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CHANGES IN THE RAILWAY NETWORK IN ROMANIA BEFORE AND AFTER ACCESSION TO THE EU (1990-2020)

Zmiany w sieci kolejowej w Rumunii przed i po akcesji do UE (1990-2020)

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Streszczenie: W pracy podjęto tematykę zmian w sieci kolejowej w Rumunii w latach 1990-2020. Podobnie jak w innych krajach cechuje ją regres, jednak w mniejszym stopniu niż w innych krajach regionu. Celem pracy jest wskazanie wielkości zachodzących zmian w ujęciu czterech poziomów przestrzennych: kraju, makroregionów, regionów rozwoju oraz rumuńskich województw. Kolejnym celem podjętej analizy jest ocena zmian jakości sieci kolejowej w badanym okresie. Postawiono dwie hipotezy badawcze – pierwszą o niewielkim wpływie funduszy UE na rozwój sieci kolejowej, drugą o braku wpływu finansowania z UE na zmiany jakości w transporcie kolejowym w Rumunii. W badaniach i analizie danych wykorzystano oficjalne, rumuńskie bazy statystyczne w zakresie zmian długości linii kolejowych w poszczególnych zakresach przestrzennych dla badanego okresu oraz dane z portalu „Ranking railroad, The Global economy" do oceny zmian jakości w transporcie kolejowym. W analizie zastosowano metody statystyczne i rankingi. Dla oceny zmian jakości wykorzystano metodę porównań z innymi krajami regionu. W pracy wykorzystano w szerokim zakresie literaturę przedmiotu, zarówno dotycząca badanego kraju jak i innych państw w regionach Europie Środkowej i Bałkanów. Podjęto weryfikację tezy o niewielkim wpływie funduszy UE na zmiany w sieci kolejowej, która została pozytywnie zweryfikowana. Wynikiem pracy jest wskazanie na zdecydowanie mniejszy regres w transporcie kolejowym w Rumunii, niż miał miejsce w innych krajach regionu. Największy wzrost długości linii kolejowych odnotowano we wschodnich regionach kraju oraz województwach przygranicznych, zwłaszcza na granicy z Węgrami. W analizowanym okresie jakość w transporcie kolejowym w praktyce nie uległa znaczącemu polepszeniu.

Słowa kluczowe: infrastruktura, jakość, sieć kolejowa, regres, Rumunia

Abstract: The work deals with the changes in the railway network in Romania in the years 1990-2020. As in other countries, it is characterized by regress, but to a lesser extent than in the countries of the region. The aim of the study is to indicate the size of the changes taking place in terms of four spatial levels: country, macroregions, development regions and Romanian counties. Another goal of the analysis undertaken is to assess changes in the quality of the railway network in the analyzed period. Two research hypotheses were put forward, the first one with a small impact of the EU funds on the development of the rail network, the second about the lack of impact of EU funding on changes in the quality of rail transport in Romania. In the research and data analysis, the official Romanian statistical databases on changes in the length of railway lines in individual spatial ranges for the analyzed period were used, as well as data from the „Ranking railroad, The Global economy" portal to assess quality changes in rail transport. Statistical methods and rankings were used in the analysis. The method of comparisons with other countries in the region was used to assess the quality changes. In the study, the literature on the subject was widely used, both concerning the studied country and other countries in the regions of Central Europe and the Balkans. The thesis about the low impact of EU funds on changes in the railway network, which has been positively verified, has been verified. The result of the study is an indication of a much smaller regress in rail transport in Romania than in other countries of the region. The greatest increase in the length of railway lines took place in the eastern regions of the country and in border counties, especially on the border with Hungary. In the analyzed period of time, the quality in rail transport did not improve significantly in practice.

Keywords: infrastructure, quality, railway network, regress, Romania

Introduction

Romania, a country in the Balkans, joined the EU at the beginning of 2007. Previously, other countries of the former socialist bloc became members of the EU, which operated in the Soviet (Russian) sphere of influence under the former Council for Mutual Economic Assistance. Complicated political transformation (Roth, 2016) in the first ten years did not bring about significant changes, neither in the political system nor in terms of economic reforms. The country was changing its political system and economic relations very slowly. In addition, in the last years of the last century, Romania and almost all of Europe were hit by a recession (Gatejel, Grama, 2019). Additionally, problems with the development of transport infrastructure in the following years were aggravated by corruption (Fazekas, Tóth, 2018). However, the accession process of Romania, thanks to the large-scale cross-border cooperation, especially in the euroregions (Wendt, 2004a), supported by EU funding for the development of the road network (Clitan, 2015), gave impetus to new investments in the field of railway infrastructure.

Apart from the limitations / possibilities of financing the expansion of the existing infrastructure, geographical conditions remain the main factor influencing its development, which in the case of Romania significantly impedes or increases the cost of building a railway infrastructure network (Istoria…, 2014). The country is located in a significant part of its territory in the south-eastern part of Europe, reaching the borders of the Black Sea coast. The Eastern and Southern Carpathian chains close the central part of Romania – Transylvania (Upland), constituting a barrier to the convenient development of transport lines. Like the Danube, it is a border river that separates the south of the country from Bulgaria. The foothills and highlands, crisscrossed by mountain rivers, located east and south of the Carpathians in Romanian Moldova and Wallachia, also do not facilitate the construction of a railway network, as does the Bihor Mountains, which partially enclose the Transylvania highlands from the west. The mountainous terrain, numerous valleys and the river network crossing them constitute a serious barrier to the development of railway lines, increasing the cost of both the expansion and improvement of the existing infrastructure.

Taking into account the geographical conditions of infrastructure development and, above all, the financial support for its development after Romania's accession to the EU within the framework of regional development funds and programs, an attempt was made to assess quantitative changes in the development of the railway network at the national and regional level. The aim of the conducted research is therefore to analyze the changes in the length of the railway network. It will allow to answer the question about the real impact of the accession to the EU on the development of the railway network in the country. The conducted, preliminary analysis of changes in the rail network allows us to formulate a hypothesis about the low impact of EU funds on the development of the railway network, or rather about stopping the pace of the progressive regress of the network. The latter, assuming that only the increase in the length of railway lines in the country is assessed, without analyzing the impact of EU funds on the modernization process. Another aim of the research, logically supplementing the undertaken analysis in some way, was the assessment of changes in the quality of the railway network. A hypothesis was also put forward that the impact of EU funds on the quality of the railway network would be low.

1. Research material and methods

For the purposes of the analysis, data was collected showing changes in the length of the Romanian railway network, broken down by country, macroregions, economic (development) regions and counties (judeţ). The data comes from official statistical summaries from the database "Baza de date statistice" (2021), from Tempo Online, from selected tables presenting changes in rail transport in Romania (table B15.4 rail transport). Data from 1990-2020 were selected for the analysis. The data on the basis of which the assessment of changes in the quality of railway networks was made come from the portal "„Ranking railroad" (2021), one of many world rankings (Donaubauer *et al*., 2014), which selected information presenting changes in the quality of the railway network in the longest available range temporal covering the period 2009-2019. The Railroad Quality Index is based on an aggregated opinion using answers to the question of rail quality in the portal's annual surveys in 144 countries (Ranking railroad, 2021).

In order to achieve the presented research objective and to verify the hypotheses, statistical methods were selected that allow to determine the percentage share of the change in the length of the railway network at selected spatial levels, similar to those used to assess changes in the road network in the studies published so far (Białek, Oleksiuk, 2011; Musiał-Malagó, 2013). The analysis of changes in the quality of the rail network was performed by simple compilation and comparison of quality changes in the analyzed period for the railway network.

In the first stage, data presenting the length of the railway network for three ten-year time periods was collected and compiled, broken down into four

spatial levels, including country (1), macroregions (4), development regions (8) and counties (40), one of the development region – Bucuresti, is the same as the capitol city and together with the Ilfov county (Fig. 1).

2. Literature review

Many studies have already been devoted to the development and changes of rail transport infrastructure,

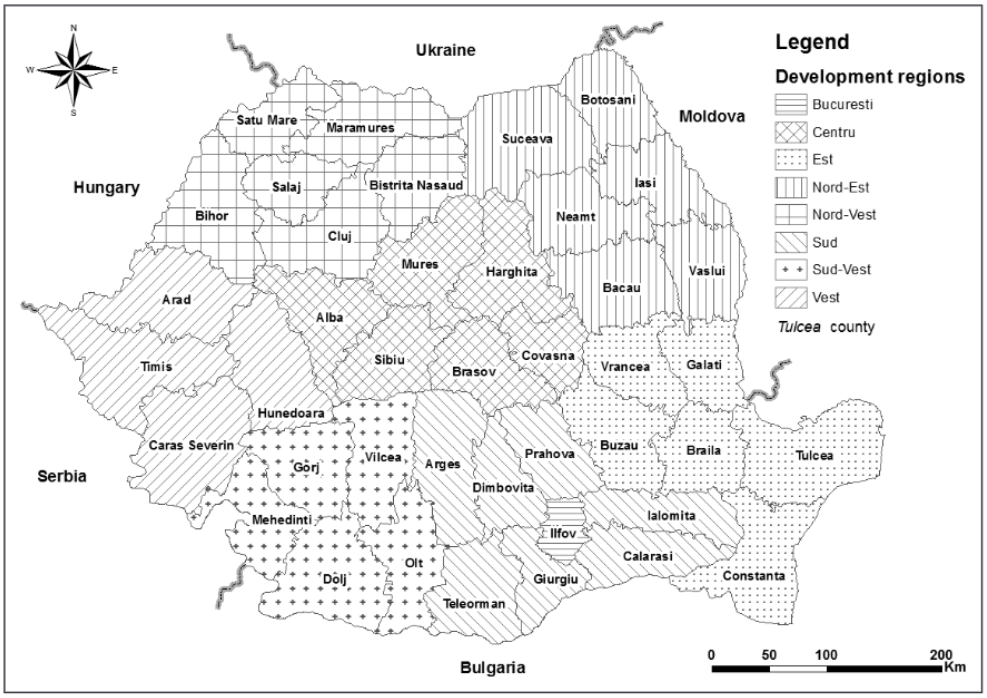

Fig. 1. Development Regions and counties in Romania.

Source: Máthé *et al.*, 2013, p. 82.

The years 1990-2000 present changes in the length of the railway and railway network in Romania in the period before accession to the EU, as part of the ongoing social, political and economic transformation and the accession process of Central European countries (Ilieş, Wendt, 2003). The next ten years show changes in the time when the inflow of financial resources under international programs and funds received under the euroregional cooperation (Ilieş *et al.,* 2009), mainly on the Romanian-Hungarian border. The last of the periods selected for the analysis covers the full period of the country's membership in the EU, i.e. the years 2010-2020. The analysis of changes in individual years made it possible to assess the rate of increase / decrease in the length of the railway network in terms of national and regional terms, allowing for the verification of the research hypothesis and the achievement of the objectives of the work. At the end of the analysis of changes in the network length, changes in the quality of infrastructure were indicated, which may determine other investment directions of EU funds, which could be used to improve the quality of infrastructure, and, ultimately, to transport people and cargo.

covering a number of issues, from transport accessibility (Komornicki *et al.*, 2010), through accessibility in tourist traffic (Wendt *et al.*, 2021) to the EU transport policy and its consequences for the development country (Szymanowski, 2015). As in the case of the development of railway networks in individual countries. Michniak (2015) wrote about the problems of the development of transport infrastructure in Slovakia, Oszter (2017) devoted his work to the subject of transport in Hungary, and Komornicki (2007) about Polish transport infrastructure in terms of the challenge to spatial cohesion. However, relatively little work has been devoted to modifying the Romanian railway network.

In the years 2000-2014, several works on the development of the railway network in this country were published in the Transport Geography Papers of Polish Geographical Society (Wendt, 2001, 2004b), as well as for other modes of transport. The problems of transport development in Romania in terms of the EU transport policy are discussed in the work of Ionescu (2012), while Wendt and Ilieş (2012) presented changes in the transport network in this country. Another work on a similar subject, co-authored by Ilieş and Wiskulski (2014), presents the regional diversity of the transport

network. In turn, Dobre indicated in his research the physical and geographical conditions of the development of transport infrastructure (2016), and Dumitrescu (2018) in a comparative analysis pointed to the strengths and weaknesses of transport in this country. However, work on rail transport is in the minority.

The quality of infrastructure, the assessment of which is one of the goals of the work, is most often assessed on the basis of surveys, in theoretical terms (de Oña et al., 2015), satisfaction ratings (Vicente *et al*., 2020) or passenger facilitation (Peng *et al*., 2017). However, works based on rankings, due to their general assessment and multivariate approach, are not very common in the literature. On the other hand, to show the general changes, it was found that they are sufficiently useful for the achievement of the aim of the study and the verification of the hypotheses (Donaubauer *et al.,* 2014). Taking into account the results of the research conducted so far, it can be concluded that the work undertaken for the entire research period constitutes a new approach to the title issue in the perspective of three time periods and at four spatial levels.

3. Result

On the basis of the collected data, it can be concluded (Tab. 1) that at the level of the entire country there was an over 5% decrease in the length of railway lines. The same is true for the three macroregions (1, 3, 4), where the decrease reached 26% (M1), 23% (M3) and 4% (M4), respectively. Only Macroregion 2 located in the east of the country, covering the Development regions North-East and South East, recorded a 20% increase in the length of railway lines. In the third level of the analysis, which covers the development regions, the South-Muntenia and Center regions have the greatest decrease in rail length, more than 20%. A decrease of 105-20% was recorded in the Bucharest-Ilfov region, and less than 10% was recorded in other regions. Only the North-East (9%) and South-East (32%) regions of the rail network increased.

Tab. 1. Railway lines and changes in their length in Romania, macroregions, regions and counties in 1990-2020.

Macroregions, development regions and counties	Railways (km)		Changes (%)			
	1990	2000	2000/1990	2010/2000	2020/2010	2020/1990
Romania total	11348	10769	97.07	97.91	99.85	94.90
MACROREGION 1	3566	3003	87.35	96.44	99.97	84.21
NORTH - WEST	1804	1663	91.19	101.40	99.70	92.18
Bihor	474	500	100.00	105.49	100.00	105.49
Bistrita-Nasaud	365	320	87.95	99.69	100.00	87.67
Cluj	259	239	89.58	103.45	99.58	92.28
Maramures	232	207	95.69	93.24	100.00	89.22
Satu Mare	298	214	73.83	99.09	98.17	71.81
Salaj	176	183	100.00	103.98	100.00	103.98
CENTER	1762	1340	83.43	90.88	100.30	76.05
Alba	315	231	79.37	92.00	100.43	73.33
Brasov	333	359	100.00	106.01	101.70	107.81
Covasna	115	116	100.00	100.87	100.00	100.87
Harghita	213	207	99.53	98.58	99.04	97.18
Mures	477	278	68.13	87.08	98.23	58.28
Sibiu	309	149	76.05	61.70	102.76	48.22
MACROREGION 2	2801	3359	101.21	118.84	99.70	119.92
NORTH - EAST	1481	1614	101.69	107.57	99.63	108.98
Bacau	226	221	100.00	97.79	100.00	97.79
Botosani	142	161	112.68	100.63	100.00	113.38

Iasi	284	290	102.11	100.00	100.00	102.11
Neamt	134	173	101.49	127.21	100.00	129.10
Suceava	445	520	99.78	118.47	98.86	116.85
Vaslui	250	249	100.00	99.60	100.00	99.60
SOUTH - EAST	1320	1745	100.68	131.60	99.77	132.20
Braila	168	158	100.00	94.05	100.00	94.05
Buzau	232	244	100.00	105.17	100.00	105.17
Constanta	392	776	102.30	193.52	100.00	197.96
Galati	291	303	98.97	105.56	99.67	104.12
Tulcea	68	103	104.41	149.30	97.17	151.47
Vrancea	169	161	100.00	95.27	100.00	95.27
MACROREGION 3	1993	1529	103.01	74.53	99.93	76.72
SOUTH - MUNTENIA	1671	1247	101.68	73.63	99.68	74.63
Arges	225	227	100.00	100.89	100.00	100.89
Calarasi	243	188	100.00	77.37	100.00	77.37
Dambovita	172	103	100.00	59.88	100.00	59.88
Giurgiu	113	47	100.00	41.59	100.00	41.59
Ialomita	276	293	100.00	106.16	100.00	106.16
Prahova	348	162	100.00	46.55	100.00	46.55
Teleorman	294	227	109.52	71.74	98.27	77.21
BUCHAREST- ILFOV	322	282	109.94	78.81	101.08	87.58
MACROREGION 4	2988	2878	100.80	95.68	99.86	96.32
SOUTH - WEST	1016	990	98.52	98.70	100.20	97.44
Dolj	221	227	100.00	101.81	100.89	102.71
Gorj	269	239	94.42	94.09	100.00	88.85
Mehedinti	129	124	100.00	96.12	100.00	96.12
Olt	233	237	100.00	101.72	100.00	101.72
Valcea	164	163	100.00	99.39	100.00	99.39
WEST	1972	1888	101.98	94.18	99.68	95.74
Arad	485	463	100.00	96.70	98.72	95.46
Caras-Severin	367	341	108.99	85.25	100.00	92.92
Hunedoara	333	289	102.10	85.00	100.00	86.79
Timis	787	795	99.87	101.15	100.00	101.02

Source: own study based on „Baza de date statistice", 2021.

At the counties (judeţ) level, the differences in line length changes are even greater. A decrease of more than 50% of the line length in 2020 compared to 1990 occurred in the Giurgiu, Prahova and Sibiu counties, and in the range from -5% to -50% in the next thirteen counties. There are seven territorial units at the national average (-5% to 0), with 17 out of 40 counties growing (Ilfov, formally country, together with the capital city of Bucharest constitute the Bucharest-Ilfov development region). Including the largest increase in the length of railway lines, over 20% took place in the counties: Neamt (29%), Tulcea (51%) and Contanca (98%).

Changes in the adopted ten-year research periods show that the largest decrease for the entire country took place in the years 2000-2010, i.e. in the period in which Romania joined the EU. The period preceding the accession was characterized by stagnation in terms of changes in the railway network, in half of the 40 counties there was no decrease or increase (Tab. 2).

period of full membership in the EU is characterized by a stabilization in the development of the railway network, with cautious optimism, as can be concluded on the basis of the data. Only in nine units there was a regress of the railway network, with an increase in counties, but in as many as 27 there were no changes. On the one hand, this indicates a certain stabilization, a halt to the pace of regress on Romanian railways, and on the other, it may also indicate that the cohesion funds are not fully used effectively for the expansion of the railway network.

Another issue and the aim of the research is to assess changes in the quality of Romanian railways. Based on the data from the database "„Ranking railroad, The Global economy", it can be concluded, assuming that 1 means low quality and 7 high quality, Romania was characterized by a low level of quality of railroads, as in 2009 it was only 2.73. Accession to the EU did not change its value in any fundamental

Tab. 2. Changes in the length of railway lines in selected time periods in Romania.

Changes	1990-2000	2000-2010	2010-2020	1990-2020
	The number of counties			
Decrease	12	22	9	23
No changes	20	1	27	0
Growth	8	17	4	17

Source: own study based on „Baza de date statistice", 2021.

It is worth noting that while in the years 2000-2010 the largest number of units recorded a regress, at the same time as many as 17 counties increased the length of railway lines, and only one did not change. The way. In 2019 it was 2.8, which can only be assessed as a slight change (Tab. 3).

For a better understanding in practice of the lack of changes in quality, which clearly proves the lack

Tab. 3. Indicator and changes in the quality of railways in Romania in the years 2009-2019.

Country	2009	2019	2019 / 2009 (%)
Bulgaria	2.94	3.10	105.4
Czechia	4.35	4.50	103.5
Hungary	3.36	3.80	113.1
Moldova*	2.60	3.00	115.4
Poland	2.89	3.90	134.9
Romania	2.73	2.80	102.6
Serbia	1.80	2.60	144.4
Slovakia	4.43	4.00	90.3
Ukraine	4.07	4.20	103.2

*2010

Source: own study based on *"Ranking railroad"*, 2021.

of real impact of EU funds or their improper use, it is worth looking at the changes that occurred in the same period in the quality of rail transport in the countries of the region, both in the EU and beyond. To begin with, it should be borne in mind that the average index of the quality of the railway network for the world was 3.61, for Europe 3.96 and for EU countries 4.18 (2019). Thus, in terms of quality, Romania is definitely among the countries with the lowest-quality rail network in the world, in Europe and in the EU.

The data showing the changes show that, for example, Serbia and Poland made good use of the years 2009-2019, increasing the quality by 44% and 35%, respectively (Tab. 3). Just like other countries belonging to the EU and remaining after it. In the analyzed period, only in the case of Slovakia there was a drop in quality by 10%. However, even after the decline, the railway network quality index was one of the highest among the countries of the region, reaching from 4.00 (2019). In general, all of the countries selected for analysis with indicators at the level of Romania or lower in 2009-2019 improved the quality of rail transport, the more so when they started from the lower level. The comparison of these changes may indicate a very low level of use of EU funds for the improvement of quality in rail transport in Romania in the analyzed period.

4. Discussion

The results of the analysis of changes in the length of railway lines in Romania, at the country level, show its slight regress (Tab. 1). In the scale of the whole country, statistically speaking, the network in the analyzed period 1990-2020 is shorter by 571 km (5.1%). The weak share of EU funds in the modernization of the railway system is also confirmed by research (Ban, Gog, 2021), which states in their work that only 0.6% of all Romanian railway lines were modernized with the use of EU funding. The greatest decrease took place in the years 1990-2000, and in the following decades the pace of decline was stopped, which is a phenomenon confirmed in studies conducted in Poland and the Czech Republic. As it results from the research of Taczanowski (2012), conducted for a comparable period of time (1989-2011), both in both countries we are dealing with the process of decommissioning a part of the railway network. However, it should be emphasized that the decline in Romania was much smaller, which may result, on the one hand, from the importance of rail transport in Romania and the costs of building and decommissioning the railway network in difficult geographical conditions of the nature of transport barriers (Wendt, 2004c). Orography and hydrography are much more important in this case than in Poland, or even in the Czech Republic (Dobre, 2016). For comparison, in Bulgaria, as shown in the literature (Dermendzhiev, Doykov 2019), the railway network did not change significantly in the first of the analyzed periods, but by 2018 it decreased by as much as 38%. This decline for the countries of the region, EU members, during the transformation period, is confirmed by the results of the research by Taczanowski (2012) for Poland, as well as detailed studies for industrial railways (Ciechański, 2013) and for the entire country, in the first years of transformation (Taylor, 2003, 2007), also Falkowski and Pytel (2014) obtained similar results, and Koziarski (2017) for the next ten years.

The largest decrease in the length of railway lines, over 50%, was recorded in the counties of Giurgiu, Prahova and Sibiu, located outside the main, international connections, which in the case of the latter is also confirmed by the results of studies for the entire region of Centru (Máthé *et al.,* 2013). However, in the case of other regions, located in the coastal zone, South-East development, counties Constanta, Tulcea, we have a clear increase in the length of railway lines for the transport of cargo traded in seaports, where, only in 2016-2019, there was an increase in transshipments at 14%. One can even risk a statement that the increase in transshipments in Romanian ports is the result of investments, which also result in an increase in the length of railway lines in the indicated regions (Studiu…, 2019). The second of the regions in which there has been a development of railway lines includes the development of the North-East region (Botosani, Suceva, Neamt, Iasi), including the so far poorly developed region of Romanian Moldova in terms of transport infrastructure. Changes in the length of railway lines in individual counties allow for the identification of development in areas covered by regional cooperation, such as Timis and Bihor (Wendt *et al*., 2021), which is also confirmed by the results of previous studies (Wendt, 2001, 2004b).

The analysis of changes in the length of railway lines in Romania, broken down into three ten-year periods, indicates a regress of the railway transport system in the first of the analyzed time periods, and then its stoppage and development, especially in the immediate period after the country's accession to the EU. Changes in the third period of the analysis are also confirmed by the data on the percentage distribution of EU funds allocated to the development or modernization of railway lines (Ban, Gog, 2021). Changes and modernization of the railway network also took place in other regions of the country, especially on cross-border railway sections, including the border with Hungary. Among the many completed projects, the EU Cohesion Fund financed the modernization of

the route from the Hungarian border to Constanca (Upgrades…, 2018). However, the improvements that allow to increase the speed of travel are not confirmed by the assessment of the quality of the railway network (Ranking Railroad, 2021).

For a complete analysis, it is also necessary to indicate the research limitations of the work. First of all, it includes the adopted research scheme and limiting the analysis to quantitative changes in the length of railway lines. And in the case of assessing changes in quality, selecting only one indicator that clearly prefers the overall quality assessment, without differentiating into the individual components that may constitute it. Undoubtedly, the limitation is the resignation from the research and analysis of numerous detailed modernization projects that were implemented on the Romanian railways thanks to the EU financial support and had an impact on the ongoing changes, but did not translate into an increase in the length of railway lines on a national scale, although they had a significant share in the slowdown the pace of regress of the railway network. The applied statistical methods allowed for the recognition of quantitative changes, however, apart from general conclusions, they did not allow for a detailed analysis of the title issue, but it was not the aim of the undertaken research. A detailed approach to the subject undoubtedly requires further work and goes beyond the general analysis planned in this section.

Conclusion

The conducted research, the analysis of the collected data and the literature on the subject made it possible to achieve the research goals planned in the work and to positively verify the hypotheses. The material and the conclusions made on the basis of it allow us to conclude that, similarly to other countries in the region of Central Europe and the Balkans (Bulgaria, the Czech Republic, Poland), in Romania there was a general reduction in the length of railway lines. However, in Romania (-5%) the decrease occurred to a lesser extent than in other countries of the region, which is confirmed by the research undertaken and the literature. In spatial terms, the regress affected the regions most outside the main international railway routes, especially in the counties of Giurgiu, Prahova and Sibiu (Tab. 1). The increase in the length of the railway network was recorded in the so far poorly developed East-North development region and in the South-East region, including the latter due to increased transport accessibility with Romanian ports (Constanca and Tulcea counties). As part of EU funds, some international connections were also modernized, including those on the border with Hungary. Changes in the length of railway lines in individual counties allow for the development of development in the areas covered by regional cooperation (Bihor, Timis), which is also confirmed by previous studies.

The analysis of changes in the three time profiles indicated in the study allowed for the conclusion that there was a greater regress of railway lines before Romania's accession to the EU and a decrease in the rate of regress after the country's accession to the EU (Tab. 2). In the first period (1990-2000), the decrease in the length of the railway lines covered twelve counties, and the increase only eight, but in the following years (2000-2010), with the increase in the number of counties with the regress of railway lines to twenty-two, an increase in the length of the railway network can be noted in subsequent years. seventeen. The last of the analyzed periods (2010-2020) is characterized by stabilization. Both the decline and the increase in length of railroads across counties have been halted, the former being recorded in only nine counties and the latter in four.

In the case of the analysis of quality changes in rail transport, the available data show no impact of the economic transformation process and how the EU funds can be concluded on the increase in quality, which only slightly improved over the analyzed period. A comparison of changes in the quality of rail transport in other countries of the region (Tab. 3) clearly shows a low rate of quality growth in Romanian transport compared to, for example, Serbia, Moldova, Poland and Hungary.

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