

UDK
314.116(497.713)“2002/2021”
330.55(497.713)“2010/2021”
(Original scientific paper)

NATASHA DANILOSKA*
DIANA BOSHKOVSKA**

DEMOGRAPHIC CHANGES AND ECONOMIC ACTIVITY IN THE VARDAR REGION

Abstract

The results of the 2021 Census of Population, Households and dwellings showed that in the first decades of the 21st century in the Republic of North Macedonia, there was a decline in the total resident population and hinted at unfavorable demographic changes. These changes will undoubtedly have implications for the future development of the population, socio-economic and regional development.

In this paper¹, through available data from secondary sources, the Vardar region is analyzed as one of the eight non-administrative units-statistical regions in the Republic of North Macedonia. The available human resources and their economic characteristics (working age population and labor force) are perceived from the data of the two consecutive censuses 2002 and 2021. Also, some indicators of the economic activity of the Vardar region are analyzed (GDP per capita, GDP index, Gross value added by sectors of activity, Gross fixed capital formation by sector of activity and number of active enterprises) for the period 2010-2021. The identified changes of the basic demographic and socio-economic characteristics of the population and economic activity in the Vardar region can serve in the creation of appropriate policies, measures and activities for its development.

* Ph.D. full time professor, University of “Ss. Cyril and Methodius“, Institute of economics-Skopje, natasha.daniloska@ek-inst.ukim.edu.mk

** Ph.D. full time professor, University of “Ss. Cyril and Methodius“, Institute of economics-Skopje, diana@ek-inst.ukim.edu.mk

1 The research was conducted for the purposes of the project: *Demographic changes in the Republic of North Macedonia in the context of the population Census in the 2021 census - causes, consequences and implications*, financed by the University of Ss. Cyril and Methodius-Skopje, Republic of North Macedonia

Key words: Vardar region, population, demographic changes, socio-economic indicators

JEL classification: J11, J21

Introduction

In the RN Macedonia, a period of 20 years passed between the two last censuses of 2002 and 2021. That in itself is an incentive to analyze the demographic changes that occurred during this time period. In this paper, Vardar region as one of the eight statistical regions in the RN Macedonia is analyzed.

The analyzes begins with comparison of the demographic changes that occurred in this region between two censuses of 2002 and 2021. The changes in the total population and the population density, then the number and percentage share of the population by age groups and educational attainment, rates of activity, as well as the employment and unemployment rates are observed. The analysis was done on three levels (at national level, at Vardar region level and by municipalities in the region), which allows a multi-purpose comparison of the data. This enables evaluation of the situation in the region in relation to the country, and state of the municipalities in relation to the region and between themselves.

In the second part, the region's economic activity is analyzed in comparison to the national level activity. Several indicators are used such as GDP per capita, GDP index, Gross value added by sectors of activity, Gross fixed capital formation by sectors of activity and the number of active enterprises.

The purpose of this analysis is to determine the interaction between demographic changes and economic activity in the Vardar region. The research relies solely on secondary data and hence some limitations arise. Some refer to demographic data and result from methodological changes from one census to another, which make it impossible to make a direct comparison of certain data from the Population Censuses for 2002 and 2021. Another limitation refers to the fact that the indicators for economic activity are taken from the annual regional publications that have been issued since 2009, in which aggregated data for the regions are published, but not for the constituting municipalities.

1. DEMOGRAPHIC CHANGES BETWEEN TWO CENSUSES IN THE VARDAR REGION

According to the latest statistical data, the Vardar region has the smallest number of inhabitants, i.e. 7.5% of the total population in the country (estimated population on June 30, 2022). Spatially, the region covers an area of 4,042 km² or 16.2% of the Macedonian territory and is also the least populated region with only 38.07 inhabitants per km² in 2002, compared to 34.1 inhabitants per km² in 2021.² The region consists of 9 municipalities: Veles, Gradsko, Demir Kapija, Kavadarsti, Lozovo, Negotino, Rosoman, Sveti Nikole and Chaska, in which 215 settlements are located. Table 1 presents a comparative overview of the situation between two censuses (2002-2021), regarding the changes in the total population in the Vardar region and its municipalities.

Table 1. Changes in the total resident population in the Republic of North Macedonia, in the Vardar region (NUTS level 3) and by municipalities (NUTS level 4), 2002 and 2021

	Total population		Change (natural increase) in population		Percentage	
	2002	2021	2002-2021		2002	2021
			Total	%		
RN Macedonia	2022547	1836713	-185834	-9.2	100	100
Vardar Region	154535	138722	-15813	-10.2	7.64	7.55
Veles	55108	48463	-6645	-12.1	35.66	34.94
Gradsko	3760	3233	-527	-14.0	2.43	2.33
Demir Kapija	4545	3777	-768	-16.9	2.94	2.72
Kavadarsti	38741	35733	-3008	-7.8	25.07	25.76
Lozovo	2858	2264	-594	-20.8	1.85	1.63
Negotino	19212	18194	-1018	-5.3	12.43	13.12
Rosoman	4141	3796	-345	-8.3	2.68	2.74
Sveti Nikole	18497	15320	-3177	-17.2	11.97	11.04
Chaska	7673	7942	269	3.5	4.97	5.73

Source: Census of the population, households and dwellings in the Republic of Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed: 15.02.2023); Census of the population, households and dwellings in the Republic of Macedonia, 20021, https://www.stat.gov.mk/publikacii/2022/POPIS_DZS_web_MK.pdf (accessed: 15.02.2023)

The data shows that the total population in the region decreased by 10.2% (or by 15813 inhabitants), which is more than the national average (-9.2%). The largest municipality by population in the region in both censuses is Veles, which accounted for 35.7% of the population in 2002, and 35% in 2021. The second largest is the Kavadarsti municipality, in which 25% of the total region's population lived in 2002, while in 2021 the share is 25.1%. The smallest municipality by population is Chaska, which is the only one where the total population between two censuses increased, from 5% in 2002, to 5.7% in 2021. The total population in Vardar region municipalities corresponds to the size of

² Census of the population, households and apartments in the RN Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed on February 15, 2023).

their territory and the population density. In all municipalities, the reduction of the total population is also reflected in the reduction of the population density. Only in Chaska municipality there is a positive change in population density, i.e. grew from 9.4 to 9.7 inhabitants per km².³

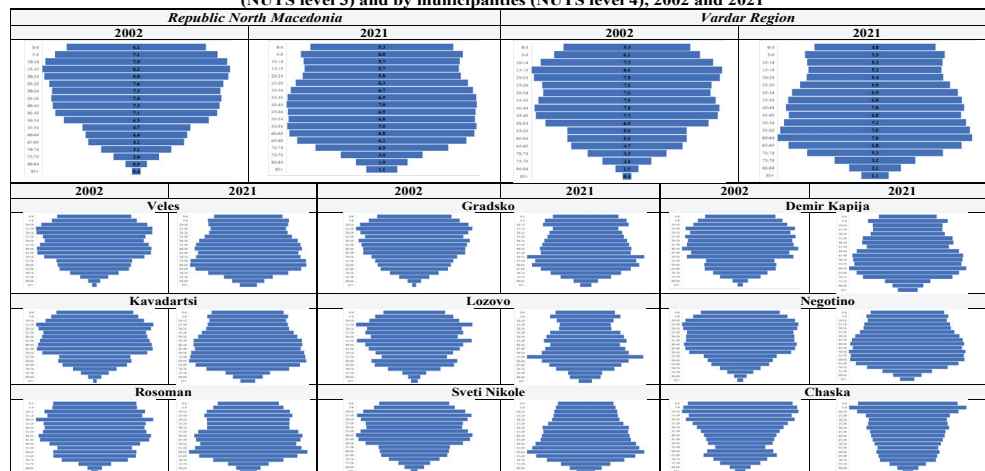
When analyzing the situation of the population according to five-year age groups, it should be pointed out that in the Census 2002 there was also a group of “unknown age”, which has a small absolute value and does not affect the percentage share distribution.

Tabela 3. Population according to five-year age groups, median age and population aging rank in the Republic of North Macedonia, in the Vardar region (NUTS level 3) and by municipalities (NUTS level 4), 2002 and 2021

	2002																				Unknown age	Median age	Rank
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+				
RN Macedonia	2022547	122757	143184	160339	165422	161945	153461	148281	149837	146902	142688	127760	95234	89822	84443	61969	40384	18975	7941	1203	35.0	5	
Vardar Region	154535	8244	9460	11206	12383	12107	11009	10885	11539	12020	11825	10624	7762	7759	7253	5144	3187	1520	573	35	36.3	5	
Veles	55108	2824	3230	4030	4426	4409	3903	3770	4136	4359	4314	3814	2877	2792	2646	1849	1077	463	183	6		5	
Gradsko	3760	197	241	288	308	286	261	295	280	271	270	227	207	194	178	130	80	36	11	0		5	
Demir Kapija	4545	223	269	298	347	318	351	331	339	369	312	338	217	229	226	173	129	49	17	10		5	
Kavadartsi	38741	2064	2344	2648	3147	3019	2758	2827	2946	3055	3112	2819	1913	1971	1736	1172	755	354	98	3		5	
Lozovo	2858	132	168	193	249	203	210	186	246	210	195	166	140	184	170	113	51	26	15	1		5	
Negotino	19212	1051	1255	1461	1548	1521	1416	1440	1440	1501	1464	1357	972	867	774	544	351	170	78	2		5	
Rosoman	4141	236	240	285	269	332	289	283	294	319	310	257	212	236	234	188	93	42	20	2		5	
Sveti Nikole	18497	912	1055	1331	1495	1392	1252	1402	1517	1454	1472	933	904	865	644	417	259	91	10	5		5	
Chaska	7673	605	658	672	594	627	549	501	456	419	394	374	291	382	424	311	234	121	60	1		5	
2021																							
RN Macedonia	1836713	96521	109318	105508	104035	106553	116145	123101	127381	128186	126444	125643	127752	124795	114187	89804	55256	35083	21001		40.8	6	
Vardar Region	138722	6620	7625	7390	7256	7454	8205	9037	9488	9713	9404	9935	10367	10612	9445	7412	4410	2847	1502		42.2	6	
Veles	48463	2213	2620	2577	2437	2535	2815	3178	3366	3460	3241	3371	3720	3751	3415	2586	1576	1047	555			7	
Gradsko	3233	155	193	202	155	171	180	195	205	216	212	276	238	253	212	166	119	58	27			6	
Demir Kapija	3777	151	208	182	181	193	234	238	214	266	289	285	279	305	267	233	119	81	52			7	
Kavadartsi	35733	1687	1889	1797	1873	1941	2145	2323	2531	2541	2473	2643	2690	2738	2440	1938	1038	699	347			6	
Lozovo	2264	115	136	110	99	101	136	150	160	135	155	169	225	168	140	113	66	60	26			6	
Negotino	18194	859	955	925	1000	1019	1101	1217	1290	1328	1273	1357	1318	1334	1198	942	578	332	168			6	
Rosoman	3796	162	186	220	233	219	218	218	265	286	276	254	281	313	260	186	108	65	46			6	
Sveti Nikole	15320	637	685	724	737	773	865	988	973	1007	1035	1153	1225	1344	1135	888	570	368	213			7	
Chaska	7942	641	753	653	541	502	511	530	484	474	450	427	391	406	378	360	236	137	68			5	

Source: Census of the population, households and dwellings in the Republic of Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed: 15.02.2023); Census of the population, households and dwellings in the Republic of Macedonia, 2021, https://www.stat.gov.mk/publikacii/2022/POPIS_DZS_web_MK.pdf; (accessed: 15.02.2023)

Graph 1. Percentage share according to five-year age groups in the Republic of North Macedonia, in the Vardar region (NUTS level 3) and by municipalities (NUTS level 4), 2002 and 2021



Source: Census of the population, households and dwellings in the Republic of Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed: 15.02.2023); Census of the population, households and dwellings in the Republic of Macedonia, 2021, https://www.stat.gov.mk/publikacii/2022/POPIS_DZS_web_MK.pdf; (accessed: 15.02.2023)

Presented numerical situation and percentage share of the population by age groups (Table 3) indicates that at national level, the median age increases from 35 to 40.8 years. Median age (together with share of the total population under 20, under 40 and over 60, as well as the aging index), causes a change in the population aging rank from 5 (demographic age) to 6 (deep demographic age). The Vardar region follows this trend, i.e. the median age of 36.3 years has grown to 42.2 years and the population aging rank moved from 5 to 6. At municipal level, Veles, Demir Kapija, Lozovo and Sveti Nikole moved to rank 7 (deepest demographic age), and only Chaska municipality has rank 5.

Although the absolute numbers show a stable, slight downward trend, when inter-census changes analyzed and compared in percentage share (structural change) at the municipal level (Graph 1), it is clear that in some of them the situation regarding population growth is more serious. Namely, in the municipalities of Veles, Demir Kapija, Kavadarci and Lozovo there is a more serious structural decrease in the age groups 10-14, 15-19 and 20-24 years. In the same time, there is a significant increase in the age groups 55-59, 60-64 years in the municipalities of Demir Kapija, Kavadarci, Lozovo, Negotino, Rosoman and Sveti Nikole, and significant increase in the age groups 65-69 and 70-74 years in the municipalities of Veles and Negotino. Hence, the aging of the population is more pronounced in the Vardar region than at the national level. The situation becomes even more serious if we add that in the inter-census period there is also a downward trend in the functional age-gender contingents.⁴ The decline of the share of women in the reproductive period, that is, the age groups of the female fertile population (15-49 years) and women in the optimal reproductive age (20-34 years), is of particular concern here. At the national level, in the period 2002-2021, the participation of female fertile population decreased from 25.5% to 22.4%, and at region's level from 25.3% to 21.0%. In the same time, both at national and at region's level, the drop in the contingent of women in optimal reproductive age is 11.2% to 9.2%, and 10.5% to 8.5%, respectively. The only exception is Chaska municipality, with slight increase in the female fertile population (15-49 years), 20.8% to 21.2%.⁵ Thus, the unfavorable age structure of the population not only worsens

4 Women in the reproductive period (15-49 years) influence the values of the total fertility rate (TFR) which is considered as hypothetical or possible fertility and represents the number of live births that a woman is expected to have during her reproductive period.

5 Census of the population, households and apartments in the Republic of Macedonia 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed on February 15, 2023); Census of the population, households and apartments in the Republic of North Macedonia 2021 https://www.stat.gov.mk/publikacii/2022/POPIS_DZS_web_MK.pdf (accessed on 15.02.2023)

the problem of population growth, but also worsens the reproduction of the population, that it reduces the reproductive base.

According to the educational attainment, the Vardar region follows national trends. In the inter-census period, the share of the population with uncompleted primary and lower secondary education decreases, while a positive trend is observed in other types of educational attainment. Considering that this analysis refers to the socio-economic situation and follows the changes of the population in terms of available human resources (working age population and labor force), in the following text only the demographic changes in the population with educational attainment from upper secondary education⁶ or higher, that can engage in economic activity will be commented. In addition, it should also be said that in the country the high education segment has undergone reforms, so according to Article 184 of the Law on Higher Education from 2000⁷, the high schools in the RN Macedonia went through a process of transformation and continued their activity as higher education schools.

According to both censuses, population with upper secondary education from Vardar region participate about 9% in the national structure (Table 4). However, at the region's level, a slight increase in the population with upper secondary education is observed from 42.2% in 2002 to 50.8% in 2021. In both censuses, the majority of this population are in the municipalities of Veles (38.7% and 36.3%, respectively), Kavadarci (28.5% and 27.9%, respectively) and Negotino (12.4% and 13.3%, respectively), while Lozovo municipality has the least (1.2% and 1.4%, respectively). In both censuses is noticed a seemingly large increase in the share of the population with higher education school, faculty and academia, both in national and region's level (from 6.5% to 17% and 5.2% to 15%, respectively), which is actually due to the transformation of high schools into higher education school and compulsory upper secondary education. Largest percentage of population with higher education school, faculty and academia in both censuses have the municipalities of Veles (42.7% and 37.9%), Kavadarci (30.8% and 31.8%) and Negotino (12% and 13.3%), respectively. Regarding this group of population, there have been changes in relation to the municipalities with the lowest share, that is, in 2002, the municipalities of Chaska and Rosoman had the smallest participation with 0.4% each, and in 2001, it was the Lozovo municipality with 0.8%.

6 According to Article 3 of the Law on Secondary Education, published in Gazette of the Republic of Macedonia no. 49/2007, starting from the academic year 2008-2009, upper secondary education in the Republic of Macedonia is mandatory.

7 Gazette of the Republic of Macedonia: Law on Higher Education, no. 64/2000, <https://www.slvesnik.com.mk/Issues/766C5EB039794C2186FCDC03417A69D1.pdf> (accessed on 24.1.2024)

Table 4. Total population at 15 years of age and over according to the educational attainment in the Republic of North Macedonia, in the Vardar region (NUTS level 3) and by municipalities (NUTS level 4), 2002 and 2021

			Without education						Uncompleted primary and lower secondary education						Primary and lower secondary education						Upper secondary education						High school						Higher Education School, Faculty, Academia						Masters of science						Holders of doctorate						In process of primary and lower secondary education/unknown					
	2002		2021		2002		2021		2002		2021		2002		2021		2002		2021		2002		2021		2002		2021		2002		2021		2002		2021		2002		2021																	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%																		
RV																																																								
Macedonia	1596267	1525366	67358	4.2	23192	1.5	219507	13.8	62129	4.1	559082	35.0	423456	27.8	588554	36.9	672375	44.1	50302	3.2	104081	6.5	263349	17.2	2783	0.2	29654	1.9	2069	0.1	6037	0.4	2531	0.2	45174	3.0																				
Vardar Region	125625	117087	5393	4.3	1638	1.4	21204	16.9	6891	5.9	35077	27.9	27000	23.1	52975	42.2	59534	50.8	4254	3.4	6493	5.2	17339	14.8	88	0.1	1194	1.0	15	0.0	84	0.1	126	0.1	3407	2.9																				
Veles	45024	41053	1461	3.2	366	0.9	6243	13.9	1607	3.9	12401	27.5	8700	21.2	20491	38.7	21606	36.3	1553	1.2	2770	42.7	6667	37.9	40	0.1	494	1.2	7	0.0	39	0.1	58	0.1	1674	4.1																				
Gradsko	3034	2683	234	7.7	56	2.1	738	24.3	352	13.1	1104	36.4	886	33.0	845	1.6	1152	1.9	59	0.0	46	0.7	174	1.0	-	-	10	0.4	-	-	1	0.0	8	0.3	52	1.9																				
Demir Kapija	3755	3236	496	13.2	251	7.8	788	21.0	239	7.4	1025	27.3	857	26.5	1282	2.4	1562	2.6	88	0.1	73	1.1	265	1.5	1	0.0	19	0.6	-	-	-	-	2	0.1	43	1.3																				
Kavadartsi	31685	30360	847	2.7	326	1.1	4394	13.9	1022	3.4	8046	25.4	5761	19.0	15076	28.5	16617	27.9	1277	1.0	1998	30.8	5511	31.8	21	0.1	330	1.1	5	0.0	18	0.1	21	0.1	775	2.6																				
Lozovo	2365	1903	239	10.1	57	3.0	520	22.0	178	9.4	855	36.2	689	36.2	657	1.2	810	1.4	46	0.0	42	0.6	132	0.8	1	0.0	6	0.3	-	-	-	-	5	0.2	31	1.6																				
Negotino	15445	15455	557	3.6	217	1.4	2536	16.4	942	6.1	4323	28.0	3543	22.9	6593	12.4	7924	13.3	635	0.5	779	12.0	2312	13.3	14	0.1	167	1.1	1	0.0	12	0.1	7	0.0	338	2.2																				
Rosoman	3380	3228	223	6.6	46	1.4	835	24.7	300	9.3	1123	33.2	967	30.0	1099	2.1	1630	2.7	71	0.1	27	0.4	228	1.3	-	-	12	0.4	-	-	2	0.1	2	0.1	43	1.3																				
Sveti Nikole	15199	13274	825	5.4	124	0.9	2567	16.9	748	5.6	4470	29.4	3340	25.2	6097	11.5	6648	11.2	480	0.4	734	11.3	1949	11.2	11	0.1	143	1.1	2	0.0	12	0.1	13	0.1	310	2.3																				
Chaska	5738	5895	511	8.9	195	3.3	2583	45.0	1503	25.5	1730	30.1	2257	38.3	835	1.6	1585	2.7	45	0.0	24	0.4	201	1.2	-	-	13	0.2	-	-	-	-	10	0.2	141	2.4																				

Source: Census of the population, households and dwellings in the Republic of Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed: 15.02.2023); Census of the population, households and dwellings in the Republic of Macedonia, 20021, https://www.stat.gov.mk/publikacii/2021/POPIS_DZS_web_MK.pdf; (accessed: 15.02.2023)

2021

	Total		Working age population (persons)		Active population		Inactive population		Unknown-2021		General activity rate (active in total)		General activity rate of the working age contingent (active in working age)		Rate of economic underutilization of the working age contingent	
	2002	2021	2002	2021	2002	2021	2002	2021	Total	% in working	2002	2021	2002	2021	2002	2021
RV Macedonia	2022547	1836713	1577001	1210035	743676	712328	833325	462182	35525	2,9	36,8	38,8	47,2	58,9	52,8	38,2
Vardar Region	154535	138722	125067	91471	65250	58410	59817	30483	2578	2,8	42,2	42,1	52,2	63,9	47,8	33,3
Veles	55108	48463	44820	31874	24248	20131	20572	10346	1397	4,4	44,0	41,5	54,1	63,2	45,9	32,5
Gradsko	3760	3233	3024	2101	1418	1353	1606	713	35	1,7	37,7	41,8	46,9	64,4	53,1	33,9
Demir Kapija	4545	3777	3754	2484	1849	1585	1905	874	25	1,0	40,7	42,0	49,3	63,8	50,7	35,2
Kavadartsi	38741	35733	31624	23898	16710	16596	14914	6758	544	2,3	43,1	46,4	52,8	69,4	47,2	28,3
Lozovo	2858	2264	2363	1498	942	842	1421	637	19	1,3	33,0	37,2	39,9	56,2	60,1	42,5
Negotino	19212	18194	15430	12237	8746	8473	6684	3534	230	1,9	45,5	46,6	56,7	69,2	43,3	28,9
Rosoman	4141	3796	3378	2563	1612	1527	1766	1011	25	1,0	38,9	40,2	47,7	59,6	52,3	39,4
Sveti Nikole	18497	15320	15121	10100	7868	6336	7253	3545	219	2,2	42,5	41,4	52,0	62,7	48,0	35,1
Chaska	7673	7942	5553	4716	1857	1567	3696	3065	84	1,8	24,2	19,7	33,4	33,2	66,6	65,0

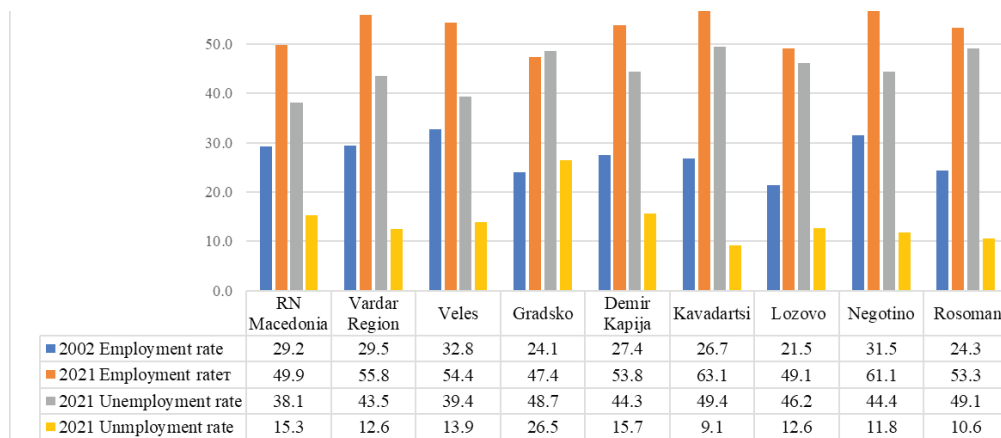
Source: Census of the population, households and dwellings in the Republic of Macedonia, 2002 (Book XIII), <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>; (accessed: 15.02.2023); Census of the population, households and dwellings in the Republic of Macedonia, 20021, https://www.stat.gov.mk/publikacii/2021/POPIS_DZS_web_MK.pdf; (accessed: 15.02.2023)

Before going into the population's economic characteristics, it is important to note that the data from the 2002 and 2021 censuses cannot be directly compared. Namely, in the 2002 census, data on the economic characteristics of the population were based on the Labour Force Survey, whereas in 2021, they were acquired from administrative data sources (registers) in the country. It indicates a methodological mismatch in these data, making direct comparison impossible. Furthermore, according to Eurostat's recommendations and the existing Macedonian legal framework, which provides retirement at the age of 64 (with the exception of certain categories of employees), it is more relevant in the analysis to use the working-age population aged 15 to 64 years. However, only data on the working-age population aged 15 and up were published in the State Statistics Office's database for the Census 2002 year.

Working age population (active and inactive), the situation is best understood through the activity rates (general activity rate, general activity rate of the working age contingent and rate of economic underutilization of the working age contingent) which at the national level have a favorable trend. Generally, the Vardar region follows the national trend, with a more favorable structure. Having in mind methodological discrepancies, in Table 5 are given data regarding all activity rates in the two consequent Censuses. By municipalities, the general activity rates gravitate around the value at the region's level in both censuses, with a larger deviation in Chaska municipality (24.2% and 19.7%, respectively), while in the municipality of Lozovo there is a deviation only in the census of 2002 (33%). As expected, the values other two rates correspond with the values of the general activity rates.

Regarding the employment and unemployment rates, the trends are favorable both at national and at region's level, that is, the employment rate is increasing, and the unemployment rate is decreasing (Graph 2). More specifically, the employment rate in 2002 at the region's level was the same as the national rate (29.2% and 29.5%), but in 2021, its increase is higher (29.5% to 55.8%, respectively), in relation to the increase of the national rate (29.2% to 49.9%, respectively). At region's level in 2002, the unemployment rate (43.5%) was significantly higher than the national rate (38.1%), but in 2021 it drastically decreased and amounted to 12.6%, that in the same time is less than the national rate of 15, 3%.

Graph 2. Employment and unemployment rates in in the Republic of North Macedonia, in the Vardar region (NUTS level 3) and by municipalities (NUTS level 4), 2002 and 2021



On municipal level, in 2002 the employment rate was the highest in Veles (32.8%) and Sveti Nikole (30.9%), being also higher than both the national and region’s rates. Chaska municipality has the lowest employment rate (19.4% and 24.9%, respectively). Regarding the unemployment rate, it decreased in all municipalities in 2021, especially in Kavardartsi, Rosoman and Lozovo. In 2021, Kavardaci municipality has the lowest unemployment rate of 9.1%, while Gradsko has the highest, 26.5%.

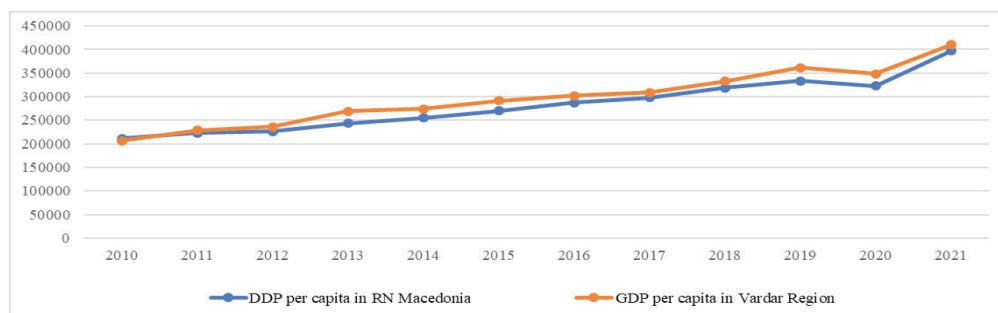
2. ECONOMIC ACTIVITY OF THE VARDAR REGION

The economic activity of the Vardar region will be analyzed for the period 2010-2021 through several indicators: Gross domestic product per capita, GDP index, Gross value added by activity sectors, Gross fixed capital formation by activity sectors and number of active enterprises. Starting from 2009, these data are regularly published in the “Regions in the Republic of North Macedonia”. They show the eight non-administrative regions in the country, divided according to the NUTS Nomenclature, harmonized with the European regulation.

In the creation of the gross domestic product at the national level, the Vardar region has a relatively low and fluctuating participation, but with a slight upward trend. When GDP is correlated with total population, keeping in mind that it is slightly and continuously growing at the national level for the majority of the analysed period, while it is slightly and continuously decreasing in the

Vardar region, it is determined that GDP per capita is more favourable in the region. In the same period, GDP per capita in the Vardar region increases slightly and since 2011 it exceeds the value of GDP per capita at the national level (Graph 3).

Graph 3. GDP per capita in the Republic of North Macedonia and in the Vardar Region, for the period 2010-2021



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
DDP per capita in RN Macedonia	211246	223357	226440	243161	255206	269996	286995	297954	318309	333551	322929	397147
GDP per capita in Vardar Region	206667	228324	236025	268819	274404	291516	302286	308493	332992	361636	348241	410511
GDP index par capita in Vardar region	97.8	102.2	104.2	110.6	107.5	108.0	105.3	103.5	104.6	108.4	107.8	103.4

Source: State Statistical Office, “Regions of the Republic of North Macedonia” 2009-2023, <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed: 20.02.2024))

GDP index is also more favorable in the region. It exceeds the value of the national index, especially in 2019 when it is 108.4.

Regarding contribution to the gross added value at the national level, the Vardar region is in 5th or 6th place. In term of gross value added by sectors of activity, the region records a fluctuating participation on national level, and it had the largest share of 8.2% in 2013 for the period 2010-2021. (Table 8)

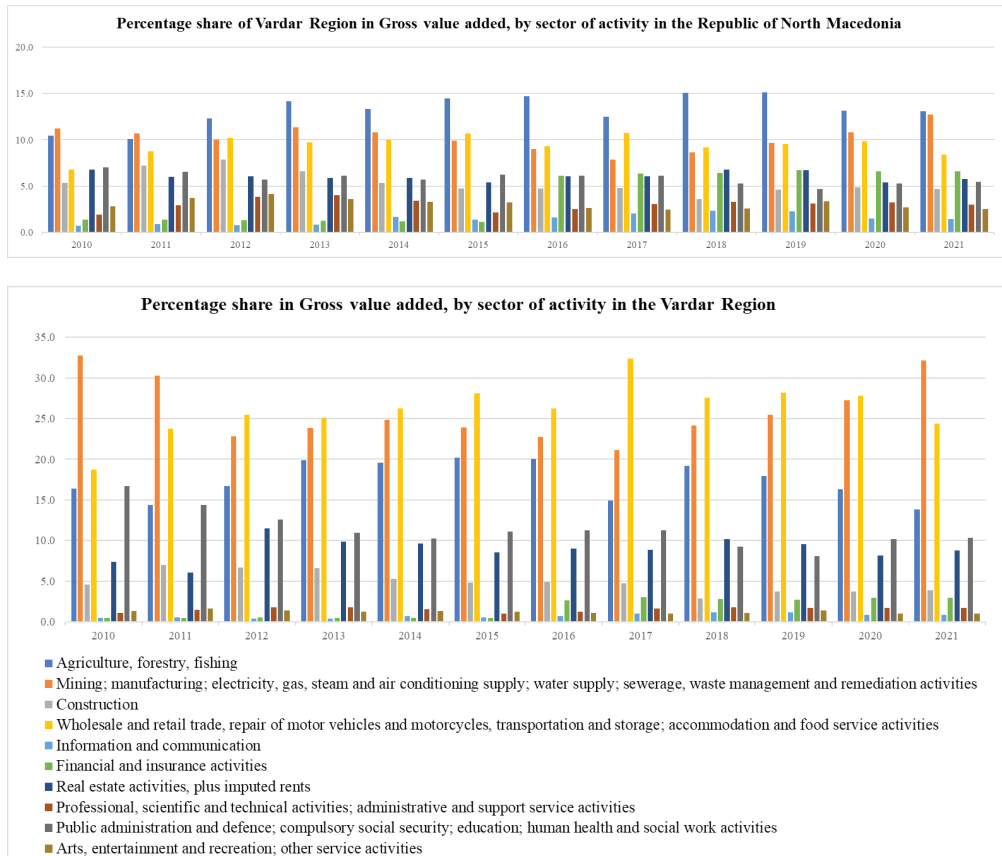
Table 8. Percentage share of Vardar Region in Gross value added, by sector of activity in the Republic of North Macedonia, for the period 2010-2021

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Gross value added	7.3	7.6	7.8	8.2	8.0	8.0	7.8	7.6	7.7	7.9	7.9	7.8
Agriculture, forestry, fishing	10.5	10.1	12.3	14.2	13.3	14.5	14.7	12.5	15.1	15.2	13.1	13.1
Mining; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities	11.2	10.7	10.0	11.3	10.8	9.9	9.0	7.8	8.6	9.7	10.8	12.7
Construction	5.4	7.2	7.9	6.6	5.3	4.7	4.7	4.8	3.6	4.6	4.8	4.7
Wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage; accommodation and food service activities	6.8	8.8	10.2	9.8	10.0	10.7	9.3	10.7	9.2	9.6	9.8	8.4
Information and communication	0.7	0.9	0.8	0.8	1.7	1.4	1.6	2.0	2.4	2.3	1.5	1.4
Financial and insurance activities	1.4	1.4	1.3	1.2	1.2	1.1	6.1	6.4	6.4	6.7	6.6	6.6
Real estate activities, plus imputed rents	6.8	6.0	6.0	5.9	5.9	5.4	6.1	6.1	6.7	6.7	5.4	5.8
Professional, scientific and technical activities; administrative and support service activities	1.9	3.0	3.8	4.0	3.4	2.2	2.5	3.1	3.3	3.1	3.2	3.0
Public administration and defence; compulsory social security; education; human health and social work activities	7.0	6.5	5.7	6.1	5.7	6.3	6.1	6.1	5.3	4.7	5.3	5.4
Arts, entertainment and recreation; other service activities	2.8	3.7	4.1	3.6	3.3	3.2	2.6	2.5	2.6	3.3	2.7	2.5

Source: State Statistical Office, "Regions of the Republic of North Macedonia" 2009-2023,
<https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed: 20.02.2024)

In terms of this indicator, from the region's leading sectors are: agriculture, forestry, fishing; mining, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities and wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities. With the exception of 2010 and 2011, the sectors of agriculture, forestry and fishing have the highest participation in the national gross value added (lowest in 2012, 2.3% and highest in 2019, 15.2%). Other two sectors alternately appear in second and third place, with a fluctuating degree of participation in the national gross added value. The sectors of mining, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities have the largest share of 21.7% in 2021 (second), and the lowest of 8.7% in 2017 (third). The sectors of wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities have the largest share of 10.7% in 2017 (second), and the smallest at 6.8% in 2010 (third). Additionally, the sectors of financial and insurance activities, have modest share until 2015 (1.2%), but since 2016 have significant and stable increase (highest share of 6.7% in 2019).

Graph 4. Percentage share in Gross value added, by sector of activity in the Republic of North Macedonia and in the Vardar Region, for the period 2010-2021

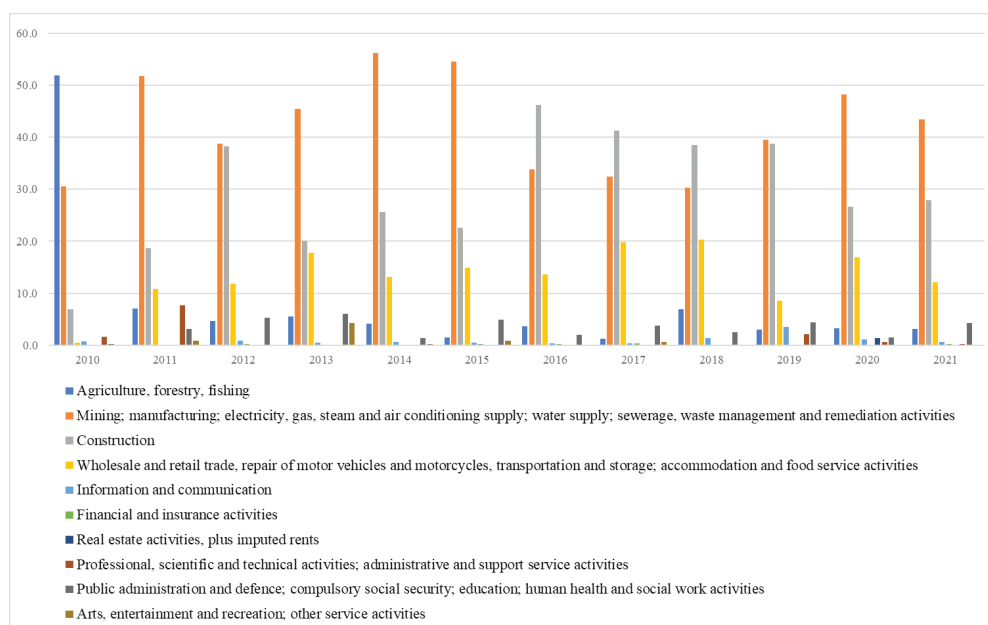


Source: State Statistical Office, "Regions of the Republic of North Macedonia" 2009-2023, <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed: 20.02.2024)

When observing the participation in the gross added value according to the sectors of activity within the region itself, the situation is different (Graph 4). Only in 2010, 2011 and 2021, the sectors of mining, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities were leading. In all other years, the sectors of wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities have the largest share. For the entire period, the sectors of agriculture, forestry and fishing are third.

In terms gross fixed capital formation by sectors of activity at the national level in the period 2010-2021, the participation of the Vardar region is modest and fluctuating. It had its minimum in 2012 (4.6%), and its maximum in 2016 (7.3%).⁸ Within the region, the sectors of mining, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities and agriculture, forestry and fishing have a leading and stable participation.

Graph 5. Percentage share in Gross fixed capital formation, by sector of activity in the Vardar region, for the period 2010-2021

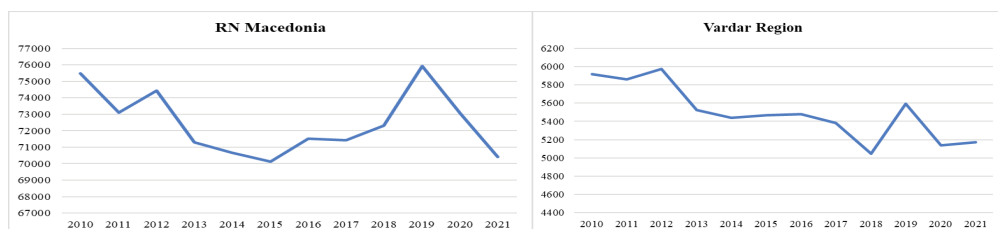


Source: State Statistical Office, “Regions of the Republic of North Macedonia” 2009-2023, <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed: 20.02.2024)

The share of gross fixed capital formation by sectors of activity at the region’s level for the period 2010-2021 is different (Graph 5). Three leading sectors are: mining, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities; construction and wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities. Gross fixed capital formation in the sectors of agriculture, forestry and fishing are insignificant, with the exception of 2010.

⁸ State Statistics Office, Regions in the Republic of North Macedonia, publications 2009-2021, <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed on: 20.02.2024)

Graph 6. Total number of active enterprises in the Republic of North Macedonia and in the Vardar Region, for the period 2010-2021



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
RN Macedonia	75497	73118	74424	71290	70659	70139	71519	71419	72315	75914	73061	70424
Vardar Region	5915	5858	5975	5526	5440	5470	5481	5383	5049	5595	5138	5170

Source: State Statistical Office, "Regions of the Republic of North Macedonia" 2009-2023, <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37> (accessed: 20.02.2024)

Total number of active enterprises for the period 2010-2021 records a negative trend both at national and region's level (smaller fluctuations). There was an insignificant increase in the number of active enterprises in 2012, while in 2019 that increase is more pronounced, both at the national and region's level (Graph 6). The lowest number of active enterprises in RN Macedonia was in 2015, while in the Vardar region in 2018.

3. CONCLUSIONS AND RECOMMENDATIONS

The numerical state of the resident population and its structure are one of the most important aspects of the population that affect its development, but also the possibilities for the overall socio-economic development.

The analysis of inter-census demographic changes showed that they are less favorable in the Vardar region, compared to the general situation at the national level.

The unfavorable demographic situation in the Vardar region leads to the reduction of the total population and increased participation of the aging contingent. This also leads to a decrease in the labor force, that has better activity and educational attainment in the region than the one at the state level. The accelerated aging of the population and the reduction of the contingent of the reproductive female population reduce the reproductive base of the region, which means that in the medium term the region will face an even more pronounced labor shortage.

Data on the rate of active population, employment and unemployment in the Vardar region are more favorable than the national level, but the region fails to achieve significant economic development and follow the trends in more developed regions. This is primarily due to the fact that newly added value and gross fixed capital formation are created and placed in labor-intensive sectors. In addition, the continuous decrease in the number of active enterprises in the region has an unfavorable effect on economic development.

At the same time, the analysis of educational attainment showed that the level of education of the workforce in the Vardar region is growing, which points to the conclusion that the region should expect an increased lack of workforce with low and medium qualifications, necessary to maintain labor-intensive activities. In order to alleviate the shortage of labor force caused by the unfavorable demographic trends in the Vardar region, there is a need to properly redefine the priorities and the relevant policies of action.

In the short term, the shortage of available labor could be alleviated through labor imports. Although there is a legal framework for this, initial experiences show that it needs simplification of the administrative procedures and the issuing of permits.

In the medium term, it is necessary to increase and improve the structure of gross fixed capital formation both in the leading and in the other sectors of activities in the region. Namely, part of the labor shortage in the leading labor-intensive sectors could be mitigated by investments in mechanization, automation and digitization of production processes. However, in order to engage and retain the young highly qualified workforce in the region, it will be necessary to intensify investments and encourage the development of other sectors of activities that could offer suitable jobs for them.

References:

- Agata Szymańska: "Demographic Changes in the Countries of the Western Balkans-A Comparative Analysis with the European Union", *nomic Research. Central and Eastern Europe* Volume 25, Number 3, 2022, available at: <https://doi.org/10.18778/1508-2008.25.26>
- Cane Koteski, Dusko Josheski, Zlatko jakovlev, Nikola V. Dimitrov and Snezana Bardarova, "Macedonia Demographic Aging", *Journal of Earth Science and Engineering* 4, 2014, pp. 445-454, available at: <https://eprints.ugd.edu.mk/10970/1/7-Macedonia%20Demographic%20Aging2.pdf>
- Lutz, W., Butz, W.P. and Samir, K.C.: "World Population and Human Capital in the TwentyFirst Century", Oxford, UK: Oxford University Press, 2014, available at: https://api.pageplace.de/preview/DT0400.9780191008221_A24387738/preview-9780191008221_A24387738.pdf https://api.pageplace.de/preview/DT0400.9780191008221_A24387738/preview-9780191008221_A24387738.pdf
- Publication Office of the European Union: "Demographic developments in the Western Balkans and Turkey", 2021, available at: <https://ec.europa.eu/eurostat/documents/4031688/12964134/KS-02-21-839-EN-N.pdf/c28bc490-eba4-8f8f-c368-40ad7b68c968?t=1624974063259>
- Republic of North Macedonia State Statistical Office, "Regions of the Republic of North Macedonia, 2012-2023" available at: <https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=32&rbrObl=37>
- Republic of North Macedonia State Statistical Office, "Census of the population, households and dwellings in the Republic of Macedonia, 2002" (Book XIII), available at: <https://www.stat.gov.mk/Publikacii/knigaXIII.pdf>
- Republic of North Macedonia State Statistical Office, "Census of the population, households and dwellings in the Republic of Macedonia, 2021", available at: https://www.stat.gov.mk/publikacii/2022/POPIS_DZS_web_MK.pdf