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New Insights into the Ferry Business in the Turbulent Environment

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Abstract:

Purpose: *The purpose of the article is to analyse the challenges faced by the ferry operators and discuss what activities they take when operating in a turbulent environment resulted from COVID-19 pandemic and effects of economic situation of the Baltic States.*
Design/Methodology/Approach: *Several research methods were applied, literature review, data exploration method, desk research and in-depth interviews.*
Findings: *Research revealed lack of current publications on ferry business activity in the context of dynamic and changing drivers influencing the ferry shipowners during last three years.*
Practical Implications: *The article emphasizes that the activities undertaken by the ferry operators allow to operate despite the negative external factors and what should be undertaken to minimalize the adverse effects.*
Originality/Value: *The literature researching the ferry shipping is not extensive, it includes a relatively small number of scientific articles and monographs. Most of the research concerns the last decade. However, there are no current studies on the functioning of the ferry sector, the activity of which in the last three years was significantly influenced by changes that occurred in the external environment. The article fills the research gap in the ferry sector studies.*

Keywords: *Baltic Sea Region, ferry shipping, drivers influencing the ferry operation.*

JEL classification: *M21, L99, L83, C38.*

Paper Type: *Research article.*

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1. Introduction

Ferry shipping is well developed in many regions of the world. Europe is an area of high concentration of ferry industry with the Baltic Sea being one of the prime ferry markets (Kizielewicz and Urbanyi-Popiołek, 2015).

In the literature and in practice, there is no uniform definition of ferry shipping and ferry vessel which results from permanent changes of this type of vessel as well as approach of the researchers and practitioners to the fleet operation.

However carriage of passengers and cargo by one ship using ro-ro technology for loading and discharging lorries, trailers and private cars is the prime characteristic of this shipping segment. Ferry operation is therefore defined as a type of the liner shipping where passengers and cargo form one market. Ferries ply the regular routes, usually between two or three ports according to schedules (Urbanyi-Popiołek, 2009).

Similar approach to the ferry business presents Stapford, who states that ferries transport people, goods and vehicles over short distances by sea (Stopford, 2009). Kotowska also highlights the transportation of the two segments, passengers and cargo (Kotowska, 2014). The Swedish ShipPax, the leading ferry consulting and information provider, define ferry as a ship larger than 1000 GT that sails on a regular line and has passenger accommodation and is using ro-ro technology for the transportation of cars and commercial vehicles (if any), having sufficient free height on car deck(s) for this (ShippaxMarket12, 2012).

The most authors focus either on cargo or passenger segment in their studies. Musso, Paixao and Marlow define ferry shipping as a segment of short sea shipping and emphasise that these connections are an element of road –sea transport system between continental Europe and the Nordic countries (Musso *et al.,* 2010). Ferry business constitutes prime element of the regional transport chains and multimodal transport systems (Paixao Casaca and Marlow, 2009; Daduna *et al.,* 2012, Urbanyi-Popiołek, 2018).

Ferry connections are also regarded as an alternative for the land transportation in the context of sustainable transport development (Castels *et al.,* 2012; Kotowska, 2015; Chen *et al.,* 2014). The growth of the ferry turnover as an alternative for road haulage is primarily aimed at discerning social benefits resulting from lower external costs generated in maritime transport, lower number of accidents and reduced congestion (Kotowska, 2015).

The concept of carriage of valuable goods is based on house to house formula. Such merchandises generally are loaded into trucks in sender premises and unloaded in receiver places. The ferry services link the continental Europe transport system with Scandinavian roads. This maritime transport enables efficient and effective carriage of goods transported in lorries and trucks via the Baltic Sea (Urbanyi-Popiołek, 2020).

Passenger transport is the second segment of ferry industry and is usually analysed in terms of tourism functions of ferry shipping (Wild and Dearing, 2000; Kizielewicz and Urbanyi-Popiołek, 2015). Important for this segment are the factors that influence the passenger to select a ferry operator and states that ferry passengers form satisfaction perceptions on the basis of their evaluation of four primary dimensions: service quality, price, convenience and availability (Pantouvakis, 2007).

The passenger demand is created by people travelling in different purposes, e.g. visit a selected destination, holidays trips where the ferry is part of the journey, participation in package trips, shopping or business voyages The passengers can be segmented as follows (Kizielewicz and Urbanyi-Popiołek, 2015):

- Liner passengers – travellers taking a trip in various reasons (visit an interesting destination, participation in culture or sport event, visit relatives etc.), ferry crossing is only a part of whole trip,
- Cruise passengers – travellers participating in package trips of diverse nature, e.g., round trips for pleasure, trips with short stay in port of destination etc.,
- Conference passengers – participants in conferences and seminars organized on-board within liner trips,
- Shopping passengers – people who travel to purchase commodities on-board or in port of destination,
- Business passengers – passengers travelling in connection with their professional activities, in this category lorry drivers are included.

In practice, assigning the travellers to given category is not clear because passengers travelling e.g., as conference participants also do some shopping and enjoy entertainment. The assignment of the traveller to a given segment results from the main transport need (Urbanyi-Popiołek, 2018).

2. Research Methodology

The literature researching the ferry industry is not extensive, it includes a relatively small number of scientific articles and monographs. Most of the research concers the last decade. However, there are no current studies on the functioning of the ferry sector, the activity of which in the last three years was significantly influenced by changes that occurred in the external environment.

Firstly the COVID-19 pandemic triggered a slowdown in economic activity, determined by a lockdown and broken regional supply chains, which in turn resulted in a decrease in the demand for cargo transport in the Baltic Sea Region. The ferry tourist traffic has been interrupted as well. The war in Ukraine comes as another shock to the current situation. The effects can be felt all over the world, including Europe.

The prime aim of the paper is to analyse the challenges faced by the ferry carriers and discuss what actions they take when operating in a turbulent environment. The purpose of the analysis is to fill the research gap in the ferry sector studies. The research questions have been formulated as follows:

RQ1: How shocks in the external environment affected the passenger and cargo segments of ferry business?
RQ2: What actions have been undertaken by shipowners adapting to changes in the environment?

In order to achieve goals and answer the research questions, the following research methods were used, literature review, data exploration method, desk research and in-depth interviews. Data exploration and desk research were based on the original data collected from the ShipPax Information, a publisher of ferry reports and provider of consulting services for the ferry and ro-ro shipping industry, as well as from year and interim half year reports of ferry operators.

The data base of Sweden Statistics were also explored. The analysis of the number of ferries, services and operators as well as cargo and passenger traffic was performed in this first stage of research process. At the next stage in-depth interviews with selected representatives of ferry operators were conducted. The interviews were carried out with three shipowners, one of them was a carrier specializing in ferry tourism.

The two others are shipowners, with a predominance of transport in the cargo segment. Such a selection of representatives is caused by the differences in the challenges faced by carriers with an advantage of services in the passenger segment compared to those specializing in the cargo segment.

3. Data Analysis

The Baltic Sea constitutes the prime ferry market in Europe. As of September 15, 2022, 18 carriers operate on this market, serving international routes and main cabotage lines, the latter important in terms of the international cargo and passenger transport. Shipowners operate 112 ferries of various types – ro-pax, cruise ferries and hight-speed vessels (ShippaxMarket22, 2022).

There is a visible concentration of the supply on the Baltic market. In terms of the transport capacity, as well as the market share, the following operators dominate the market: Stena Line, Finnlines, TT-Line, DFDS Seaways, Tallink/Silja Line, Unity Line, Viking Line (Table 1).

Table 1. *Summary of basic data on selected ferry operators.*

Operator	No of ferries		Pax capacity (No.)		Line metre (m)	
	2016	2022	2016	2022	2016	2022
Stena Line	17	17	16 984	16 616	36 869	42 086
DFDS Seaways	9	8	8 229	7 442	16 991	21 301
Tallink Group	11	12	29 695	30 534	17 483	20 635
Viking Line	7	7	16 790	17 260	6 530	7 055
TT-Line	6	8	3 020	4 035	14 454	21 250
Scandlines	10	7	11 370	7 280	6 157	6 235
Finnlines	7	8	3 196	3 730	25 878	30 274
Unity Line	7	7	2 679	2 789	11 923	12 420

Source: *Own elaboration based on ShippaxMarket 16, Shippa Market 22.*

Submarkets in the Baltic Sea differ in the demand for transport services and the functions that ferry lines perform. In the West and South Baltic cargo traffic dominates. Both submarkets accounts for 81% of number of the cargo units (lorries and semitrailers) transported by the ferries in the region. Most services are freight oriented routes. These lines are maritime parts of the regional supply chains between continental Europe and Scandinavia. The exception are services from Norway to Sweden, Denmark and Germany, where passengers traffic dominates due to tax-free sales and cruise trips offers.

The Eastern Baltic differs from the former submarkets. It is characterized by the high concentration of ferry tourism. Mini cruises are very popular among the Scandinavians. For many decades the Swedes and Finns have undertaken ferry trips due to the possibility of making purchases in the duty-free zone, which is still preserved in this area (lines via the Aland Islands). Moreover, the purpose of the trip are the attractions on the ship. Ferry cruises are a way of life for many people in the Nordic countries. A few lines in this part of the Baltic Sea are cargo oriented only, e.g., Stena Lines services from Norvik to Hanko and Venspils.

Operating on individual markets, shipowners utilize a fleet of ferries adapted to the specificity of the markets and offer services tailored to the transport needs of the customers. On cargo oriented services the typical type of the ship is a ro-pax ferry with larger space for cargo and limited passenger facilities. In contrast, on lines where passenger traffic dominates, cruise ferries with a large passenger space and much smaller cargo capacity are operated.

Tallink/Silja Line and Viking Line are the examples of carriers utilize cruise ferries on passenger oriented lines in the East Baltic. Tallink Group operates 12 vessels, most of them with passenger capacity over 2,500 people. The operator dominates in terms of transport capacity, at one time offers 30,500 places on board for passengers, most in cabins. The latter, Viking Line is the second in BSR with 7 cruise ferries and total capacity of 16,790 passengers. The carriers operate the lines between Finland, Sweden and Estonia. Before the pandemic time, the passenger traffic on the East Baltic submarket amounted to 15 -16 million every year (ShippaxMarket20, 2020).

TT-Line, Finnlines, Unity Line, DFDS Seaways are carriers operating more cargo oriented services among others. Considering the cargo capacity, the market is dominated by two operators: Stena Line and Finnlines. The former operates 17 ferries in the Baltic Sea Region on 8 services from Sweden and Germany to Denmark, Poland, Lithuania, Latvia and Finland.

The loading line of the company's ferries is in the range of 1,500 - 3,600 metres. The latter shipowner utilize 8 ro-paxes of the line meter over 3,000 metres. The next, German TT-Line operates 8 ferries, each with the loading line over 2,200 metres.

Changes in the market environment had a significant impact on the ferry traffic. The first negative factor was the outbreak of the pandemic COVID-19. All countries in the Baltic Sea Region had taken far-reaching measures which had directly influenced the ferry business. Borders were closed and the Baltic states introduced entry restrictions.

Furthermore the countries were placed in lockdown. The new situation has strongly affected the sector, however the negative impact on both segments differed. Table 2 presents the ferry traffic of the selected markets and reflects the situation of the business.

Passenger traffic decreased from 50 to 70% in 2020 compared with the same period of 2019. In 2021 this segment started to recover, however the volumes has not reach pre-pandemic levels. The figures for the first half of 2022 are at a similar level compared to the same period of the previous year. The impact of the pandemic on passenger volumes is expected to be felt by 2025.

The economic downturn in the Baltic States has undoubtedly affected trade in the region, but the need to ensure supply has allowed to continue the operation. The ferry connections from Germany, Poland, Lithuania to Denmark and Sweden are important elements of the regional supply chains between continental Europe and Scandinavia.

However the slowdown resulted in drop in cargo traffic in this area by an average10%. In addition, the recession and conflict in Ukraine affected the turnover of some lines. Services from Germany to Lithuania and Latvia recorded a decrease of 20% and 10% respectively in the first half of 2022. Similar decreases were recorded by lines to Swedish ports from the Baltic States. This decline was caused by the sanctions imposed on Russia and Belarus, which reduced the transit turnover of these countries served by the ports of Klaipeda, Liepaja and Venspils.

Table 2. *Passenger and cargo traffic – selected markets*

	Passengers			**Cargo**		
	2019	**2020**	**2021**	**2019**	**2020**	**2021**
Germany Sweden	1,886,369	1,212,518	1,556,102	814,150	794,356	890416
Poland – Sweden	1,466,504	928,012	1,296,522	825,044	778,399	864,451
Lithuania-Sweden	171,685	164,787	189,778	84,142	94,797	95,021
Germany Denmark	6,867,000	3,107,000	3,630,000	679,036	641,398	719,990
Finland - Sweden	7,323,789	2393,872	4,866,163	212,035	195,781	200,133
Finland – Estonia	7,076,791	3,180,444	2,355,180	342,142	298,481	349,603
Germany Finland	2180,19	107,849	135,549	738,000	723,000	785,000

Source: *Own elaboration based on Shippax Market19, Shippax Market21, ShippaxMarket22.*

4. Discussion

There are multiple factors influence the operation of the ferry industry. Besides pandemic, the business has been affected by rampant inflation, high fuel costs and a war in Ukraine, among others. On the whole, passenger-focused operators face more uncertainties than freight oriented ones, as travelling public are now spooked by the war and pandemic.

Macroeconomic development, including the GDP and inflation, plays a significant role in the activity of the ferry business. It is predicted than in the eurozone countries the GDP will decline in late 2022 and in 2023 as households and businesses contend with soaring energy bills and potential energy disruptions (Reinikainen, 2022).

European countries have been affected by inflation. In July this year, the harmonized index of consumer prices in the eurozone reached level of 8.9%. The price increases are driven mainly by the rising prices of energy, fuels and food. High rates are reported by the Baltic countries, including Germany, Austria, the Czech Republic, Hungary and Poland. The cost-off living crisis, fuelled mainly by surging energy costs, has led to level of inflation in Europe last seen in early 1980s. Household consumption accounted for 51% of the GDP in eurozone, 43% in Sweden and 51% in Finland.

Analysing the trade exchange of these countries with Sweden and Finland, provided for the first half of 2022 by the SCB, no decrease in mutual turnover was visible. In second half of this year a slight drop in exchange has been occurred. This is reflected in orders for the transport of cargo carried out by forwarders serving the Scandinavian market. However, the recession is expected to have a negative impact on household spendings. As ferries mainly carry finished goods, components and other high value cargoes, a recession will probably cause decline in freight volumes.

Regarding passenger traffic, there is now also a new determinant of passenger volumes. Many people have changed their working and leisure habits during pandemic. There are less commuters onboard as many people have the option of working from home. Conversely the growing online shopping habits may drive the ferry freight volumes, which will compensate the loss of passenger-related revenues. In other words, the divergence of freight and passenger will become even more stark, with freight focused companies like DFDS, TT-Line or Finnlines, performing even better than the likes of Viking Line or Tallink in the coming years (ShippaxMarket22, 2022).

The presented conditions pose challenges to the shipowners and the necessity to adapt to the turbulent and unpredictable environment. The companies are forced to undertake actions to minimalize the negative effects influencing the fleet operation.
The passenger oriented operators have made the reorganisation of their networks, as well as offered new summer cruise destinations to attract new customers. The latter are e.g. Helsinki – Riga, Stockholm – Visby, Tallinn – Turku, Stockholm – Ystad or Tallinn – Marienhamn – Turku.

The next step of the shipowners operating in this segment is fleet operation. The decrease in the demand for ferry tourism resulted in the lack of possibility of effective use of the cruise ferries in the Baltic Sea. Tallink Group started to charter out ships. The examples, among others are as follows. Two sister ferries Victoria I and Romantika were chartered by the Moroccan company Tanger MED Port Authority for the summer season 2021.

These units, during a three-month time-charter, served connections between Morocco and French and Italian ports. The other was Silja Europa chartered to handle the COP26 climate conference in Scotland. During the month-long charter, the ship served as a hotel accommodation for the conference participants. The same ferry and the other Galaxy have been chartered since summer 2022 to the Netherlands to accommodate the Ukrainian refugees. In the same time, the other cruise company, Viking Line sold its two cruise ferries to Mediterranean operator.

The freight-oriented companies also reorganized their services. On connections that have been affected by traffic drops, the frequency of departures has been reduced. These measures were taken primarily on the lines from Germany and Sweden to Lithuania and Latvia.

The next activity underlines by the companies representatives is the cost management. Fuel prices are the most significant. High fuel prices have been the major problem for the ferry industry since Ukraine – Russia conflict started. Despite the price of Brend crude oil dropped from USD 125 per barrel to 85 USD in September, the weakness of European currencies in which ferry companies in the region have their incomes, influence the operating costs.

As reported by the carriers, the fuel costs in 2022 account for 70% of their operating expenses, compared to 40% of the previous year. Much higher are prices of LNG fuel. To lower the fuel expenses the shipowners swich to oil bunker, as many ferries have duel – fuel engines that allows such a swich. Another action taken by carriers is speed reduction, which results in lower fuel consumption and lower the costs. However, this action increases the transit time, which is inconvenient for the customers, mainly for the hauliers.

The reduction of the employment on board and ashore is the next activity in the cost management. It is estimated that the crew costs of ro-pax and cruise ferry have a 20% and 25% share respectively in the operating costs of the vessel. This action resulted in average 15 % decline of costs, depending of the carrier.

Moreover, after years of falling, the debt levels of many ferry companies are again rising. Viking Line`s long term dept almost doubled between 2020 and 2021 because of arrival of its latest newbuilding, the Viking Grace in 2013, took many years to pay down. Tallink and Finnlines are both expecting newbuilds in 2023. DFDS just had two newbuilds delivered this year. The industry`s long term dept levels will increaser in 2023 and 2024 thus the costs of servicing them will also rise (Reinikainen, 2022).

The representatives of the operators indicate that to compensate at least some of the costs, shipowners were forced to rise the tickets fees and freight rates. The latter increased by an average of 10%. The tariff rates on long-distance lines like Finland - Germany and on services with the highest cargo traffic like German – Sweden, Poland – Sweden were increases by 15%.

Moreover the freight surcharges to basic rates went up. Shipowners raised the bunker surcharge (BAF) and low sulphur charge (LSC) by approximately 5% the most due to fuels prices. Another arbitraries charge by the ferry companies are currency adjustment factor (CAF) and a new one - operational cost recovery (OCR). The latter has recently been introduced to compensate for other operating costs.

The passenger fares for travel and cabin accommodation has increased by an average of 15%. To make the cruise trips more attractive, shipowners of passenger-oriented ferries have diversified the packages to a greater extent and made it possible to choose services according to the passenger's financial possibilities.

5. Conclusions

The COVID-19 pandemic and macroeconomic situation has strongly affected the ferry industry. The passenger sector was hit deeply due to restrictions in traveling, however cargo freight also dropped as the economy slow down. Economic development, including the GDP and inflation play the prime role in the activity of the ferry business. Moreover, to combat this, the central banks have been increasing the interest rates, which affects ferry operators, people and companies whose cargoes ferries transport.

The shipowners has undertaken several activities to adapt to the new market conditions studied in the article. As the volumes and rates fluctuate greatly, cost management has become the prime activity of the shipowners.

Should the peak of the inflation occur in the beginning of 2023, the next year could be more decent for the Baltic companies. It is estimated that passenger traffic may start to increase during summer, when evidence of improving economic outlook might encourage people to book holiday trips. This would also benefit the cargo segment, as the mutual trade turnover within the region is strong and freight traffic will stabilize.

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