Importance of the water transport sector for Romania’s economy

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Abstract. The importance of the transport sector for the national economy is given by its impact on growth, employment and sustainable development. The transport sector corresponds to the volume of goods exported or imported. According to EU data, transport and storage costs may account for up to 15% of the value of a finished product. Competitive maritime transport can provide many benefits for both the national and local economy. Port activity is complementary to maritime transport and involves the development of services related to transport. In Romania, the involvement of the private sector in water transport activities is confirmed by the over 200 active enterprises in 2017. The present paper highlights the place and role of the water transport sector for the national, regional and local economy by considering the importance of Romania on the map of European trade and the EU transport network.

1. Introduction

Water transport varies from other modes of transport through its specificity and characteristics. Thus, a large volume of freight that can be transported by using a single mode of transport to reduce the cost per tonne, which is the main factor that matters in transport activity. These high volumes of goods that are imported or exported imply the importance of the water transport sector (NACE division 50) for the national economy as well as for the local economy.

However, in order to reach a high freight volume in maritime and inland ports, the transport system must help produce a favourable economic and social framework. The existence of an environment advantageous to the growth and development of water transport leads to local or regional sustainability whenever the actions consider exogenous factors.

Romania, by maritime and inland waterway transport, has an important role in the Trans-European Network. The network of inland waters, the Black Sea and port connections is on the list of trans-European freight corridors, which is why the Constanta port is part of the core network (strategic importance for European and Eastern transport flows).

Shipping is dependent on international trade worldwide, which, in turn, depends directly on production. The volume of international trade has an increasing trend because of globalization. The highest share in the global freight volume is raw material and maritime transport that is mainly used for distribution.

Once Romania became an important exporter of agricultural products, mainly cereals, new strategies without export policy restraints for agricultural products were needed for several sectors of the national economy. The new strategies can help provide Romania with advantages over other countries of the Black Sea Basin and the improvement the relations with the importing countries [1].
Constanta Port has a history of 119 years, being at the intersection of the commercial routes connecting the Asian markets with Central and Eastern European countries. The port is intended to be a hub for container traffic in the Black Sea, with help from DP terminal, the largest container terminal in the Black Sea basin, with a capacity of approximately 1.2 mil TEU. Constanta Port has also become a transit centre for several types of goods lately, with direct access to the Central and Eastern European countries through the Pan-European Corridor VII - Danube.

2. Importance of Constanta Port

The transport sector for the Romanian economy is important and can be highlighted by the value of exported and imported goods and services from GDP. The transport sector is part of the logistics chain for any exported or imported good. In 2017, exports accounted for 41.5% of GDP, and imports represented 43.7% of GDP which corresponds to a two-digit increase compared to 2010 [2]. These values are close to the EU averages, which for exports is 45.7% and for imports is 41.9%.

In Romania, among all the modes of freight transport, the most used are road and rail transport, and this characteristic is also the case in the European Union. Thus, in 2017, road and rail transport accounted for 77.55%, the inland waterway transport represented 7.98% while maritime transport had a share of 12.67% of total freight transport in Romania [3]. The recorded shares for maritime and inland waterway transport are below the EU average.

In the last period, transport on inland waterways has been dynamically transformed by tons of wheat, sunflower, corn, ores and other good from countries such as Serbia, Austria and Hungary, which take the sea route through Constanta Port in order to reach, mostly, in the Mediterranean basin. Also, domestic cereal production increased freight transport on the Danube by 17% in 2017 compared to the amount in 2009 [2]. This increase was gradual, with small oscillations, which depend exclusively on the impossibility of using the Danube because of ice or low-water levels. Despite the Romanian river sector having many inland ports, the Bratislava and Ruse ports have the infrastructure and superstructure needed to handle a richer portfolio of cargoes than the Romanian ports [4].

The maritime transport through the Romanian ports registered an increase of about 30% in 2017 compared to 2009. Indeed, the value recorded in 2017 does not exceed those in the years before the economic crisis, which 2008 recorded the highest freight traffic volume through seaports after the 1990s. In 2008, Constanta Port served as a transhipment centre for goods arriving from the Far East and had a transhipment incidence of over 75% [5].

Globalization along with structural changes in the commodity distribution chain influences the degree of development for the countries of the Black Sea basin. Regarding competition in the Black Sea basin, the port with the highest freight traffic volume is Novorossiysk in Russia. The Romanian Black Sea ports compete regionally with Varna in Bulgaria, Batumi in Georgia, Samsun and Trabzon in Turkey, and Odessa in Ukraine.

Comparing the freight traffic volume from Romanian seaports and Bulgaria, in 2017, Romania’s volume exceeded by almost 50% of the traffic registered in the neighbouring ports. Both countries have a good potential for growing exports based on scores that measure the openness of markets in Romania and Bulgaria [4].

Constanta Port, one of the 20 largest ports in the European Union, in 2017 registered a freight traffic volume of 61 million tons that generated an income of 349 million lei for N.C. Maritime Ports Administration S.A. Constanta, which is 6.17% higher than that in 2016.

An issue that has been taken very seriously lately, both at EU and global levels, is pollution. Expenditure for environmental protection is not directly dependent on the evolution of national GDP [6]. Regarding the shipping industry, GDP may be influenced by factors such as infrastructure, investment and legislation.

Regarding the maritime and inland waterway national transport, it is very important to indicate the existence of a national fleet contributing to freight traffic in maritime and inland ports. For Romania, the data in Table 1 shows that the number of maritime vessels dropped sharply, especially for specialized cargo ships.
Table 1. Seagoing vessels registered at the end of the year (number), selected years³.

| Categories of maritime vessels | 1991 | 2008 | 2017 |
|-------------------------------|------|------|------|
| Liquid bulk                   | 17   | 10   | 5    |
| Dry bulk                      | 69   | :    | :    |
| General cargo - non-specialized | 183  | 6    | 2    |
| Dry cargo barge               | :    | 11   | 16   |
| Passenger                     | :    | 1    | 2    |
| Fishing                       | :    | 11   | 5    |
| Offshore activities           | :    | 3    | :    |
| Tugs                          | :    | 52   | 62   |
| Other vessels                 | :    | 88   | 321  |

³Source: National Institute of Statistics, Tempo online database, TRN125A
Legend: “:” – missing data

The evolution of the number of inland waterway vessels has been opposite that of maritime vessels according to Eurostat online database. For example, the number of self-propelled vessels, dumb and pushed vessels was 88% higher in 2015 than the number in 2008, with a positive trend each year. In contrast, comparing the number of Romanian’s inland waterway vessels with other European countries in 2015, Romania’s fleet is 2.87% of Netherlands’ fleet, a higher percentage (13.87%) of Germany’s fleet and almost triple the number of vessels owned by the Czech Republic or Bulgaria [2].

It is interesting to analyze the value of exports and imports of goods transported by inland waterways or sea based on the fleet owned by Romania.

In 2017, the value of freight volume exported by water transport represents 16.6%, lower by 1.2% than that in 2016. In contrast, the value of imports is 14.5%, higher by 0.9% than that in 2016. The value of the exports on the inland waterways registered the highest value in 2017, with reference to the last fifteen years, while, for maritime transport, the highest value was in 2014.

Grains comprise a high share in the export of goods using water transport. Romania remains a major producer of cereals at European and world levels, leading to increased exports. The grain transported by road had a higher share than another transport mode from 1990 until 2009. The maritime and inland waterway transport of grain has exceeded the road and railway transport since 2010, reaching the highest value of 59% of the total volume of grain transported in 2016.

The oil trade with destinations such as England, Germany, France, the Netherlands and Italy has gradually increased. Similarly, the traffic of imported goods such as cars, coal, manufactured products and medicines had a strong evolution.

Table 2. GDP by development regions calculated according to NACE Rev.2, 2016⁴.

| REGIONS            | Year 2016, millions lei | % from national GDP |
|--------------------|-------------------------|---------------------|
| NORTH - WEST       | 90116.7                 | 11.78%              |
| CENTER             | 86592.9                 | 11.32%              |
| NORTH - EAST       | 77167.7                 | 10.09%              |
| SOUTH - EAST       | 79909.8                 | 10.44%              |
| SOUTH - MUNtenIA   | 93684.9                 | 12.24%              |
| BUCHAREST - ILFOV  | 207571.6                | 27.13%              |
| SOUTH - WEST OLTENIA | 55335.1            | 7.23%               |
| WEST               | 74224.5                 | 9.70%               |
| TOTAL              | 765135.4                |                     |

⁴Source: National Institute of Statistics, Tempo online database, CON103I
To highlight the importance of the water transport sector in Romania's economy, GDP among the eight Romanian development regions must be studied. Thus, as shown in Table 2, the South-East region ranks fifth of the eight regions according to GDP per region in 2016. The position is mainly because of the increased volume of cargo operated in the maritime and inland ports in the region.

If we compare the GDP of the South-East region by counties, Constanta county has 43%, Galati county has 16.23%, Braila county has 10.49% and Tulcea county has 7.44%. In all of the aforementioned counties, there are companies involved in inland waterway or maritime transport activities.

Another defining element for underlining the role of the water transport sector in Romania’s economy includes the active enterprises operating in this sector. Thus, Table 3 shows the number of active enterprises operating in the water transport sector according to the NACE Rev. 1 and Rev.2 classification of national economic activities.

**Table 3.** Active enterprises, by the selected activity of the national economy at the level of NACE Rev.1 and Rev.2 division and size classes based on the number of employees, selected years.6.

| NACE Rev.2 (economic activities) | Size classes | Years | MU: Number |
|---------------------------------|--------------|-------|------------|
|                                 |              | 1997  | 2000      | 2005 | 2008 | 2009 | 2010 | 2016 | 2017 |
| TOTAL                           | Total 0–9 persons | 327736 | 318370 | 450202 | 554967 | 541696 | 491805 | 527792 | 553796 |
|                                 | 10–49 persons   | 295313 | 278710 | 398865 | 495019 | 485714 | 438400 | 468897 | 494622 |
|                                 | 50–249 persons  | 23015  | 29902  | 40032  | 48131  | 45791  | 43805  | 48373  | 48777  |
|                                 | >250 persons    | 6627   | 7681   | 9366   | 9939   | 8577   | 8047   | 8791   | 8658   |
| 50 Water transport               | Total 0–9 persons | 125   | 135   | 182   | 168   | 277   | 296   | 187   | 217   |
|                                 | 10–49 persons   | 53     | 65     | 107   | 121   | 233   | 248   | 147   | 175   |
|                                 | 50–249 persons  | 26     | 42     | 58    | 30    | 29    | 34    | 30    | 31    |
|                                 | >250 persons    | 35     | 22     | 14    | 15    | 13    | 12    | 9     | 10    |
|                                 | 11              | 6      | 3      | 2     | 2     | 2     | 1     | 1     |

* Source: National Institute of Statistics, Tempo online database, INT101B and INT101P

As shown in Table 3, the number of active enterprises with more than 50 employees in the water transport sector has a decreasing trend, and this relationship is true for all sectors of activity. The total number of active enterprises in the national economy increased by 69% in 2017 compared to that in 1997, and the same percentage is recorded for the increase of enterprises in the water transport sector.

For enterprises with up to 49 employees that generally provide services, the trend is increasing in the analyzed period for both the water transport sector and the national economy. Thus, the number of enterprises in the water transport sector increased by over 250% in 2017 compared to 1997, and the number of enterprises in the national economy increased by over 70%.

To show the importance of the water transport sector in the region's economy, Table 4 presents the number of companies from this sector operating in the South East Region according to NACE Rev.2 Classification.
Table 4. Active local units, by the selected activity of the national economy at the level of NACE Rev.2 classes, development regions, selected years a.

| NACE Rev.2 - classes | Development regions | Years | 2008 | 2009 | 2010 | 2015 | 2016 | 2017 |
|----------------------|---------------------|-------|------|------|------|------|------|------|
| 5010 Sea and coastal passenger water transport | TOTAL | | 2 | 5 | 27 | 23 | 16 | 25 |
| | SOUTH - EAST | | 2 | 5 | 8 | 9 | 5 | 11 |
| 5020 Sea and coastal freight water transport | TOTAL | | 38 | 98 | 104 | 41 | 37 | 26 |
| | SOUTH - EAST | | 23 | 27 | 27 | 17 | 14 | 9 |
| 5030 Inland passenger water transport | TOTAL | | 19 | 74 | 69 | 40 | 51 | 72 |
| | SOUTH - EAST | | 13 | 31 | 25 | 19 | 27 | 42 |
| 5040 Inland freight water transport | TOTAL | | 115 | 109 | 103 | 96 | 89 | 94 |
| | SOUTH - EAST | | 87 | 77 | 65 | 60 | 58 | 61 |
| 5222 Service activities incidental to water transportation | TOTAL | | 256 | 257 | 256 | 262 | 268 | 264 |
| | SOUTH - EAST | | 221 | 230 | 225 | 234 | 238 | 235 |

a Source: National Institute of Statistics, Tempo online database, INT101U

The data presented in Table 4 show that over 74% of the companies in the water transport sector operate in the South-East region. The percentage shows the importance of this activity sector for the regional economy. For the local economy, Constanta county has 65% of all the South-East region companies with activities in maritime and inland waterway transport, followed by Tulcea county with 17% and Galaţi county with 11%.

Regarding new enterprises founded in the H-Transport and storage section according to the NACE Rev.2 classification of national economic activity, in 2016, there were 40.6% more than that in 2009 but 12% less than that in 2008, the best year for water transport sector over the last two decades. With regard to the size of newly created businesses, only 0.5% of enterprises have more than 10 employees. In conclusion, newly enterprises focus on delivering services for the water transport sector.

At the same time, 54.6% of the newly enterprises founded in the H-Transport and Storage section in 2016 close in the same year, indicating the dynamics of the maritime industry.

Water transport is a particular sector in terms of workforce training cost. Because the number of employees in the sector is not high, the average monthly labour cost per employee for water transport sector exceeds the same cost for other sections of the national economy (statistics shown in Table 5).

In 2017, the average monthly labour cost per employee in the water transport sector is exceeded only by 7 out of 19 sections according to the NACE Rev.2 classification of national economic activity, such as mining and quarrying; electricity, gas, steam and air conditioning supply; information and communication; financial and insurance activities; professional, scientific and technical activities; public administration and defence and compulsory social security; and human health and social work activities.

This is favourable to the sector because wages are an important factor in the recruitment, selection and retention process in the labour market.
| X | Y | X to Y ratio of average monthly labour cost per employee |
|---|---|-----------------------------------------------------|
| | | 2008 | 2009 | 2010 | 2015 | 2016 | 2017 |
| A Agriculture, forestry and fishing | 182% | 173% | 189% | 161% | 156% | 131% |
| B Mining and quarrying | 59% | 52% | 70% | 55% | 63% | 56% |
| C Manufacturing | 155% | 152% | 156% | 129% | 134% | 113% |
| D Electricity, gas, steam and air conditioning supply | 63% | 62% | 66% | 70% | 78% | 70% |
| E Water supply; sewerage, waste management and remediation activities | 136% | 136% | 148% | 138% | 144% | 122% |
| F Construction | 139% | 161% | 172% | 157% | 167% | 143% |
| G Wholesale and retail trade; repair of motor vehicles and motorcycles | 160% | 169% | 168% | 144% | 150% | 123% |
| H Accommodation and food service activities | 215% | 222% | 252% | 210% | 210% | 174% |
| I Information and communication | 74% | 70% | 73% | 61% | 62% | 55% |
| J Financial and insurance activities | 50% | 54% | 59% | 55% | 63% | 56% |
| K Construction | 116% | 143% | 161% | 145% | 136% | 125% |
| L Real estate activities | 92% | 94% | 101% | 82% | 86% | 78% |
| M Professional, scientific and technical activities | 200% | 204% | 206% | 156% | 159% | 131% |
| N Administrative and support service activities | 92% | 108% | 129% | 95% | 100% | 77% |
| O Public administration and defence; compulsory social security | 105% | 107% | 140% | 118% | 125% | 102% |
| P Education | 112% | 112% | 138% | 124% | 114% | 83% |
| Q Human health and social work activities | 129% | 137% | 171% | 160% | 160% | 119% |
| R Arts, entertainment and recreation | 211% | 214% | 238% | 173% | 185% | 157% |

*Source: National Institute of Statistics, Tempo online database, FOMTIC*

With the globalization and opening up borders on the labour market, issues such as salary, professional development, environment and working conditions will have an important contribution in the employment decision. It is one of the economy’s sectors where technologies and innovations lead to the sustainable development of maritime and inland waterway transport as well as transport-related activities.

3. Conclusions

Romania’s importance on the map of European trade and the EU transport network can be understood by realizing the existing opportunities for the Constanța port through the flow of goods coming from China through the Eurasian and Central Asian countries that link Beijing with the Black Sea, as well as by the ancient silk road [7].

Romania could have a strategic role in the European area if it takes the advantages offered by geographic factors, energy capacity and the possibility of becoming a hub for maritime and inland waterway transport. By considering the Romanian need for an economy based on financing of all sectors with competitive potential in the EU market, the water transport sector can play an important role for the national, regional and local economy.

The growth trend of the number of companies providing services in the water transport sector is aligning with the trend throughout the globe. The local economy is based on the contribution made by
maritime and inland waterway transport enterprises, and this is highlighted by their high share in local enterprises.

The strategic role that Constanta Port has in the Black Sea region has been considered an asset in expanding cooperation and collaboration with similar ports interested in developing maritime transport projects. The asset proves the high competitiveness of Constanta Port in Europe, being one of the most developed maritime ports in this part of Europe.

Romania needs to adopt new strategies in the water transport sector to transition to a knowledge-based and digital economy.

4. References
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