Comparative analysis of tariff models in RO-RO transport in Croatia, Italy and Greece

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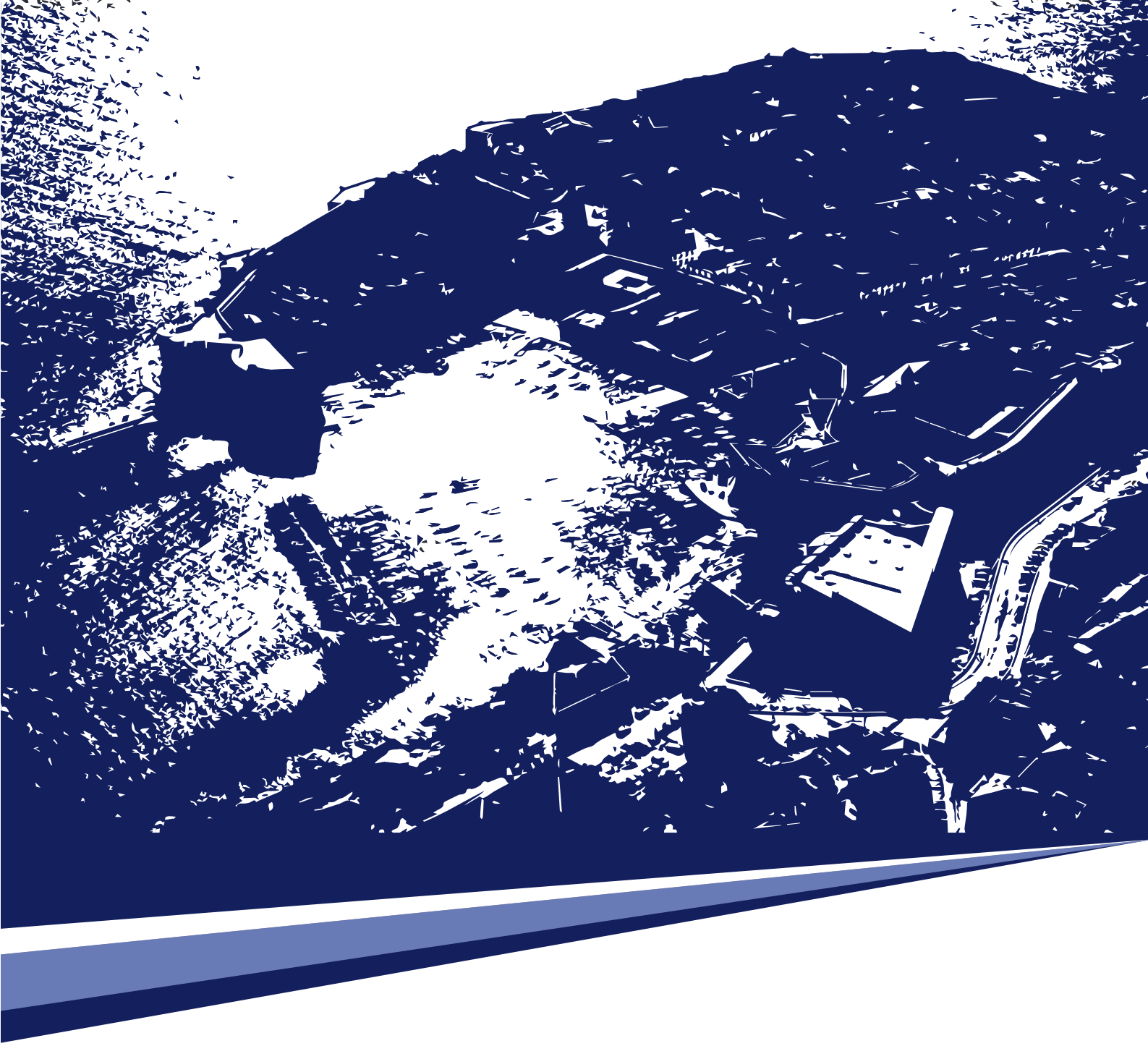

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CONTENT

COMPARATIVE ANALYSIS OF TARIFF MODELS IN RO-RO TRANSPORT IN CROATIA, ITALY AND GREECE

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Summary

Coastal liner passenger transport in the Republic of Croatia is the main means of connecting the islands with the mainland and the islands with each other, ensuring the basic living conditions of the inhabitants, promoting their mobility, reducing social and economic inequalities and increasing the sustainability of the islands. Due to their complexity, their extremely seasonal nature and their economic activity of public interest, maritime connections are regulated by numerous legal acts, but the way in which tariffs are set has not yet been systematically defined. In Greece and Italy, ticket prices and categories of passengers and vehicles are related to the pricing policy of the ferry operator, while in Croatia the national government is involved in the formation of ticket prices and privileged groups. The aim of this article is to analyze the categories and the way of setting tariffs for passengers and vehicles in ferry coastal passenger transport in Croatia and to compare them with those in Greece and Italy. The analysis was carried out on the example of the Jadrolinija shipping company, which is the dominant ferry operator in Croatia. The research shows that Italian and Greek operators have a larger number of categories for passengers and vehicles and have a different way of setting tariffs for these groups than in Croatia. Based on a comparative analysis of the tariff models applied in Italy and Greece, this paper proposes a modification of the existing tariffs applied in the coastal liner passenger transport of Croatia.

Keywords: tariff models, RO-RO transport, organization, Mediterranean, passengers

1. INTRODUCTION

Coastal line passenger transport is of extraordinary importance for the economy of the Republic of Croatia. It is a method of transporting passengers and goods according to a predetermined and published timetable between the port of departure and the port of destination. In addition, coastline transport in the Republic of Croatia remains the essential means of connecting the mainland and the islands. All services are publicly available to potential users of this form of transport and to potential business partners. Public maritime transport is provided by carriers that have concluded a public service contract for a specific line, i.e. for a group of lines, if there are economic, demographic or other important reasons for doing so [1], [2].

In line with the Law on public transport in liner shipping and occasional coastal maritime traffic in the Republic of Croatia, a public transport system should be established to ensure regular connection of the inhabited islands with the mainland and the inhabited islands with a sufficient number of daily connections in both directions, in order to create better living conditions on the islands and promote their sustainable development[3]. For this reason, more investment is needed in the modernization of more suitable liner passenger vessels for carrying out the service in difficult winter sailing conditions [4]. In addition, the extension of the tourist season would lead to a higher demand for coastal liner services and an increase in profitability on certain lines [5].

The establishment of a public transport system is based on the principles:[3]

- promotion of the economic development of the island,
- continuity and regularity of service with vessels of a certain capacity and type, and ensuring adequate quality of service,
- transport services with fixed prices and other conditions
- support for shipowners, without which the continuity and regularity of public transport on certain routes cannot be guaranteed
- adapting public transport to actual needs,
- provision of additional transport services.

The general provisions of the Law on public transport in liner shipping and occasional coastal maritime traffic in the Republic of Croatia regulate the conditions and manner of providing public transport services of general economic interest. In accordance with the Law the types of lines are defined, as well as the establishment and harmonization of timetables, price lists of services, provision of funds for continuous and regular public transport. In the same Act, liner public transport is determined as the transport of passengers, goods and vehicles in the internal maritime waters and the territorial sea of the Republic of Croatia, carried out on predetermined routes in conformity with publicly announced timetables and price lists.

Based on the importance of the route, the lines on which public transport is carried out are divided into: national, local and international lines. According to the type of transport they are divided into: Ferries (RO - RO), high-speed and classic ship lines [3]. In order to analyze the way of tariff setting, only data related to national ferry lines will be considered in the following chapters. In Croatia, RO -RO are passenger ships that allow people to drive their own vehicles the whole trip along the coast. This is evident in the synergy and link with road transport, which is without a doubt one of the most essential modes of transportation. The analysis is predominantly based on the most recent present data wherever possible and appropriate. Where new data were not available, the most recent sources available were used. For those analyzes where it was necessary to aggregate data, the aggregation of data was done through consultation with several experts or institutions in the field. For example, institutions in Greece and Italy were also contacted for the purpose of comparing tariffs.

In this paper, authors will analyze in detail the tariffs and possibilities of tariff design for RO - RO lines with a particular focus on Greece and Italy. The aim is to emphasize the possible need for correction of the tariff model applied in the Republic of Croatia, as well as other anomalies resulting from the above analysis. A proposal has been brought forward to modify the tariff model in the coastal liner passenger transport in the Republic of Croatia for the RO - RO lines. It should be emphasized that a possible proposal to increase fares will not apply to island residents, more precisely to persons with an island card, but only to tourists and their means of transport, as well as to other visitors to the islands.

This paper consists of five parts. After the introduction, the second part of the paper presents the role of tariffs in costal liner passenger transport. The third part analyses tariffs and methods of defining tariffs for ferry lines in costal liner passenger transport in the Republic of Croatia. In fourth part of the paper Croatian sea passenger transport is compared with other European countries and analyses tariffs in Italy and Greece, leading countries in terms of maritime passenger transport in the EU. Fifth part discusses the results of the research and provides the main conclusions and recommendations resulting from the analysis.

2. THE ROLE OF TARIFFS IN COASTAL LINER PASSENGER TRANSPORT

The term tariff, in the narrowest sense of the word, means price, that is, a systematic review of certain pecuniary benefits. Tariffs include specific legal rules, criteria and circumstances for operationalizing transport services, which, in addition to pricing the transport service, relate to specific transport behaviors reflected in the value [6].

According to Zelenika, tariffs serve to inform interested parties about prices in maritime transport [7]. Tariffs, when published, help customers to calculate the cost of travel in advance, but they usually do not affect the volume of demand. Tariffs are suitable for recurring shipments, certain lines, selected commodities, and certain types of transportation. The advantage of the tariff is its simplicity, since the customer can estimate the cost of transportation based on a specific method [8]..In liner shipping, the carrier sets the line tariff for each line separately and very often for each direction of travel, which depends on the structure of the cargo received for transportation on each line or direction of travel [9].

When forming the tariff, it is important to consider all the parameters that are crucial for its formation. These include the following parameters: Transport price, transport conditions and prices for additional services (e.g. weighing, loading and unloading, transshipment, storage of goods, empty runs...). Tariffs differ according to the object of transport, therefore, they are divided into passenger tariffs and freight tariffs, both of which have their own subcategories. The tariff, as a published list of prices and conditions for maritime transport, is a means by which all interested parties can inform themselves about the services offered by a shipping company. This applies to liner passenger shipping and liner cargo shipping, and to some extent to tanker shipping, while the contract for free shipping rates and conditions is a matter of agreement between the carrier and the customer [7].

3. ANALYSIS OF TARIFFS AND METHODS OF DEFINING TARIFFS FOR FERRY LINES IN COASTAL LINER PASSENGER TRANSPORT IN THE REPUBLIC OF CROATIA

For the Republic of Croatia, which has a highly indented coastline and many inhabited islands, passenger transport is of significant importance, as it is maintained with the aim of achieving a higher standard of living for the local population, better island accessibility and greater sustainability of the islands. Passenger transport is provided on fixed routes, on which the price, offer, travel conditions and discounts are indicated, and passengers cannot plead ignorance of travel conditions or prices, as they can access them at any time. Considering that the Republic of Croatia is a tourist country, it is possible during the summer months, due to an increased demand for transport, additional vessel capacity will be hired according to the current demand, in addition to the regular lines.

3.1. Division of maritime passenger lines

Maritime passenger lines on which public transport is operated may be classified according to the importance of the direction:[10]

1. national lines - lines connecting the coast with inhabited islands and islands with each other, and coast lines
2. county and intercounty lines - lines improving the maritime connection of inhabited islands and settlements on the mainland, islands with each other, or the connection of settlements on the mainland in the area of one or more counties
3. local lines - lines improving the maritime connection of islands and settlements on the mainland, islands with each other, or the connection of settlements on the mainland in the area of the municipality or city.

According to the type of transport, lines are divided into:[3]

1. ferry lines (RO - RO lines) - traffic on this type of lines is carried out by vessels specially built for transporting vehicles and passengers
2. high-speed lines - are carried out with fast passenger ships defined in Article 5 of the Maritime Navigation Law (OG 181/04)
3. classic shipping lines - are operated by passenger ships whose speed is not less than 12 knots.

For the purposes of writing this paper and carrying out a more detailed analysis, only the national lines will be considered, if the division by type of transport is observed, only the RO - RO lines will be analyzed in terms of their specific seasonal character, the specific way of tariff formation and the differences in tariff formation compared to other European countries.

3.2. Analysis of the tariffs for the transport of passenger in Republic of Croatia

The analyzed lines are most often operated by ferries - these are combined ships that can accept a certain number of personal vehicles, trucks or buses in addition to passengers. The tariff is defined for vehicles according to height, length, passenger capacity and load capacity, therefore the company Jadrolinija distinguishes in its tariffs 8 main categories of vehicles that may or may not be followed by their driver. These categories are later divided into subcategories depending on the characteristics of the vehicle as shown in Table 1.

Table 1 Vehicle categories depending on the type and characteristics of the vehicle

TYPE OF VEHICLE	CHARACTERISTICS
Passenger car (up to 9 seats)	up to 5.00 m long and / or 2.00 high
	over 5.00 m in length and / or above 2.00 m in height
Lightweight (luggage trailer)	up to 3.00 m
	From 3.01 to 5.00m in length
	over 5.01 m length
Trailer (caravan, trailer, ...) camper	vehicle up to 5.00 m long
	from 5.01 to 7.00 m in length
	over 7.00 m long
Bus	from 10 to 17 seats
	from 18 to 33 seats
	from 34 to 54 seats
	over 54 seats
Truck	p to 3.00 t load capacity
	from 3.01 t to 4.00 t load capacity
	from 4.01 t to 5.00 t load capacity
	over 5.01 t load capacity
Motorcycle, moped	-
Motorcycle with trailer, tricycle, quad bike -	-
A bike	-

Children up to the age of 3 are generally entitled to free travel on all lines without restrictions such as number of journeys. Children up to the age of 12 are entitled to a discount on the basic fare, adults generally pay the full fare, but hand luggage is not charged. The following are also entitled to free transport: bus drivers, bus passengers, lorry drivers up to 10 tons, accompanying lorry drivers over 10 tons, pupils and students living on the island and studying on the mainland, pensioners over 65 years of age and elderly people (+65 years) living on the island.

3.3. Conditions and possibilities of realizing the right to preferential transport on public maritime transport line

In accordance with Ordinance on the conditions and manner of realization of the right to privileged transport on public maritime transport lines (Ordinance) the conditions and manner of realizing the right to privileged transport: the amount of the discount for the use of the right to privileged transport and the types of documents issued to users of the right to privileged transport [11].

Users residing on the island have the right to privileged transport on ferries, classic and high-speed lines in public transport with a public service obligation, connecting the island of their residence with the mainland or another island, by granting a discount on the current fare. In accordance Article 4 of the Ordinance on the conditions and manner of realization of the right to privileged transport on public maritime transport lines users are entitled to a reduced fare ticket for one return journey.

Table 2 Islands and lines / routes whose users have the exclusive right to privileged transportation [11]

ISLAND	LINE MANE	ROUTE
BIŠEVO	T602	Vis – Split
CRES	T401	Mali Lošinj – Zadar
ILOVIK	T332	Valbiska – Merag
	T334	Brestova – Porozina
	T401	Mali Lošinj – Zadar
KORČULA	T633	Ploče – Trpanj
LASTOVO	T634	Dominče – Orebić
	T633	Ploče – Trpanj
LOŠINJ	T332	Valbiska – Merag
	T334	Brestova – Porozina
MLJET	T633	Ploče – Trpanj
OLIB	T332	Valbiska – Merag
	T334	Brestova – Porozina
OŠLJAK	B409	Zadar – (Ošljak) – Preko
PAŠMAN	T431	Zadar – Preko
	B409	Zadar – (Ošljak) – Preko
PREMUDA	T332	Valbiska – Merag
	T334	Brestova – Porozina
RIVANJ	T431	Zadar – Preko
	B409	Zadar – (Ošljak) – Preko
SESTRUNJ	T431	Zadar – Preko
	B409	Zadar – (Ošljak) – Preko
SILBA	T332	Valbiska – Merag
	T334	Brestova – Porozina
SRAKANE VELE	T401	Mali Lošinj – Zadar
	T332	Valbiska – Merag
	T334	Brestova – Porozina
SUSAK	T332	Valbiska – Merag
	T334	Brestova – Porozina
	T401	Mali Lošinj – Zadar
UGLJAN	T432	Biograd – Tkon
UNIJE	T332	Valbiska – Merag
	T334	Brestova – Porozina
	T401	Mali Lošinj – Zadar

3.3.1. Beneficiaries of the right to transport at a discount

Based on the interpretation of the Ordinance, the right to privileged transport includes reduced-price transport and free transport. Beneficiaries of the right to discounted transportation are: [6]

1. children aged 3 to 12 years

2. vehicles and vehicles of lessees residing on the island and registered with the competent administrative body in the Republic of Croatia
3. vehicles of legal entities, i.e. vehicles registered for tradesmen, family businesses, freelance activities and lessees with the registered office of the vehicle user on the island and the vehicles registered with the competent administrative body in the Republic of Croatia
4. employees of the public health service and employees of other public services (police, armed forces, fire brigade, port authority) whose permanent place of work is on the island and their service vehicles used on the island,
5. employees of the public health service and their service vehicles if they provide regular transport of patients from the island to the mainland and vice versa,
6. other persons who acquire this right according to special regulations.

3.3.2. Beneficiaries of the right to free transport

Beneficiaries of the right to free transport in the coastal liner passenger transport of the Republic of Croatia are: [6]

1. pupils and students residing on the island who travel daily to a school or college outside the island,
2. pupils and students residing on the island who temporarily stay outside the island during the school period and come to the island on weekends,
3. children attending compulsory pre-school off the island of their residence, as well as pupils and students studying on the island of their residence and children attending pre-school on the island of their residence for activities off the island of their residence,
4. children aged one to three years,
5. retired persons and persons over 65 years of age residing on the island,
6. employees of the Public Health Service and their service vehicles when carrying out medical transport from the island to the mainland and vice versa,
7. police officers and their service vehicles when carrying out their duties on the islands,
8. employees of other public services (police, armed forces, fire brigade, port authority and GSS) and their service vehicles during disasters and emergencies, as well as search and rescue operations, with the consent of Coastal Shipping Agency, granted at the request of the payer, in accordance with the special regulations for protection against natural disasters and accidents.

The right to privileged transport at the state borders is realized by the users based on the Island Card for Maritime Passenger Transport, Island Card for Maritime Transport of vehicles and vignettes, student documents and issued tickets, unless Ordinance provides otherwise for certain categories of users.

A reduction of up to 50% of the regular ticket price is granted for reduced-price transport. The amount of thediscount for the users referred to in Article 2, paragraph 2 of the Ordinance shall be determined by the Management Board of the Coastal Shipping Agency when setting the maximum level of the price for public transport services with a public service obligation.

For the vehicles referred to in Article 2, paragraph 2, item 3 of the Ordinance, the right to a reduced fare for one return journey per day may be realized on all ferry lines connecting the owner's or user's island of residence with the mainland or any other island applicable to the island. residence of a natural person.

For the vehicles referred to in Article 2, paragraph 2, point 4 of the Ordinance, the right to a reduced fare may be realized on an unlimited number of journeys per day on all ferry lines connecting the island of residence of legal entities, traders, family businesses, with the mainland or another island applicable to the island of residence of the company.

3.4. Analysis of categories of passengers and personal vehicles used in the formation of tariffs in the RH

The main characteristic of passenger transport on the coastline in the Croatian part of the Adriatic is significant seasonal fluctuations resulting from unequal tourist demand during the calendar year. The dominant shipping company on the Croatian market, Jadrolinija, distinguishes between off-season and seasonal prices, which are the result of changes in transport demand. A more detailed overview of the categories and methods of tariff formation is shown below on the example of ferry line 335, one of the most frequent national lines in coastal liner transport of Republic of Croatia which in 2019. Had a total number of 917.942 passengers and 342.363 vehicles [12] .

Table 3 Example of ticket price on the national ferry line no. 335 Prizna - Žigljen. [13]

CATEGORY	OFF-SEASON	SEASON	ISLANDERS	PUBLIC SERVICES
Children from 0 to 3 years	0 KN	0 KN	0 KN	0 KN
Children from 3 to 12 years	7 KN	8,50 KN	0 KN	0 KN
Elderly + 12 years	14 KN	17 KN	7 KN	9 KN
Vehicles shorter than 5 m	80 KN	96 KN	48 KN	48 KN
Vehicles longer than 5 m	134 KN	161 KN	81 KN	81 KN

In addition, there are 2 categories of vehicles, shorter and longer than 5 meters, and for vehicles longer than 5 meters and / or higher than 2 meters, a 40% higher price is paid. Season ticket prices are on average 16% higher than out of season. Children aged 0-12 years who have a residence or stay on the travel island or belong to a public service do not pay tickets. Persons over 12 years of age who have a residence on the island or belong to a public service pay an average of 50% of the ticket price. Vehicles belonging to island residents or public services also pay 50% of the ticket price, and the island fare list is valid all year round.

The off-season fare list is valid for the period 01.01. - 03.06.2021. and 04.10. - 31.12.2021, and seasonally from 04.06. - 03.10.2021. The island fare list and the public service fare list are valid all year round. Children up to 1 year of age travel free of charge and do not receive a ticket, but the parent/guardian card indicates that the person is traveling with a child up to 1 year of age. Children ages 1 to 3 also travel free but receive a ticket. Children 3-12 years old pay half the ticket price, while adults (+12) pay full ticket price without benefits and carry-on baggage is not charged.

4. COASTAL LINER PASSENGER TRANSPORT OF THE REPUBLIC OF CROATIA IN COMPARISON TO THE OTHER EUROPE COUNTRIES

According to the latest Eurostat data, maritime passenger transport in Europe is mainly carried out by national ferry services, with the same passengers being statistically recorded twice, once when boarding a ferry in an EU port and the second time when disembarking from the same ferry in another EU port. In 2013 Italian and Greek ports accounted for more than one-third of EU-28 maritime passenger transport. Italy accounted for 18.32% (73.24 mil.) and Greece for 18.24% (72.92 mil.) of total EU-28 maritime passenger transport (399.67 mil.) [14]. With 86.5 million and 73.9 million maritime passengers respectively, ports in Italy and Greece together accounted for 38.5% of the total number of passengers embarked and disembarked in EU ports in 2019 (Chart 1). The graph shows that Italy and Greece remain the leading countries in terms of maritime passenger transport in the EU, which is why they are considered relevant countries when comparing the categories of passengers and vehicles in liner shipping with those of the Republic of Croatia [15].

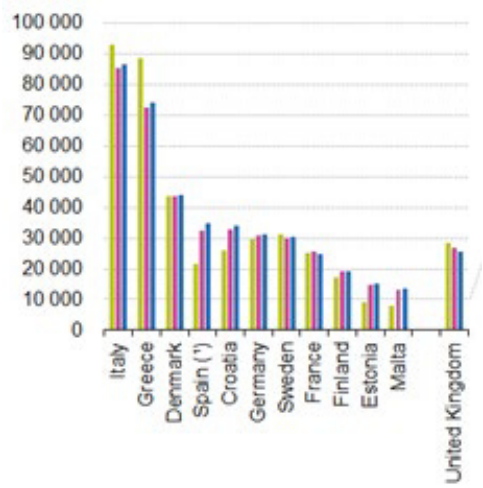


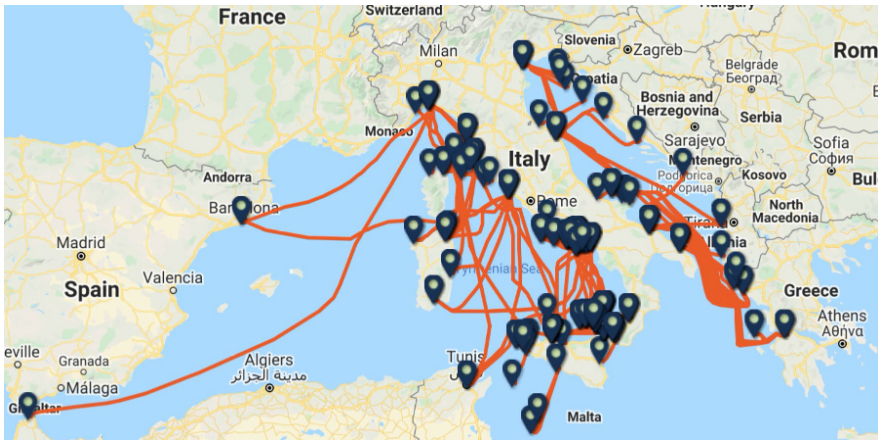
Chart 1 Leading countries by number of passengers in the EU in 2009, 2018 and 2019 (in thousands) [15]

From the data presented in Chart 1, it can be concluded that Italy and Greece dominate the European market for maritime passenger transport. Furthermore, according to Eurostat data, if cruise passengers are excluded, Italy and Greece also lead in maritime passenger transport, both in total transport and in domestic transport only. Considering the fact that in the Republic of Croatia there is no defined way of setting tariffs or a detailed way of dividing the category of passengers and vehicles, the categories applied by Italian and Greek ferry operators are analyzed below in order to improve the existing model applied in Croatia.

The selected countries resemble Croatia in their climatic and geographical characteristics. They have a highly indented coastline, especially Greece, and the ferries that sail on their territorial seas must have similar specifications for undisturbed navigation as those used in the Croatian coastal area.

4.1. Ferry operators in the coastal liner passenger transport of Italy

Italy is a country with a long maritime tradition and has been a leader in coastal liner passenger transport for years. There are many ferry companies operating ferry routes in Italy, as well as Italy's connections with other countries such as France, Greece and or Croatia. There is currently a wide range of ferries connecting Italy to over 28 destinations, and ferries sail weekly from various ports around the world to other ports in Italy. The lines are shown on map 1.



Map 1 Italian Ferry Lines[16]

There are a total of 208 national and international routes served by 26 different shipping companies, and there are 101 national ferry routes served by 17 shipping companies, some of which are listed in Table 4.

Table 4 Share of total ferry transport of Italy of selected ferry companies [17]

CARRIER	NUMBER OF ROUTES	SHARE
Siremar	64	51.20%
Snav	8	6.40%
Caremar	9	7.20%
Tirrenia	8	6.40%
Torremar	4	3.20%
Gnv	8	6.40%
Grimaldi Lines	7	5.60%
Corsica Ferries	5	4.00%
Moby	5	4.00%
Medmar	4	3.20%
Positano Ct	2	1.60%
Blu Navy	1	0.80%

Table 4 shows the share of each shipping company in the total traffic on Italian ferry lines. The largest ferry company is Siremar with 64 routes and a 51.20% share of the total number of routes. It is important to note that there are 101 different lines served by 1 or more shipping companies. For example, the Piombino-Portoferraio line is served by as many as 4 shipping companies: Corsica Ferries with 21 lines per week, Moby with 84 lines per week, Torremar with 147 lines per week and Blu Navy with 56 lines per week. The categories and types of tariff formation in Italy are analyzed below.

4.1.1. Analysis of the categories of passengers and personal vehicles used in the formation of tariffs in Italy

The categories of passengers and passenger vehicles used in the formation of tariffs for three ferry operators operating in the coastal area of Italy are analyzed below. The tables are prepared according to the available data from Siremar, Tirrenia and Medmar [18]–[20].

Table 5 Categories of passengers used for the formation of tariffs in Italy's coastal liner passenger transport

CATEGORY	SIREMAR	TIRRENIA	MEDMAR
Children under 1 year	NO	YES	NO
Children from 1 / 0-3 / 4 years	YES	YES	YES
Children from 3 / 4-11 / 12 years	YES	YES	YES
Elderly + 12 years	YES	YES	YES

Table 5 lists the passenger categories according to which the Italian ferry operators Siremar, Tirrenia and Medmar define their tariffs. All analyzed ferry operators have defined tariffs for 3 categories among passengers, as is the case with Jadrolinija. Children are divided into two categories at Siremar ferry company, i.e. children aged 0-3 and 04-11. Medmar also divides them into 2 categories, while Tirrenia divides them into 3. In Medmar, the first category refers to children from 0-3 years old and the second from 3 to 12 years old, Tirrenia has an additional category for children up to 1 year old, while the other 2 categories are the same as in Medmar. Unlike the Greek carriers that will be shown below, the Italian carriers do not have such detailed categories for passengers.

Table 6 Categories for passenger cars used to form tariffs in Italian coastal liner passenger transport.

CATEGORY	SIREMAR	TIRRENIA	MEDMAR
Vehicles up to 3.5 m	X		
Vehicles up to 4 m	X	X	X
Vehicles up to 4.5 m	X		X
Vehicles longer than 4.5 m	X		X
Vehicles from 4.01 to 5 m		X	
Vehicles longer than 5.00 m		X	

In contrast to Jadrolinija, the shipping companies Siremar, Medmar and Tirrenia use different categories in the formation of tariffs for passenger cars in coastal liner transport. Siremar distinguishes the largest number of categories, namely 4 as follows: nehicles up to 3.5 m, vehicles up to 4 m, up to 4.5 m and vehicles over 4.5 m. Carriers Tirrenia and Medmar distinguish one category less and divide vehicles into 3 groups. Tirrenia in categories: vehicles up to 4 m, from 4.01 to 5 m in length and longer than 5 m. While Medmar divides them into categories similar to Siremar: vehicles up to 4 m, up to 4.5 m and longer than 4.5 m.

4.1.2. Analysis of discounts by categories in Italian coastal liner passenger transport

Starting from based adult category (+12, i.e. +11 years), which is the starting point for determining the tariffs, it is possible to analyze the discounts that passengers in the other categories receive.

Table 7 Discounts for passengers and vehicles by category in Italy

CATEGORY	DISCOUNT		
	SIREMAR	TIRRENIA	MEDMAR
Children from 0-3 / 4 years	80%	100%	70%
Children from 3 / 4-12 years	40%	50%	40%
Elderly + 11/12 years	0%	0%	0%
Vehicles up to 3.5 m	0%	-	-
Vehicles up to 4 m	0%	0%	35%
Vehicles up to 4.5 m	0%		15%
Vehicles longer than 4.5 m	0%		0%
Vehicles longer than 4.01 to 5 m		0%	
Vehicles 5 m long		0%	

As shown in Table 7, children under 3 years of age are entitled to free transport in two of the three transport companies analyzed, so in the case of the Siremar transport company, children aged 0-3 years pay for the ticket in the low season. The only case where children aged 0-3 do not pay for a ticket when using the ferry of the carrier Siremar is when they are residents of the island. For the second category of passengers, children aged 4-11 years, a 40% discount is granted. Siremar distinguishes 4 categories of vehicles, but applies the same price for all, only a 50% discount is charged when it comes to residents. Like Jadrolinija, Siremar distinguishes between seasonal and low season tariffs and offers the possibility to buy discounted tickets for island residents, but not for public service. Siremar allows island residents to buy a 55% cheaper ticket, but unlike Jadrolinija, which allows children from 3 to 12 to travel for free, Siremar charges them tickets at a 40% discount compared to the group of passengers aged 11 and over. Siremar also charges islanders different discounts depending on the vehicle group. Island vehicles shorter than 3.5m are charged a 69% discount, while vehicles longer than 4.5m are charged a 38% discount. In addition, Siremar offers a category of excursion groups in which users who buy a larger number of tickets can receive a certain discount on the amount agreed with the carrier. On Siremar's lines, passengers staying on small islands can receive discounts through a special "Resident" price list.

In analyzing the carrier Tirrenia tariffs are formed depending on the category of passengers and thus distinguish 4 categories, of which for the first two, ie, children up to 1 year and children from 1 to 4 years are always free. For the third category, children from 4 to 12 years old are given a 50% discount, while those over 12 years old pay the full price of the ticket. At Tirrenia, the discount is not calculated regardless of the length of the vehicle. The Tirrenia special discount is calculated for all 3 categories of vehicles if they are residents-only vehicles. Tirrenia also offers discounts for residents of Sardinia, Sicily and the island of Tremiti.

Carrier Medmar has both passengers and vehicles are divided into 3 categories, each of which pays a certain amount for transportation, and vehicles are differentiated into 3 categories instead of 2 as in Jadrolinija. For the 1st category of passengers, children from 0-4 years old, whether they live on the island or not, pay 72% less for the ticket. Children from 3-12 years old have 40% discount. Medmar distinguishes 3 vehicle categories, and the fare difference between the shortest and the longest vehicle category is 35%. Medmar offers special discounts for residents of Ischie and Procidia..

4.2. Ferry operators in the coastal liner passenger transport of Greece

Greek coastal liner passenger transport is the largest shipping market in Europe, accounting for 16.9% of the total Volume. With 143 ports that are ferry ports, Greece has the densest network of ferry ports in Europe [21]. Between 17 and 19 shipping companies operate in the Greek ferry market, with some of them also forming groups. Following the liberalization of coastal ferry services in 2002, the market structure has not changed significantly. A limited number of operators, usually maximum of two per line on the main markets, indicates the existence of an oligopolistic market structure [22]. On the main lines, the transport activity is carried out by 11 shipping companies, so it is possible to speak of an extensive concentration of the sector.

Map 2 Greek Ferry Lines [23]

Greece also has the largest number of maritime passengers in Europe. The fact that it covers 18% of European passenger demand for RO -RO transport services, despite representing only 2.2% of the European Union population, implies that passenger demand in Greece has unique characteristics that distinguish it from other European countries [24]. The system is characterized by high seasonality caused by uneven tourism demand throughout the year [25]. One third of the annual turnover is realized in the summer months. In the low season, passenger traffic is limited, so that the operation of coastal shipping companies depends mainly on truck transport.

The value of the ferry ticket is directly related to the ferry operator's pricing policy. The price of a ticket charged to passengers depends on a number of variables, such as:[25]

1) route (including the level of competition in the ferry market or with other modes of transport and berths in ports).
2) type of passenger accommodation (e.g. cabin or seat).
3) category of accompanying vehicle (e.g. sorted by length)
4) season (summer / winter).

Regardless of whether the traveler buys a ticket in Greece, in another European country, or in another country in the world, the price of the ticket is always the same. The price may include discounts based on some specific rights, but these discounts are defined and apply to those affected by certain criteria, regardless of where they booked the ticket [25]. Since the countries leading in the number of passengers carried are used as an example for the analysis of tariff formation and division of categories in liner shipping, in addition to Italy, Greece is also analyzed below.

4.2.1. Analysis of the categories of passengers and personal vehicles used in the formation of tariffs in Greece

The following section analyzes the categories of passengers and personal vehicles used in the formation of tariffs for three ferry operators operating in the coastal area of Greece. The following tables are based on available data from Blue Star Ferries, Hellenic Seaways and Thassos Ferries [26]–[28].

Table 8 Categories of passengers used to form tariffs in the Greek coastal liner passenger transport

CATEGORY	BLUE STAR FERRIES	HELLENIC SEAWAYS	THASSOS FERRIES
Children up to 5 years	YES	YES	YES
Children from 5 to 10 years	YES	YES	YES
Teenagers (11-17 years)	YES	NO	NO
International Student Identity Card "ISIC" holders	YES	YES	YES
Students of Greek universities	YES	YES	YES
Adults (25 - 60 years)	YES	YES	YES
Unemployed adults	NO	NE	YES
Older people (60+ years)	YES	SOMETIMES	NO
Excoursion groups	YES	YES	YES

Table 8 lists the passenger categories used by the Greek ferry operators Blue Star Ferries, Hellenic Seaways and Thasssos Ferries to define fares. All analyzed ferry operators have defined tariffs for the categories: children up to 5 years old and children from 5 to 10 years old. The company Blue Star Ferries offers the teenager category (11-17 years) to the buyer when purchasing a travel ticket. This category is primarily used to determine whether unaccompanied minors have parental consent to travel. In addition, the companies studied distinguish between International Student Identity Card "ISIC" holders and students of Greek universities as special categories of travelers. The basic category that determines the ticket price for all analyzed companies is the adult category (25-60 years old). Thassos Ferries highlights unemployed people as a special category, while the other two operators do not specify this category when purchasing tickets. All three analyzed ferry operators offer a category of the excursion group, where users who buy a larger number of tickets can get a certain discount on the quantity. In addition, the Greek ferry operators also distinguish between seat types in the liner coastal passenger transport. The shipping company Blue Star Ferries divides them into Economy Lounge, Air seats (Economy) and Business Lounge, which creates the possibility to generate higher revenues depending on the travel comfort.

Table 9 Categories for passenger cars used for the formation of tariffs in Greece

CATEGORY	BLUE STAR FERRIES	HELLENIC SEAWAYS	THASSOS FERRIES
Cars (up to 4.25 m)			X
Cars (over 4.25m)			X
Vehicles less than 6 m long and less than 2 m high		X	
Vehicles longer than 6 m and higher than 2 m		X	
A unique category for all cars	X		

Blue Star Ferries, Hellenic Seaways and Thassos Ferries use different categories when defining the price of passenger vehicles in coastal liner transport. Thassos Ferries distinguishes the categories passenger cars up to 4.25 m and passenger cars over 4.25 m. Hellenic Seaways also differ two categories for passenger cars, but in addition to the length of the vehicle, the width is also given as a criterion for each category. Therefore, the categories are vehicles under 6 m in length and under 2 m in height and vehicles over 6 m in length and over 2 m in height. Blue Star Ferries applies a unique category to all vehicles, regardless of their height and width. Unlike the Italian carriers that were shown before, the Greek carriers do not have such detailed categories for cars.

4.2.2. Analysis of discounts by category in Greek coastal liner passenger transport

Starting from the adult category (25-60 years old), which is the starting point for determining the fare, it is possible to analyze the discounts that passengers of other categories receive; the discounts are presented in Table 10 and are explained below.

Table 10 Discounts for passengers by category

CATEGORY	BLUE STAR FERRIES	HELLENIC SEAWAYS	THASSOS FERRIES
Children up to 5 years	100 %	100 %	100 %
Children from 5 to 10 years	50 %	50 %	50 %
International Student Identity Card "ISIC" holders	50 %	50 %	50 %
Students of Greek universities	50 %	50 %	50 %
Adults (25 - 60 years)	0	0	0
Unemployed adults	Not defined	Not defined	20 %
Older people (60+ years)	10 %	Not defined	Not defined
Excoursion groups	On request	On request	30- 50 % per person

Children up to 5 years of age are entitled to free transportation on all three shipping companies analyzed, while the ticket price for the category of children from 5 to 10 years of age is 50% of the ticket price for adults. International Student Identity Card "ISIC" holders and students of Greek universities, whether they travel with Blue Star Ferries, Hellenic Seaways or Thassos Ferries, pay 50% of the ticket price.

Unlike the other carriers, Thassos Ferries offers a 20% lower ticket price for the category Unemployed Adults. For people over 60, Blue Star Ferries offers a 10% discount on the ticket price, while Hellenic Seaways gives them a discount on certain routes and in varying percentages compared to the adult category ticket price. The companies also provide discounts for excursion groups. Groups that choose to use the services of a Blue Star Ferries or Hellenic Seaways operator send a request, based on which the price is then determined. Thassos Ferries offers excursion groups a discount of 30-50% per person, depending on the route traveled and the size of the group. In addition to the above categories, Blue Star Ferries also offers discounts on certain routes as well as 20-25% lower prices for people aged 13-25 and discounts for family trips.

5. CONCLUSION AND DISCUSSION

For the Republic of Croatia, which has a highly indented coastline and many inhabited islands, passenger transport on lines connecting the islands with the mainland and the islands with each other is of the most importance. Passenger transport is provided on predetermined lines on which the price, offer, conditions of travel and discounts are fixed, and passengers cannot claim ignorance of the conditions of travel or prices, since the data are publicly known and they can access them at any time. If necessary, additional vessel capacity may be hired during the summer months due to increased demand for transportation, in addition to the regular lines that operate throughout the year.

Based on the data obtained and the market analysis, the following SWOT analysis was prepared as a starting point for strategic considerations on how to improve Jadrolinija's tariff model. After analyzing the main strengths, weaknesses, opportunities and threats, proposals were made to change the tariff model of Jadrolinija. The analysis of the obtained research results as the main strengths and weaknesses (internal factors) and opportunities and threats (external factors) show:

Table 11 SWOT analysis of Jadrolinija's tariff model

STRENGTHS	WEAKNESSES
- Dominant carrier on the Croatian market - Annual growth in the number of passengers and vehicles on the ferry routes - A large number of daily connections between the coast and the islands - Competence of the staff - High quality of transport service - Online ticket sales system - Partner in EU projects	- Impossibility to set the price of tickets completely independently - High maintenance costs - Insufficiently significant changes in tariffs - Obligation to provide public service regardless of demand - Inconsistency of business policy and changes on the market - Poor marketing - Low level of computerization - Slow adaptation to market changes
OPPORTUNITIES	THREATS
- Greater state incentives - Recognition of Croatia as a tourist destination - Slight increase in population on the islands - Investments in new technologies - Development of the islands - EU funds	- Fluctuation of various micro and macroeconomic indicators - Various negative influences on transport (e.g. wars, pandemics, natural disasters, etc.) - Under-utilization of the island's economic capacity - Entry of foreign shipping companies into the Croatian market - Depopulation

The value of the ferry ticket in Greek and Italian maritime transport is directly related to the pricing policy of the ferry operator. The price of a ticket charged to passengers depends on a number of variables such as: route (including the level of competition in the ferry market or other modes and berths in ports), type of passenger accommodation for passengers (e.g. cabin or seat), category of accompanying vehicle (e.g. sorted by length) and season (summer/winter). These variables are used not only by Greece and Italy but also by other European countries. By analyzing the pricing in the coastal liner shipping of Greece and Italy, it is also possible to see how their operators apply revenue management, which has been present in air traffic for many years. If this principle were to be introduced in the Republic of Croatia, it could increase demand for costal liner passenger transport and allow Croatian operators to earn higher revenues. T If the demand for transport services increases, and with it the number of visitors to the island, this could lead to higher demand for all other services that are important for the economic development of the Croatian islands (e.g. hospitality, catering, trade ...).

Based on the analysis of the shipping companies operating on the territory of Greece, it is proposed to design a categorization of passenger tariffs in Croatian coastal liner transport depending on the age group, as applied by the shipping company Blue Star. Blue Star divides passengers into the following categories: children (up to 4 years), children, (4 -10 years), teenagers (11-17 years), adults (18 - 60 years), elderly (61+ years). It is also proposed to introduce a discount on tickets for excursion groups. This would

increase the interest of travel agencies, which in this case would choose ferry transport more often than some other types of transport.

Moreover, based on the analysis of the shipping companies operating in Italy, it is suggested that in Croatian coastal liner passenger transport tariffs are set differently according to the age group, as applied by the shipping company Medmar. Medmar divides passengers into the following categories: children (up to 4 years), children (4 -12 years), adults (+12 years). The biggest difference between the current ticketing system and the proposal is that children up to 4 years old will have to pay one ticket, but with a discount and the 2nd category (children 4-12 years old) will be discounted with a lower percentage than they currently are.

Also, the introduction of an additional category for vehicles depending on the length would have a positive impact on the company's profit. Thus, instead of the current 2 categories (up to 5 meters and over 5 meters), personal vehicles would be divided into 3 categories, as is the case with Medmar: vehicles up to 4 meters, vehicles from 4 to 4.5 meters and vehicles over 4.5 meters. Dividing a current category (vehicles up to 5 meters) into 3 new ones would facilitate the change of ticket prices, thus allowing a fairer payment system for personal vehicles, as most personal vehicles are between 4 and 5 meters long.

In addition, it was noted that Greece and Italy do not have a privileged rate for public services and the Republic of Croatia introduced it only in 2017, so the need to reintroduce a specific fare card for public services needs to be assessed.

In conclusion, given the different seating categories observed among Greek carriers, it is suggested that in the future, when procuring new vessels, efforts should be made to procure ferries offering different seating categories.

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