Model: (g = reinvestment rate x ROE)							
Year	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
Reinvestment Rate							
Capex	2511.9	2224.8	1767.2	2200.4	2077.0	2145.1	2154.4
D&A	1406.0	1459.4	1468.2	1470.2	1512.3	1566.2	1480.4
ΔNWC	388.8	-718.2	-477.6	-140.9	28.1	81.4	-139.7
EBIT (1-t)	9412.8	4664.8	2187.0	1552.4	1676.5	1925.5	3569.8
Reinvestment Rate	15.9%	1.0%	-8%	38.0%	35.4%	34.3%	15.0%
Return on Equity							
EBIT (1-t)	9412.8	4664.8	2187.0	1552.4	1676.5	1925.5	3569.8
Total Assets	29276.2	32050.5	32867.6	32921.6	33123.1	33453.5	32282.1
ROA	32.15%	14.55%	6.65%	4.72%	5.06%	5.76%	11.06%
D/E	30.67%	37.14%	45.58%	53.48%	62.99%	73.51%	73.51%
Cost of debt	6.02%	6.07%	6.02%	5.95%	5.78%	5.97%	5.97%
Taxes	5.16%	5.16%	5.16%	5.16%	5.16%	5.16%	5.16%
ROE	40.26%	17.82%	7.08%	4.22%	4.80%	5.83%	15.03%
Growth Rate	6.39%	0.18%	-0.58%	1.60%	1.70%	2.00%	2.25%
Dividend Sustainable Growth Rate: (g = b x ROE)							
Year	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
Net Income	9113.31	4265.53	1712.43	1028.54	1103.99	1267.24	18491.04
Dividends	6561.59	3199.15	2449.08	2013.68	2010.69	2097.73	18331.90
Equity	18714.73	19781.11	19044.46	18059.32	17152.62	16322.13	109074.38
ROE	48.70%	21.56%	8.99%	5.70%	6.44%	7.76%	16.95%
Rentention rate	28.0%	25.0%	25.0%	25.0%	25.0%	25.0%	0.9%
Div. growth rate	13.63%	5.39%	2.25%	1.42%	1.61%	1.94%	0.15%
Fisher Formular: $g=(1+gdp)*(1+r)-1$							
Year	2022F	2023F	2024F	2025F	2026F	2027F	Terminal
Real GDP Growth	3.00%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%
Inflation	6.50%	4.10%	2.40%	2.40%	2.40%	2.40%	2.40%
Growth Rate	9.69%	6.81%	5.06%	5.06%	5.06%	5.06%	5.06%

## Appendix 34: WACC Method

FCFF	2023F	2024F	2025F	2026F	2027F	Terminal
EBIT	4918.71	2305.99	1636.85	1767.78	2030.24	2075.90
EBIT*(1- Tc)	4664.84	2186.98	1552.37	1676.54	1925.45	1968.76
CAPEX	2224.84	1767.19	2200.36	2076.97	2145.08	2145.08
D&A	1459.37	1468.16	1470.22	1512.29	1566.21	2145.08
NWC	-718.17	-477.62	-140.88	28.10	81.41	81.41
FCFF	4617.54	2365.56	963.11	1083.76	1265.17	2059.03
PV of FCFF	32617.24	30362.76	30384.29	31946.34	33568.14	32302.96

Price Target	2023F
Shares Outstanding/m	175.76
Enterprise Value	32617.24
+Cash	11647.57
-Debt MV	7346.44
+Non operating assets	26.00
-Non operating liabilities	67.00
-Minority Interest	34.69
-Pension Liabilities	312.00
Equity Value	36530.68
Target Price	207.84
Price on 2022-12-30	177.60
Upside Potential	17.03%

## Appendix 35: Flow-to-Equity Method

FTE Model						
FTE	2023F	2024F	2025F	2026F	2027F	Terminal
FCFF	4617.54	2365.56	963.11	1083.76	1265.17	2059.03
Interest after tax	399.31	474.55	523.83	572.55	658.22	673.02
Net borrowing	1606.70	1333.24	978.60	1145.52	1195.23	1222.11
FTE	5824.93	3224.26	1417.88	1656.73	1802.19	2785.20
Cost of Equity	9.27%	9.68%	10.07%	10.54%	11.05%	11.05%
PV of FTE	34640.6	31487.2	31000.0	32561.1	34160.3	32358.07

Price Target	2023F
Shares Outstanding/m	175.76
Minority Interest	34.69
Equity Value	34605.87
Target Price	196.89
Price on 2022-12-30	177.60
Upside Potential	10.86%

## Appendix 36: Adjusted Present Value Method

APV Model						
APV	2023F	2024F	2025F	2026F	2027F	Terminal
FCFF	4617.54	2365.56	963.11	1083.76	1265.17	2059.03
Unlevered cost of capital	8.40%	8.54%	8.63%	8.70%	8.90%	8.90%
Unlevered value of firm	32170.83	29869.12	29851.50	31382.36	32934.00	31668.82
Total debt	7346.44	8679.68	9658.28	10803.81	11999.04	11999.04
Interest expense	446.06	522.51	574.23	624.61	716.13	716.13
Tax shield	23.02	26.97	29.64	32.24	36.96	36.96
PV(Tax Shield)	937.43	969.93	999.73	1027.77	1053.08	1016.12
Price Target	2023F					
Shares Outstanding/m	175.76					
Enterprise Value	33108.26					
+Cash	11647.57					
-Debt MV	7346.44					
+Non operating assets	26.00					
-Non operating liabilities	67.00					
-Minority Interest	34.69					
-Pension Liabilities	312.00					
Equity Value	37021.69					
Target Price	210.64					
Price on 2022-12-30	177.60					
Upside Potential	18.60%					

## Appendix 37: Dividend Discount Method

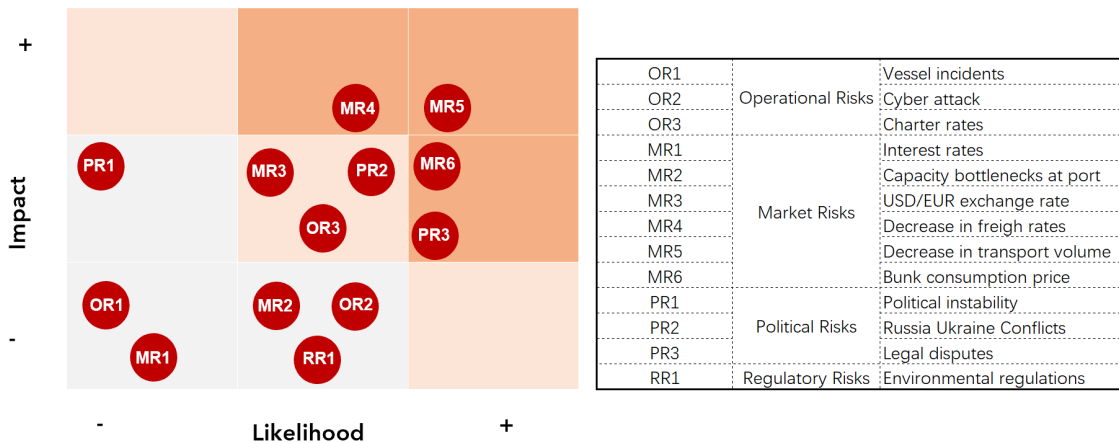
DDM Model						
DDM	2023F	2024F	2025F	2026F	2027F	Terminal
Net Income	4265.53	1712.43	1028.54	1103.99	1267.24	18491.04
Dividends	3199.15	2449.08	2013.68	2010.69	2097.73	18331.90
Equity	19781.11	19044.46	18059.32	17152.62	16322.13	109074.38
ROE	21.56%	8.99%	5.70%	6.44%	7.76%	16.95%
Retention rate	25.0%	25.0%	25.0%	25.0%	25.0%	0.9%
Div. growth rate	5.39%	2.25%	1.42%	1.61%	1.94%	0.15%
Dividend	3199.15	2449.08	2013.68	2010.69	2097.73	3055.32
Re	9.27%	9.68%	10.07%	10.54%	11.05%	11.05%
Equity Value	34425.53	34121.51	34739.58	36021.56	37594.00	35496.27
Price Target	2023F					
Shares Outstanding/m	175.76					
Equity Value	34425.53					
Target Price	195.87					
Price on 2022-12-30	177.60					
Upside Potential	10.29%					



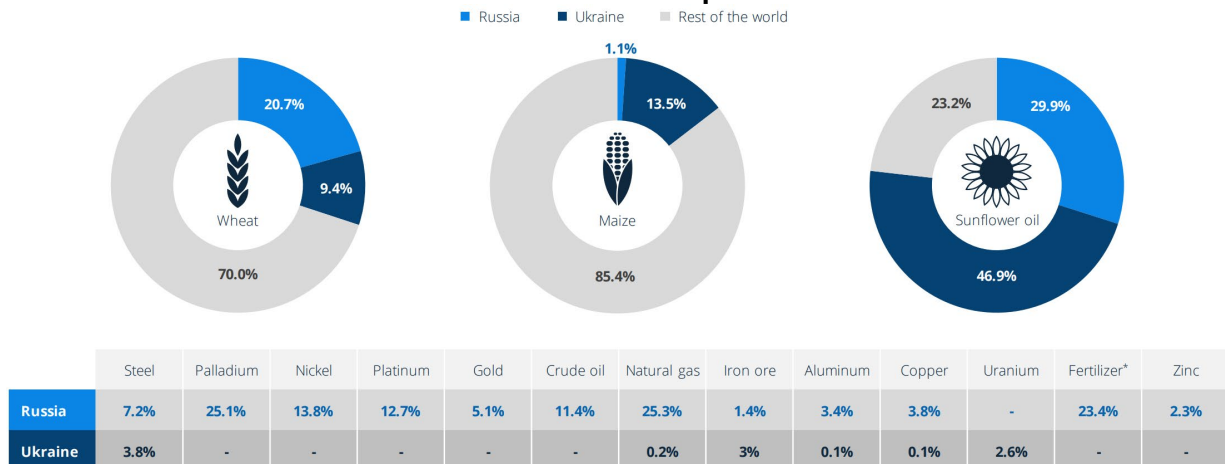
## Appendix 38: Multiples Valuation

Enterprise Value Multiples		
		2023F
Shares Outstanding/m		175.76
1	<b>EV/EBITDA</b>	
	Peers average	4.4
	EBITDA	6,378.1
	<b>Enterprise Value</b>	<b>28,012.5</b>
	+Cash	11,647.6
	-Debt MV	7,346.4
	+Non operating assets	26.0
	-Non operating liabilities	67.0
	-Minority Interest	34.7
	-Pension Liabilities	312.0
	Equity Value	31,926.0
	<b>Target Price</b>	<b>181.65</b>
2	<b>EV/Sales</b>	
	Peers average	2.40
	Sales	21,485.7
	<b>Enterprise Value</b>	<b>51,651.6</b>
	+Cash	11,647.6
	-Debt MV	7,346.4
	+Non operating assets	26.0
	-Non operating liabilities	67.0
	-Minority Interest	34.7
	-Pension Liabilities	312.0
	Equity Value	55,565.0
	<b>Target Price</b>	<b>316.1</b>
3	<b>Price Multiples</b>	
		2023F
Shares Outstanding/m		175.76
<b>P/E</b>		
	Peers average	4.15
	Net income	4,265.5
	Equity Value	17,710.5
	<b>Target Price</b>	<b>100.8</b>
<b>Average</b>		<b>199.5</b>

## Appendix 39: Risk matrix



## Appendix 40: Share of Russia and Ukraine in world exports of selected commodities in 2020



Source: Statista

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### Recommendation System

Level of Risk	SELL	REDUCE	HOLD/NEUTRAL	BUY	STRONG BUY
High Risk	0%≤	>0% & ≤10%	>10% & ≤20%	>20% & ≤45%	>45%
Medium Risk	-5%≤	>-5% & ≤5%	>5% & ≤15%	>15% & ≤30%	>30%
Low Risk	-10%≤	>-10% & ≤0%	>0% & ≤10%	>10% & ≤20%	>20%