

Analysis of the Employed Population Evolution and of the Gross Domestic Product in Services, in the Western Region of Romania

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Abstract

The research has as objective to analyse the evolution of the employed population and the gross domestic product in services, in the Western Region of Romania, from 2016-2020, respectively to highlight the importance of the employed population's contribution to the creation of the gross domestic product.

Based on the statistical data series, the absolute, relative and average indicators were calculated, with the aim of identifying for each type of service the increase, the dynamics index and the rate of growth of the employed population and the gross domestic product, both in absolute values and in values mediums.

The employed population and the gross domestic product registered positive values for most services, and negative values only for the population employed in Financial Intermediation and Insurance services, Other service activities, Education, Public Administration and Defence; social insurance from the public system, as well as to the gross domestic product for Real Estate Transaction services and Financial Intermediation and Insurance services.

Key words: employed population, gross domestic product, services, increase, index, rhythm, calculation algorithm

J.E.L. classification: L8, R11

1. Introduction

In order to identify the contribution of the population employed in services, in the Western Region of Romania, to the growth of the gross domestic product, in the period 2016-2020, a statistical series on the evolution over time of the population employed in services and the gross domestic product at the level of the Western Region was built, on the basis of which the absolute, relative and average indicators were calculated, for the population employed in services at the level of the Western Region, for the analysed period, in order to be able to draw concrete conclusions.

The development of the national economy is based on the regional development of a country, which is exactly why Braşoveanu stated that the world has witnessed unparalleled regional development over the past few decades, driven by factors such as rapid urbanization, industrialization, and globalization” (Braşoveanu, 2023, p. 42).

The contribution of a population to the creation of the gross domestic product is very important at the national level, supporting the economic development of the country.

2. Theoretical background

Specialty literature underlines the fact that the gross domestic product is a macro-economic aggregate indicator of the national accounts, being considered the main indicator by which the development and growth of the national economy is measured. This indicator represents the final value of all goods and services produced in the national economy over a period of one year. But these goods and services are produced by development regions of the national economy and by sectors of activity.

The last year that was analysed is the first year of the pandemic period - 2020, which is precisely why it is considered that “stimulating economic growth in times of crisis goes hand in hand with increasing social needs. The process of economy capitalizing is necessary in conjunction with the development of services (social and employment services), otherwise income inequality may affect social security” (Belciug, 2022, p 471).

Being an important indicator for the development of the national economy, “the employed population includes all individuals - both employees and self-employed - who exercise a productive activity within the production limits of the European System of Accounts” (Anghelache, 2012, p. 21).

In the services domain one could observe interdependencies between the actual production process of the services, according to the consumers’ needs. Consumer demand for services is based on “the needs imposed by the individuals’ lives and by the society” (Silași, 2007, p. 14), these being satisfied according to existing resources.

Taking into account the fact that in recent years the demand for most types of services is increasing, this has led to the development of the tertiary sector size.

The most important indicators used in determining the dimensions of the tertiary sector are:

- ✓ “the share of the employed population in the service sector, depending on the total employed population, an indicator that is important for the human resource used in the production of services;
- ✓ the contribution of services to the creation of GDP, in the sense that the average growth rate of GDP created in services is higher than that of total GDP;
- ✓ the number of economic and social agents active in the national economy, respectively the number of active enterprises by sector and branch;
- ✓ the size and structure of tangible assets, an indicator that shows the size of the material resources used in the service sector and their ratio with the other sectors;
- ✓ the size of investments and their structure, an indicator used to identify the efforts made for the creation of new fixed assets or for the development, modernization and reconstruction of the existing ones in the service sector, compared to the other sectors.”(Ionciã, 2000, p.44-56).

Thus, services contribute to the economic-social development and the increase in the quality of life, which generates the growth of the national economy.

3. Research methodology

In order to analyse the evolution of the employed population and the gross domestic product in services, in the Western Region of Romania, in the period 2016-2020, the series including statistical data was taken from the National Institute of Statistics (<https://insse.ro/cms/ro/tags/repere-economice-si-sociale-regionale>).

In order to be able to realized =the analysis of the evolution of the employed population and the gross domestic product in the Western Region of Romania, in the period 2016-2020, = a quantitative research method was used, namely the study of the series of statistical data chronologically, for which the absolute, relative and average indicators of the series were used as a method of analysis (Ciurea, 2006), (Gherghina, 2010) *to highlight the trend of the employed population and the gross domestic product, in services, in the Western Region of Romania, in the period 2016-2020.*

For the absolute indicators, the series of statistical data (y_i) is used, according to which the absolute changes were calculated, respectively: the increase with fixed base score $\Delta_{i/1} = y_i - y_1$ (1) and a chain linking score $\Delta_{i/i-1} = y_i - y_{i-1}$ (2). For relative indicators, the fixed base dynamics index was calculated $I_{i/1} = \frac{y_i}{y_1}$ (3) and the chain linking dynamics index $I_{i/i-1} = \frac{y_i}{y_{i-1}}$ (4), as well as the fixed base growth rate $R_{i/1} = I_{i/1} - 1$ (5) and the chain linking growth rate $R_{i/i-1} = I_{i/i-1} - 1$ (6). Average indicators were calculated from absolute values, respectively the average of the series

$\bar{y} = \frac{\sum_{i=1}^n y_i}{n}$ (7), average growth $\bar{\Delta} = \frac{y_n - y_1}{n-1}$ (8) and from relative values, respectively the average evolution index $\bar{I} = \sqrt[n]{\frac{y_n}{y_1}}$ (9), the average rate of evolution $\bar{R} = \bar{I} - 1$ (10).

4. Findings

The results of the research on the analysis of the employed population evolution and the gross domestic product in services, in the Western Region of Romania, in the period 2016-2020 are presented below:

4.1. Analysis of the evolution of the population employed in services, in the Western Region of Romania, in the period 2016-2020

Based on the statistical data series of the employed population at the level of the Western Region of Romania, presented in the table below as absolute level indicators, the indicators of absolute changes, relative indicators and average indicators were calculated

Table no. 1 The centralizer of the calculation algorithm of the population employed in services, in the Western Region of Romania, in the period 2016-2020

Years	ABSOLUTE INDICATORS (thousands of people)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATED FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
		Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate	chain linking rate	Series average	Score average	Index average
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
1. Wholesale and retail trade; motor vehicle and motorcycle repair											
2016	123.4	0	-	1	-	0	-	124.38	0.80	1.0070	0.0070
2017	122.5	-0.90	-0.90	0.9927	0.9927	-0.0073	-0.0073				
2018	122.5	-0.90	0.00	0.9927	1.0000	-0.0073	0.0000				
2019	126.9	3.50	4.40	1.0284	1.0359	0.0284	0.0359				
2020	126.6	3.20	-0.30	1.0259	0.9976	0.0259	-0.0024				
2. Transport and storage											
2016	45.3	0	-	1	-	0	-	48.14	1.28	1.0270	0.0270
2017	47.4	2.10	2.10	1.0464	1.0464	0.0464	0.0464				
2018	48.8	3.50	1.40	1.0773	1.0295	0.0773	0.0295				
2019	48.8	3.50	0.00	1.0773	1.0000	0.0773	0.0000				
2020	50.4	5.10	1.60	1.1126	1.0328	0.1126	0.0328				
3. Hotels and restaurants											
2016	17.6	0	-	1	-	0	-	18.84	0.35	1.0193	0.0193
2017	18.6	1.00	1.00	1.0568	1.0568	0.0568	0.0568				
2018	19.2	1.60	0.60	1.0909	1.0323	0.0909	0.0323				
2019	19.8	2.20	0.60	1.1250	1.0313	0.1250	0.0313				
2020	19.0	1.40	-0.80	1.0795	0.9596	0.0795	-0.0404				
4. Information and Communications											
2016	17.2	0	-	1	-	0	-	19.56	1.15	1.0610	0.0610
2017	18.9	1.70	1.70	1.0988	1.0988	0.0988	0.0988				
2018	19.8	2.60	0.90	1.1512	1.0476	0.1512	0.0476				

Years	ABSOLUTE INDICATORS (thousands of people)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATED FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate	chain linking rate	Series average	Score average	Index average	Growth average rate
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
2019	20.1	2.90	0.30	1.1686	1.0152	0.1686	0.0152				
2020	21.8	4.60	1.70	1.2674	1.0846	0.2674	0.0846				
5. Financial intermediation and insurance											
2016	9.2	0	-	1	-	0	-	6.98	-0.73	0.9097	-0.0903
2017	6.7	-2.50	-2.50	0.7283	0.7283	-0.2717	-0.2717				
2018	6.2	-3.00	-0.50	0.6739	0.9254	-0.3261	-0.0746				
2019	6.5	-2.70	0.30	0.7065	1.0484	-0.2935	0.0484				
2020	6.3	-2.90	-0.20	0.6848	0.9692	-0.3152	-0.0308				
6. Real estate transactions											
2016	3.3	0	-	1	-	0	-	3.02	-0.02	0.9923	-0.0077
2017	2.8	-0.50	-0.50	0.8485	0.8485	-0.1515	-0.1515				
2018	2.9	-0.40	0.10	0.8788	1.0357	-0.1212	0.0357				
2019	2.9	-0.40	0.00	0.8788	1.0000	-0.1212	0.0000				
2020	3.2	-0.10	0.30	0.9697	1.1034	-0.0303	0.1034				
7. Professional, scientific and technical activities											
2016	13.7	0	-	1	-	0	-	14.62	0.43	1.0297	0.0297
2017	13.9	0.20	0.20	1.0146	1.0146	0.0146	0.0146				
2018	14.7	1.00	0.80	1.0730	1.0576	0.0730	0.0576				
2019	15.4	1.70	0.70	1.1241	1.0476	0.1241	0.0476				
2020	15.4	1.70	0.00	1.1241	1.0000	0.1241	0.0000				
8. Administrative service and support service activities											
2016	25.7	0	-	1	-	0	-	25.94	0.03	1.0010	0.0010
2017	25.7	0.00	0.00	1.0000	1.0000	0.0000	0.0000				
2018	26.2	0.50	0.50	1.0195	1.0195	0.0195	0.0195				
2019	26.3	0.60	0.10	1.0233	1.0038	0.0233	0.0038				
2020	25.8	0.10	-0.50	1.0039	0.9810	0.0039	-0.0190				
9. Public administration and national defence; social insurance from the public system											
2016	17.7	0	-	1	-	0	-	17.80	-0.05	0.9972	-0.0028
2017	17.9	0.20	0.20	1.0113	1.0113	0.0113	0.0113				
2018	17.8	0.10	-0.10	1.0056	0.9944	0.0056	-0.0056				
2019	18.1	0.40	0.30	1.0226	1.0169	0.0226	0.0169				
2020	17.5	-0.20	-0.60	0.9887	0.9669	-0.0113	-0.0331				
10. Education											
2016	36.2	0	-	1	-	0	-	35.76	-0.33	0.9909	-0.0091
2017	36.5	0.30	0.30	1.0083	1.0083	0.0083	0.0083				
2018	36.1	-0.10	-0.40	0.9972	0.9890	-0.0028	-0.0110				
2019	35.1	-1.10	-1.00	0.9696	0.9723	-0.0304	-0.0277				
2020	34.9	-1.30	-0.20	0.9641	0.9943	-0.0359	-0.0057				
11. Health and social care											
2016	39.6	0	-	1	-	0	-	42.38	1.63	1.0387	0.0387
2017	40.9	1.30	1.30	1.0328	1.0328	0.0328	0.0328				
2018	42.0	2.40	1.10	1.0606	1.0269	0.0606	0.0269				

Years	ABSOLUTE INDICATORS (thousands of people)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATED FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate	chain linking rate	Series average	Score average	Index average	Growth average rate
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
2019	43.3	3.70	1.30	1.0934	1.0310	0.0934	0.0310				

Years	ABSOLUTE INDICATORS (thousands of people)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATED FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate	chain linking rate	Series average	Score average	Index average	Growth average rate
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
2020	46.1	6.50	2.80	1.1641	1.0647	0.1641	0.0647				

12. Performing, cultural and recreational activities

2016	5.5	0	-	1.0000	-	0.0000	-	5.72	0.05	1.0090	0.0090
2017	5.4	-0.10	-0.10	0.9818	0.9818	-0.0182	-0.0182				
2018	6.0	0.50	0.60	1.0909	1.1111	0.0909	0.1111				
2019	6.0	0.50	0.00	1.0909	1.0000	0.0909	0.0000				
2020	5.7	0.20	-0.30	1.0364	0.9500	0.0364	-0.0500				

13. Other service activities

2016	19.0	0	-	1	-	0	-	16.88	-0.83	0.9534	-0.0466
2017	17.2	-1.80	-1.80	0.9053	0.9053	-0.0947	-0.0947				
2018	16.8	-2.20	-0.40	0.8842	0.9767	-0.1158	-0.0233				
2019	15.7	-3.30	-1.10	0.8263	0.9345	-0.1737	-0.0655				
2020	15.7	-3.30	0.00	0.8263	1.0000	-0.1737	0.0000				

14. Construction

2016	50.0	0	-	1.0000	-	0.0000	-	51.40	0.78	1.0152	0.0152
2017	51.0	1.00	1.00	1.0200	1.0200	0.0200	0.0200				
2018	50.7	0.70	-0.30	1.0140	0.9941	0.0140	-0.0059				
2019	52.2	2.20	1.50	1.0440	1.0296	0.0440	0.0296				
2020	53.1	3.10	0.90	1.0620	1.0172	0.0620	0.0172				

Source: made by the author based on the statistical data series available on

<https://insse.ro/cms/ro/tags/repere-economicice-si-sociale-regionale>

The evolution or dynamics of the employed population by type of services, at the level of the Western Region of Romania, depending on the dynamics index and the growth rate, recorded a positive trend for several types of services during the entire period analysed 2016-2020, the first place being the population employed in Information and communication services, this type of service registering a continuous evolution from 17.2 thousand people in 2016 to 21.8 thousand people in 2020, the average of the series being 19.56 thousand people, the average score of 1.15 thousand people, average dynamics index of 1.0610 and a growth rate of 0.0610.

The second place among the types of services analysed is taken by Health and social assistance services, with a continuous evolution of the employed population, from 39.6 thousand people in 2016 to 46.1 thousand people in 2020, the series average being 42.38 thousand people, the average growth of 1.63 thousand people, the average dynamics index of 1.0387 and an average growth rate of 0.0387.

The third place among the types of services analysed is held by the services of Professional, scientific and technical activities, with a continuous evolution of the employed population, from 13.7 thousand people in 2016 to 15.4 thousand people in 2020, the series average being 14.62 thousand people, the growth average of 0.43 thousand people, the average dynamics index of 1.0297 and an average growth rate of 0.0297.

The fourth place is occupied by Transport and storage services with a continuous evolution of the employed population, from 45.3 thousand people in 2016 to 50.4 thousand people in 2020, the average of the series being 48.14 thousand people, the average score of 1.28 thousand people, the index dynamic average of 1.0270 and an average growth rate of 0.0270.

The fifth place is occupied by hotels and restaurants services with a dynamic evolution, from 17.6 thousand people in 2016 to 19.0 thousand people in 2020, the average of the series being 18.84 thousand people, the average score of 0.35 thousand people, the average index of dynamics of 1.0193 and an average growth rate of 0.0193.

Buildings, as services domain, with an occupied population dynamics, from 50 thousand people in 2016 to 53.1 thousand people in 2020, are positioned on the sixth place, the average of the series being 51.40 thousand people, the average increase score of 0.78 thousand people, the average dynamics index of 1.0152 and an average growth rate of 0.0152.

The seventh place is occupied by the services of Performing, cultural and recreational activities with a busy population dynamic, from 5.5 thousand people in 2016 to 5.7 thousand people in 2020, the series average being 5.72 thousand people, the average increase score of 0.05 thousand persons, the average dynamics index of 1.0090 and an average growth rate of 0.0090.

Although the population employed in wholesale and retail services registers the highest value; the repair of motor vehicles and motorcycles is positioned on the eighth place, registering a continuous evolution over the entire analysed period from 123.4 thousand people in 2016 to 126.9 thousand people in 2020, the series average being 124.44 thousand people, the average increase score of 0.88 thousand people, the index dynamics average of 1.0070 and an average growth rate of 0.0070.

Administrative service activities and support service activities occupy the ninth position, registering a dynamics from 25.7 thousand people in 2016 to 25.8 thousand people in 2020, the of series average being 25.94 thousand people, the average increase score of 0.03 thousand people, the dynamics index average of 1.0010 and an average growth rate of 0.0010.

Although the average of the series of statistical data is positive for all services, there is an average increase score and an average negative growth rate for the following types of services: Financial intermediation and insurance (average increase score of -0.73 thousand people and average growth rate of -0.0903), Other service activities (average increase score of -0.83 thousand people and average growth rate of -0.0466), Education (average increase score of -0.33 thousand people and average growth rate of -0.0091), Real estate transactions (average increase score of -0.02 thousand people and average growth rate of -0.0077), Public Administration and Defence; social insurance from the public system (the average increase score of -0.05 thousand people and the average growth rate of -0.0028).

4.2. Analysis of the evolution of the gross domestic product in services, in the Western Region of Romania, in the period 2016-2020

The values of the gross domestic product in current prices (<https://insse.ro/cms/ro/tags/repere-economice-si-sociale-regionale>), were calculated according to constant prices using the annual indices of consumer prices in services, with the reference period being 2016 (100%), compared to the 2017 (99.23%), 2018 (101.74%), 2019 (105.68%), 2020 (108.95%) (<http://statistici.insse.ro/shop/?page=ipcal&lang=ro>), the values being listed to the absolute level indicators, in the table below.

The indicators of absolute changes, relative indicators and average indicators based on the statistical data series of the gross domestic product in constant prices at the level of the Western Region of Romania are presented in the table below as absolute indicators level.

Table no. 2 The centralizer of the calculation algorithm of the gross domestic product in services, in the Western Region of Romania, during the period 2016-2020

Years	ABSOLUTE INDICATORS (constant prices million lei)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATE D FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate		Data series	fixed base score	chain linking score	fixed base index
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
1. Wholesale and retail trade; motor vehicle and motorcycle repair; transport and storage; hotels and restaurants											
2016	13164.10	0	-	1	-	0	-	16185.42	1121.89	1.0761	0.0761
2017	15561.12	2397.02	2397.02	1.1821	1.1821	0.1821	0.1821				
2018	16759.68	3595.58	1198.56	1.2731	1.0770	0.2731	0.0770				
2. Information and communications											
2016	3086.20	0	-	1	-	0	-	4308.11	570.17	1.1483	0.1483
2017	4020.66	934.46	934.46	1.3028	1.3028	0.3028	0.3028				
2018	4130.63	1044.43	109.97	1.3384	1.0274	0.3384	0.0274				
2019	4936.22	1850.02	805.60	1.5994	1.1950	0.5994	0.1950				
2020	5366.87	2280.67	430.64	1.7390	1.0872	0.7390	0.0872				
3. Financial intermediation and insurance											
2016	1484.50	0	-	1	-	0	-	1172.18	-70.37	0.9488	-0.0512
2017	1161.85	-322.65	-322.65	0.7827	0.7827	-0.2173	-0.2173				
2018	1017.10	-467.40	-144.74	0.6851	0.8754	-0.3149	-0.1246				
2019	994.42	-490.08	-22.69	0.6699	0.9777	-0.3301	-0.0223				
2020	1203.03	-281.47	208.61	0.8104	1.2098	-0.1896	0.2098				
4. Real estate transactions											
2016	7402.00	0	-	1	-	0	-	7180.16	-103.37	0.9857	-0.0143
2017	6713.80	-688.20	-688.20	0.9070	0.9070	-0.0930	-0.0930				
2018	6845.00	-557.00	131.20	0.9247	1.0195	-0.0753	0.0195				
2019	7951.46	549.46	1106.46	1.0742	1.1616	0.0742	0.1616				
2020	6988.53	-413.47	-962.93	0.9441	0.8789	-0.0559	-0.1211				
5. Professional, scientific and technical activities; administrative service activities and support service activities											
2016	2945.40	0	-	1	-	0	-	3988.55	338.75	1.0992	0.0992
2017	3990.43	1045.03	1045.03	1.3548	1.3548	0.3548	0.3548				
2018	3990.47	1045.07	0.04	1.3548	1.0000	0.3548	0.0000				
2019	4716.03	1770.63	725.56	1.6012	1.1818	0.6012	0.1818				
2020	4300.41	1355.01	-415.62	1.4600	0.9119	0.4600	-0.0881				
6. Public administration and defence; social insurance from the public system; education; health and social assistance											
2016	7490.70	0	-	1	-	0	-	10687	1342	1.144	0.144

Years	ABSOLUTE INDICATORS (constant prices million lei)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATE D FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate		Data series	fixed base score	chain linking score	fixed base index
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
2017	9425.07	1934.37	1934.37	1.2582	1.2582	0.2582	0.2582				
2018	11116.18	3625.48	1691.11	1.4840	1.1794	0.4840	0.1794				
2019	12545.04	5054.34	1428.86	1.6747	1.1285	0.6747	0.1285				
2020	12858.93	5368.23	313.88	1.7167	1.0250	0.7167	0.0250				
7. Performing, cultural and recreational activities; household product repairs and other services											
2016	1930.00	0	-	1	-	0	-	2417.36	90.49	1.0439	0.0439
2017	2415.80	485.80	485.80	1.2517	1.2517	0.2517	0.2517				
2018	2673.19	743.19	257.38	1.3851	1.1065	0.3851	0.1065				
2019	2775.83	845.83	102.65	1.4383	1.0384	0.4383	0.0384				
2020	2291.97	361.97	-483.86	1.1875	0.8257	0.1875	-0.1743				
8. Constructions											
2016	3096.70	0	-	1	-	0	-	3568.88	290.74	1.0830	0.0830
2017	3109.14	12.44	12.44	1.0040	1.0040	0.0040	0.0040				
2018	3326.03	229.33	216.89	1.0741	1.0698	0.0741	0.0698				

Years	ABSOLUTE INDICATORS (constant prices million lei)			RELATIVE INDICATORS (%)				AVERAGE INDICATORS			
	LEVEL	ABSOLUTE MODIFICATIONS		DYNAMICS INDEX		GROWTH RATE		CALCULATE D FROM ABSOLUTE VALUES		CALCULATE FROM RELATIVE VALUES	
	Data series	fixed base score	chain linking score	fixed base index	chain linking index	fixed base rate		Data series	fixed base score	chain linking score	fixed base index
	y_i	$\Delta_{i/1}$	$\Delta_{i/-1}$	$I_{i/1}$	$I_{i/i-1}$	$R_{i/1}$	$R_{i/i-1}$	\bar{y}	$\bar{\Delta}$	\bar{I}	\bar{R}
2019	4052.90	956.20	726.87	1.3088	1.2185	0.3088	0.2185				
2020	4259.66	1162.96	206.76	1.3755	1.0510	0.3755	0.0510				

Source: made by the author based on the statistical data series and consumer price indices in services, available on

[https://insse.ro/cms/ro/tags/repere-economiche-si-sociale-regionale;](https://insse.ro/cms/ro/tags/repere-economiche-si-sociale-regionale)
<http://statistici.insse.ro/shop/?page=ipca1&lang=ro>

At the level of the Western Region of Romania, for the period 2016-2020, the evolution or dynamics of the gross domestic product in constant or comparable prices, by types of services, for the entire analysed period, depending on the dynamics index and the growth rate, had a trend positive in several types of services, with Information and communication services on the first place with a continuous evolution from 3086.2 million lei in 2016 to 5866.87 million lei in 2020, with the series average of 4308.11 million lei, the average increase score of 570.17 million lei, the average dynamics index of 1.1483 and an average growth rate of 0.1483.

On the second place one could observe the public administration and defence services; social insurance from the public system; education; health and social assistance with a continuous evolution, from 7490.7 million lei in 2016 to 12858.93 million lei in 2020, the series average of 10687.18 million lei, the average increase score of 1342.06 million lei, the average dynamics index of 1.1446 and an average growth rate of 0.1446.

The third place when analysing its evolution is occupied by the services of professional, scientific and technical activities; administrative services activities and support services activities, with an evolution, from 2945.4 million lei in 2016 to 4300.41 million lei in 2020, the series average of 3988.55 million lei, the average increase score of 338.75 million lei, the average dynamics index of 1.0992 and an average growth rate of 0.0992.

On the fourth place the Construction services are situated with an evolution over the entire analysed period, from 3096.7 million lei in 2016 to 4259.66 million lei in 2020, the series average of 3568.88 million lei, the average increase score of 290.74 million lei, the average dynamics index of 1.0830 and an average growth rate of 0.0830.

Although the wholesale and retail trade services register the highest absolute level values; motor vehicle and motorcycle repair; transport and storage; hotels and restaurants, register a continuous evolution, from 13164.1 million lei in 2016 to 17651.68 million lei in 2020, the series average of 16185.42 million lei, the average increase score of 1121.89 million lei, the average dynamics index of 1.00761 and an average growth rate of 0.0761, which is why they are positioned on the fifth place.

Performing, cultural and recreational activities; repairs of household products and other services are positioned in sixth place, experiencing a dynamic throughout the analysed period, starting from 1930.0 million lei in 2016, reaching 2291.97 million lei in 2020, having a series average of 2417.36 million lei, the average increase score of 90.49 million lei, the average dynamics index of 1.0439 and an average growth rate of 0.0439.

A negative trend was recorded in Real Estate Transactions services, which had a dynamic from 7402.0 million lei in 2016 to 6988.53 million lei in 2020, the series average of 7180.16 million lei, the average increase score being negative -103.37 million lei, the average dynamics index of 0.9857 and an average growth rate of -0.0143, which is why these services are positioned on the seventh place.

A negative record was also identified in Financial Intermediation and Insurance services, from 1484.50 million lei in 2016 to 1203.03 million lei in 2020, the series average being negative: -70.37 million lei, the average dynamics index of 0.9488 and an average growth rate of -0.0512, which is why these services are positioned on the eighth place.

5. Conclusions

Based on the analysis, over the entire analysed period, 2016-2020, part of the population employed (thousands of people) in services registered a continuous evolution in the services of: Wholesale and retail trade; motor vehicle and motorcycle repair; Transport and storage; Information and communications; Professional, scientific and technical activities; Health and social care.

Regarding the other types of services, a dynamic is observed in: Hotels and restaurants, Financial intermediation and insurance; Real estate transactions; Administrative service activities and support service activities; Public administration and defence; social insurance from the public system; Education; Cultural and recreational performance activities; Other service activities, as well as Construction.

According to the average value of the series of statistical data, the first six places at the level of the Western Region in 2020 are occupied by Wholesale and retail trade; motor vehicle and motorcycle repair (124.44 thousand people), followed by Construction (51.40 thousand people), Transport and storage (48.14 thousand people), Health and social assistance (42.38 thousand people), Education (35.76 thousand people), as well as Service Activities administrative and support services activities (25.94 thousand people).

Regarding the value of GDP in millions of lei at constant prices, for the entire analysed period 2016-2020, it records a continuous evolution for Wholesale and Retail Trade services; motor vehicle and motorcycle repair, transport and storage, hotels and restaurants; followed by Public Administration and Defence; social insurance from the public system; education; health and social assistance; Information and communications; Professional, scientific and technical activities; administrative service activities and support service activities; Constructions.

Regarding the gross domestic product in constant prices, for the other types of services, a dynamic is observed in: Real estate transactions; Performing, cultural and recreational activities; repairs of household products and other services, the last place being occupied by Financial Intermediation and Insurance.

At the level of the Western Region, in 2020 the highest value of the gross domestic product, in current prices, for the first six places is recorded in wholesale and retail trade services; motor vehicle and motorcycle repair; transport and storage; hotels and restaurants (17,651.68 million lei), followed by Public Administration and Defence; social insurance from the public system; education; health and social assistance (12858.93 million lei), respectively Real estate transactions (6988.53 million lei), Information and communications (5366.87 million lei), Professional, scientific and technical activities; administrative services activities and support services activities (3988.55 million lei), Construction (4640.9 million lei). The last two places are occupied by performance, cultural and recreational activities services; repairs of household products and other services (2417.36 million lei), Financial intermediation and insurance (1172.18 million lei).

One can appreciate that the contribution of the population employed in services to the growth of the gross domestic product in the Western Region of Romania was significant throughout the analysed period.

The results of this study will form the basis of future more in-depth research or comparisons with other research realized in the field of study.

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