The Impact of Pandemics on Workforce Joblessness in Central Europe in pre-Covid Era and during Pandemic

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A B S T R A C T

Unemployment affects individuals socially, personally, and economically. The impact of being jobless can be long-lasting. Five different generations participate in the workplace today. As countries throughout the world went into lockdown to combat the spread of Covid-19, unemployment numbers rose rapidly. This study aimed to examine the effects of unemployment in three-generation groups in V4 and Austria in the pre-Covid-19 era and during Covid-19. Descriptive statistics were used to present the collected data. OECD data were used for the analysis. Based on the data collected, unemployment decreases with age. The group aged 15-24 shows significantly higher unemployment than the other two groups. A gender difference in unemployment was confirmed only in the Czech Republic and Slovakia. Unemployment has increased during the Covid-19 pandemic. The unemployment gap for females before and during Covid-19 was not confirmed. The T-Test confirmed the difference in unemployment before and during the crisis in the age categories 15-24 and 25-54. In Hungary, Poland, and Slovakia, the number of people with a duration of employment of up to one year differs in all age categories. In the Czech Republic, there is a significant difference only between the youngest group and the other two. In all countries, the largest number of people with the employment of up to one year is in the age group 25-54. In none of the examined countries was a gender unemployment gap proved before Covid-19.

Keywords: *unemployment, job tenure, V4 and Austria*

Introduction

Before Covid-19, it was predicted that for Europe as a whole, unemployment rates will return to their 2008 levels by 2030 (Cedefop, 2016). But unemployment rates globally vary dramatically in this time of Covid-19, even among the world's largest economies. Like the Great Recession and the recessions of the 1980s, the 90s, the early 2000s, and the 2010s, the Covid-19 recession caused sustained but unequal high unemployment. In the many countries severely affected by the economic crisis, the long-term unemployment (LTU) rate constitutes a general risk for the working population (Duell et al., 2016). The EU economy will experience a deep recession due to the coronavirus pandemic (EC, 2020).

In the pre-Covid-19 era, the Czech Republic retained the lowest unemployment rate (CSO, 2019), but due to the spread of the pandemic, its unemployment rate has risen (CSO, 2021). Overall, EU employment in the euro area rose to 8.3% and in EU-27 to 7.5 % in November 2020 (Eurostat, 2020). Since the early 1980s, unemployment has been a serious problem in Europe, especially among the youth, affecting the southern European countries the most (Hernanz and Jimeno, 2017).

Unemployment is not only a European but an intercontinental issue. Some of the sectors have gone into overdrive, e.g. health, manufacturing of food, beverages, transportation, while other large sectors, ranging from services to hospitality and tourism, have been deliberately shut down, resulting in high unemployment.

This study aimed to examine the effects of unemployment in three-generation groups in V4 and Austria in the pre-Covid-19 era and during Covid-19. The research question of this study was: Which age group in the surveyed countries is most affected by Covid-19 job losses?

In this paper, we briefly review the evidence and offer some general perspectives on its interpretation. The next paragraph describes the existing theoretical debate on the causes of unemployment. The second paragraph describes the methodology used in this paper. The subsequent part provides the results. The fourth section contains the discussion, and the last part offers a brief conclusion.

Causes of unemployment

LTU is felt to have disastrous effects on the individuals who suffer it, both in terms of their labor market opportunities and their more general physical and mental well-being (Machin

and Manning, 1998). The most significant cause of youth employment is poor macroeconomic performance. This results from a combination of slower rates of economic growth, demographic trends, and structural factors (OECD, 1978). Further, lack of growth affects each person in the economy, and especially some age groups are severely affected (e.g. youth unemployment has greater cyclical amplitude than adult unemployment (OECD, 1982)). According to Ryan (2001), youth are more severely affected than adults.

Recessions naturally drive up unemployment across the population (Knotek and Terry, 2009; Tasci and Zaman, 2010). The effects are more serious for those who have left their educational system and started their professional life (so-called frictional unemployment). For instance, the unemployment rate rose sharply in the European Union after March 2008 due to the global economic crisis (Eurostat, 2014).

Unemployment may also be influenced by where people live, e.g. in Australia. McDonald (1995) highlighted the higher rates of unemployment experienced by those living in older industrial areas. Also, Gregory and Hunter (1995) found that there had been little or no employment growth for people living in low socio-economic areas between 1976 and 1991, in contrast with the better conditions experienced by people living in higher socio-economic areas (McClelland and Macdonald, 1998). Those living in countries where there are social security policies and small business development occurs suffer less from the adverse effects of unemployment (Farber and Valletta, 2015) than those in underdeveloped countries, which tend to suffer more from the negative effects of unemployment (Duygan-Bump et al., 2015; Startiene and Remeikiene, 2015).

Children from less-privileged backgrounds experience more adult unemployment but are less affected by it in terms of well-being (Clark and Lepinteur, 2019). These authors further add that both educational achievement and good behavior at age 16 reduce adult unemployment.

Ahmad and Khan (2016) conclude that joblessness is a mixture of economic, community, and other specific elements. Based on Spermann (2016), the risk factors for LTU include old age and lack of vocational training. Black et al. (2015) stress that unemployment insurance policies benefit unemployed workers by giving them the resources to become qualified and reintegrate into the labor market.

Rodenburg (2004) stresses that the exact underlying cause or causes of unemployment can seldom be identified separately, and explanations are often surrounded by a set of auxiliary assumptions. The author further adds that technical progress and the immobility of labor or union power are hard to measure. Corry (1995) further notes that economists are not in control of policy and hence cannot be pilloried for the failure of the economic system to create jobs for all.

The gender unemployment gap was positive until the early 1980s. The gap disappeared after 1983, except during recessions when men's unemployment rates always exceeded those for women (Albanesi and Sahin, 2017).

Say's the law, namely that supply creates its demand, failed in 1930 due to the Great Depression, and has failed all over again today, this time due to Covid-19, once more proving a triumph for the Keynesian economist, the great prophet of the principle that demand creates its supply (Sirah and Atilaw, 2020). According to Rodríguez-Caballero and Vera-Valdés's data (2020) on unemployment, the periods associated with the Great Pandemic of 1870–1875 and the Russian flu show a more persistently higher level of unemployment. Additionally, after the Spanish flu pandemic and the First World War, the level and persistence of unemployment increased.

Research Method

The main purpose of this study was to examine the development of unemployment in three generations in selected countries during the pre-Covid era and Covid-19. We looked for answers for this basic research question: Which age group in the surveyed countries is most hit by Covid-19 job losses? Relationships based on OECD data for V4 and Austria were investigated. We have divided the unemployment data into three age groups: 1) 15-24, 2) 25-54 and 3) 55-64.

Firstly, a comprehensive review of the available literature for the given research question was done to explain the main causes of unemployment around the world. We briefly explain the nature and causes of unemployment. Secondly, Excel calculations and descriptive statistics (test of normality (Shapiro-Wilk test, Mann-Whitney U test), the test of homogeneity (Levene test), robust tests of equality of means (Welch Test), multiple comparisons, cross-tabulation, pairwise comparisons) were used to analyze the surveyed quantitative data. As Freeman and Julious (2006) emphasize, it is good practice to produce a table or tables that describe the initial or baseline characteristics of the sample. In this study, three basic tables have been prepared: 1) Unemployment rates from Q3-2018 to Q3-2020, 2) Unemployment rates from 2000 to 2019, and 3) Job tenure of less than one year from 2000 to 2019 (OECD, 2021). Descriptive analysis is data simplification. Good description presents what we know about capacities, needs, methods, practices, policies, populations, and settings in a manner that is relevant to a specific research or policy question (Loeb et al., 2017).

The following methodological background was used in this study: induction, descriptive statistics, synthesis, deduction in development of results, and concluding. Results are interpreted in graphic and narrative form and differences are discussed.

Results

The current pandemic recession, like those in the past, has already driven up the number of people who are not employed. It cut the number of available vacancies or offered a short-time work model. Generally, the lowest paid, the lowest skilled and the least experienced workers are those who are most severely affected.

Influence of age on unemployment (Q3 2018-Q3 2020)

The economic effect of the coronavirus has taken the surveyed countries into unknown territory. Based on Axelrad et al.'s (2018) empirical data, older workers' difficulties are related to their age, while for younger individuals the difficulties are

more related to the business cycle. Aging is the most important demographic change for employment (Zipperer, 2015).

Firstly, verification of normality using the Shapiro-Wilk test was done, as shown in Table 1.

Table 1. Tests of Normality[a,d,e,f,g]

Country	Age	Shapiro-Wilk Statistic	df	Sig.
Austria	15-24	0.864	8	0.131
	25-54	0.888	8	0.225
	55-64	0.955	9	0.744
Czech Republic	15-24	0.849	8	0.094
	25-54	0.804	8	0.031
	55-64	0.892	9	0.209
Hungary	15-24	0.849	8	0.093
	25-54	0.793	8	0.024
	55-64	0.979	9	0.957
Poland	15-24	0.948	8	0.686
	25-54	0.816	8	0.042
	55-64	0.949	9	0.680
Slovakia	15-24	0.923	8	0.456
	25-54	0.923	8	0.454
	55-64	0.946	9	0.645

Source: Author's own elaboration

All p-values (Sig.) are higher than the significance level of 0.01, therefore the data can be considered as normally distributed at the significance level of 1%. Further, to verify the difference in unemployment in the three age groups, an analysis of variance was used, see Table 2.

Table 2. Descriptives

Country	Age	N	Mean	St. Deviation	Min.	Max.
Austria	15-24	9	9.35539689	1.206309526	7.662745	11.846490
	25-54	9	4.44335411	0.576843030	3.776945	5.362896
	55-64	9	3.69590422	0.360740553	3.256543	4.366560
	Total	27	5.83155174	2.671031369	3.256543	11.846490
Czech Republic	15-24	8	6.06673412	0.607905814	5.523893	7.197931
	25-54	8	1.92807812	0.200134781	1.765623	2.366826
	55-64	9	1.93493711	0.169543376	1.758248	2.216835
	Total	25	3.25491728	2.001175084	1.758248	7.197931
Hungary	15-24	9	11.67672556	1.636391507	9.746470	15.219610
	25-54	9	3.34579100	0.488495832	2.888747	4.279451
	55-64	9	2.54022700	0.434559218	1.825979	3.216148
	Total	27	5.85424785	4.320919622	1.825979	15.219610
Poland	15-24	9	10.44439511	1.537346376	7.714942	12.250420
	25-54	9	2.93493222	0.297242132	2.660150	3.436341
	55-64	9	2.34681878	0.304406895	1.903968	2.770495
	Total	27	5.24204870	3.859461705	1.903968	12.250420
Slovakia	15-24	9	16.48292222	2.573672105	12.784160	20.415430
	25-54	9	5.63523800	0.448962482	5.167228	6.497922
	55-64	9	4.80161411	0.419738520	4.007823	5.356629
	Total	27	8.97325811	5.617529944	4.007823	20.415430

Source: Author's own elaboration

Verification of the assumption of homogeneity of variances using the Levene Test are shown in Table 3:

Table 3. Test of Homogeneity of Variances

Country		Levene Statistic	df1	df2	Sig.
Austria	Based on Mean	3.040	2	24	0.047
Czech Republic	Based on Mean	7.022	2	22	0.004
Hungary	Based on Mean	5.563	2	24	0.010
Poland	Based on Mean	9.874	2	24	0.001
Slovakia	Based on Mean	6.271	2	24	0.006

Source: Author's own elaboration

Based on the received data, the assumption of homogeneity of variances is not met in any surveyed country (Sig. <0.05). Thus, Welch's analysis of variance was applied, which takes into account the failure to meet this assumption (See Table 4).

Table 4. Robust Tests of Equality of Means

Country		Statistic[a]	df1	df2	Sig.
Austria	Welch	87.531	2	13.947	0.000
Czech Republic	Welch	168.717	2	12.759	0.000
Hungary	Welch	125.712	2	14.507	0.000
Poland	Welch	116.754	2	14.395	0.000
Slovakia	Welch	89.535	2	14.332	0.000

a. Asymptotically F distributed.
Source: Author's own elaboration

In all countries, the p-value of the test is lower than the significance level of 0.05, and there is at least one pair between age groups in all countries that differs significantly. Employing post-hoc tests of multiple comparisons, it has been found which groups differ, as displayed in Table 5.

Table 5. Multiple Comparisons (Dunnett T3)

Dependent Variable	(I) Age1	(J) Age1	Mean Difference (I-J)	Std. Error	Sig.
Austria	15-24	25-54	4.912042778*	0.445711735	0.000
		55-64	5.659492667*	0.419697830	0.000
	25-54	15-24	-4.912042778*	0.445711735	0.000
		55-64	0.747449889*	0.226784682	0.016
	55-64	15-24	-5.659492667*	0.419697830	0.000
		25-54	-0.747449889*	0.226784682	0.016

Country					
Czech Republic	15-24	25-54	4.138656000*	0.226275112	0.000
		55-64	4.131797014*	0.222233141	0.000
	25-54	15-24	-4.138656000*	0.226275112	0.000
		55-64	-0.006858986*	0.090557304	1.000
	55-64	15-24	-4.131797014*	0.222233141	0.000
		25-54	0.006858986*	0.090557304	1.000
Hungary	15-24	25-54	8.330934556*	0.569249539	0.000
		55-64	9.136498556*	0.564369745	0.000
	25-54	15-24	-8.330934556*	0.569249539	0.000
		55-64	0.805564000*	0.217937272	0.006
	55-64	15-24	-9.136498556*	0.564369745	0.000
		25-54	-0.805564000*	0.217937272	0.006
Poland	15-24	25-54	7.509462889*	0.521939414	0.000
		55-64	8.097576333*	0.522398043	0.000
	25-54	15-24	-7.509462889*	0.521939414	0.000
		55-64	0.588113444*	0.141820091	0.002
	55-64	15-24	-8.097576333*	0.522398043	0.000
		25-54	-0.588113444*	0.141820091	0.002
Slovakia	15-24	25-54	10.847684222*	0.870846039	0.000
		55-64	11.681308111*	0.869224976	0.000
	25-54	15-24	-10.847684222*	0.870846039	0.000
		55-64	0.833623889*	0.204870619	0.003
	55-64	15-24	-11.681308111*	0.869224976	0.000
		25-54	-0.833623889*	0.204870619	0.003

*. The mean difference is significant at the 0.05 level.
Source: Author's own elaboration

Table 5 shows that in Austria, Hungary, Poland, and Slovakia, all three age groups differ in terms of unemployment. It can be concluded that unemployment decreases with age. In the Czech Republic, there is no significant difference between the 25-54 and 55-64 age groups. People aged 15-24 show significantly higher unemployment than other age groups.

Gender influence on unemployment (Q3 2018-Q3 2020)

The unemployment gender gap (female and male unemployment rates) was positive until 1980. The gap virtually disappeared after 1980, except during recessions, when men's unemployment rates always exceed those of women (Albanesi and Sahin, 2017).

Firstly, a verification of normality was done using the Shapiro-Wilk test, as shown in Table 6.

Table 6. Tests of Normality[a,d,e,f,g]

Country	Gender	Shapiro-Wilk Statistic	df	Sig.
Austria	Females	0.859	27	0.002
	Males	0.804	27	0.000
Czech Republic	Females	0.775	27	0.000
	Males	0.757	27	0.000

Hungary	Females	0.802	27	0.000
	Males	0.714	27	0.000
Poland	Females	0.792	27	0.000
	Males	0.715	27	0.000
Slovakia	Females	0.728	27	0.000
	Males	0.774	27	0.000

Source: Author's own elaboration

Since the assumption of normality is not met, the non-parametric Mann-Whitney U Test was used to compare the figures for males and females, as shown in Table 7.

Table 7. Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution in Austria is the same across categories of Gender1.	Independent-Samples Mann-Whitney U Test	0.287	Retain the null hypothesis.
2	**The distribution in the Czech Republic is the same across categories of Gender1.**	**Independent-Samples Mann-Whitney U Test**	**0.010**	**Reject the null hypothesis.**
3	The distribution in Hungary is the same across categories of Gender1.	Independent-Samples Mann-Whitney U Test	0.710	Retain the null hypothesis
4	The distribution in Poland is the same across categories of Gender1.	Independent-Samples Mann-Whitney U Test	0.869	Retain the null hypothesis
5	**The distribution in Slovakia is the same across categories of Gender1.**	**Independent-Samples Mann-Whitney U Test**	**0.034**	**Reject the null hypothesis.**

Source: Author's own elaboration

Figures 1 and 2 show the significant gender unemployment rate in the Czech Republic and Slovakia.

Total N	54
Mann-Whitney U	215,000
Wilcoxon W	593,000
Test Statistic	215,000
Standard Error	57,804
Standardized Test Statistic	-2,586
Asymptotic Sig. (2-sided test)	,010
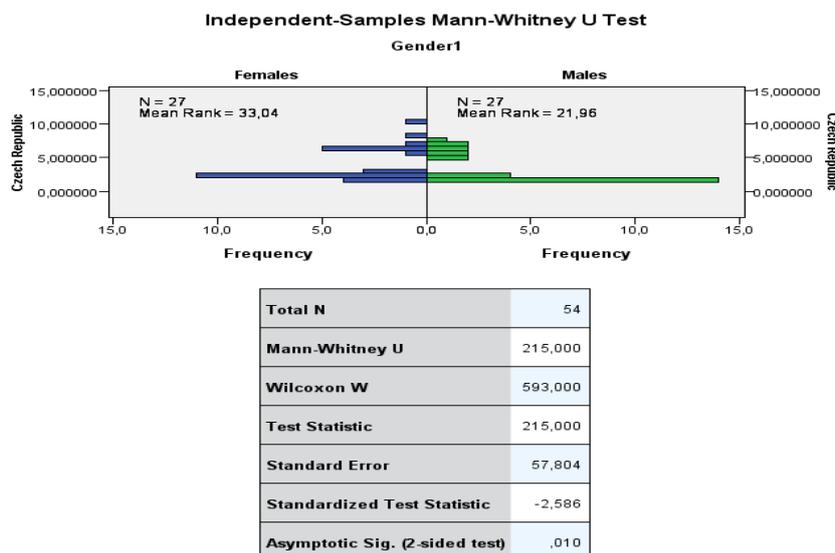
Figure 1. Independent-Samples Mann-Whitney U Test – Czech Republic
Source: Author's own elaboration

Total N	54
Mann-Whitney U	242,000
Wilcoxon W	620,000
Test Statistic	242,000
Standard Error	57,804
Standardized Test Statistic	-2,119
Asymptotic Sig. (2-sided test)	,034
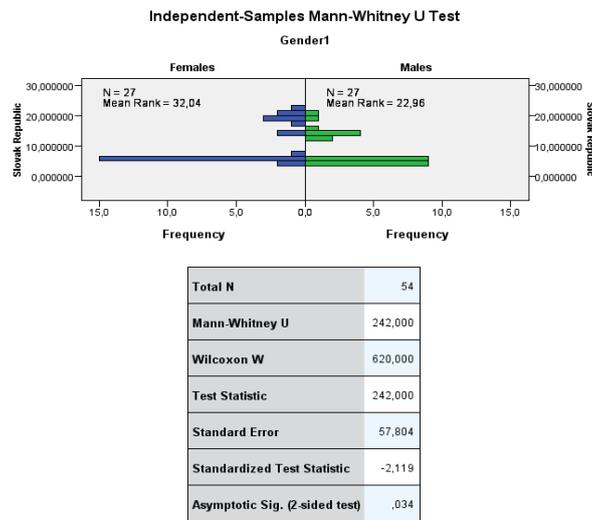
Figure 2. Independent-Samples Mann-Whitney U Test – Slovakia
Source: Author's own elaboration

Unemployment rates (Q3 2018 – Q3 2020) before and during Covid-19

Primarily, tests of normality were done in relation to country, gender and age variables, as shown in Table 8.

Table 8. Tests of Normality

		Shapiro-Wilk Statistic	df	Sig.
Before	Austria	0.797	6	0.055
	Czech Rep.	0.785	6	0.043
	Hungary	0.745	6	0.018
	Poland	0.755	6	0.022
	Slovakia	0.780	6	0.038
During	Austria	0.820	6	0.088
	Czech Rep.	0.781	6	0.039
	Hungary	0.767	6	0.029
	Poland	0.767	6	0.029
	Slovakia	0.754	6	0.022
Before	Female	0.817	15	0.006
	Male	0.855	15	0.020
During	Female	0.837	15	0.011
	Male	0.837	15	0.012
Before	15-24	0.944	10	0.600
	25-54	0.973	10	0.915
	55-64	0.901	10	0.225
During	15-24	0.922	10	0.374
	25-54	0.955	10	0.730
	55-64	0.931	10	0.461

Source: Author's own elaboration

Using a non-parametric test for pairwise comparisons (Wilcoxon Test), we verified the difference between female and male unemployment before and during Covid-19. Using the parametric test, we verified the difference in unemployment between the different age categories before and during Covid-19. Data were taken for all the surveyed states.

Male

The Wilcoxon paired test for males confirmed the difference in unemployment before and during pandemics, as displayed in Table 9.

Table 9. Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between before and during equals 0.	Related-Samples Wilcoxon Signed Rank Test	0.006	**Reject the null hypothesis.**
	Asymptotic significances are displayed	The significance level is 0.05.		

Source: Author's own elaboration

The distribution of unemployment before and during Covid-19 in the surveyed countries is shown in Figure 3a and b. On the basis of these data, unemployment has risen during Covid-19.

a) Before   b) During
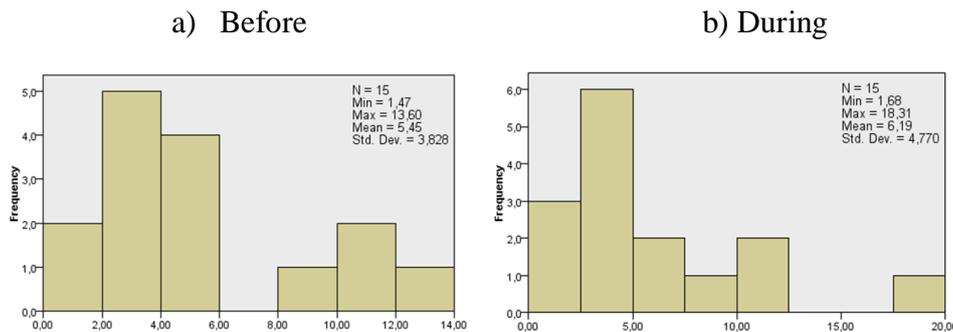
Figure 3. Continuous Field Information
Source: Author's own elaboration

Differences in unemployment between periods (during minus before) show the following results: unemployment increased in 11 values and decreased in four values (See Figure 4).
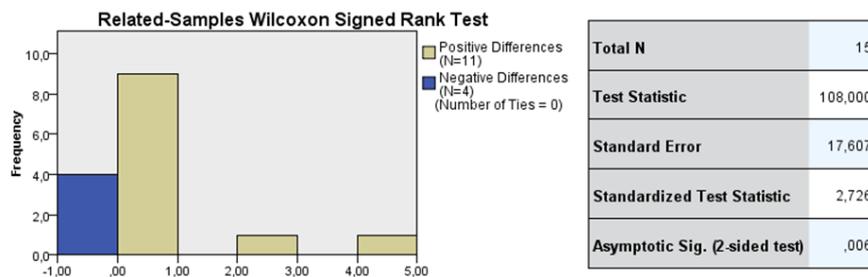
Figure 4. Related-Samples Wilcoxon Signed Rank Test
Source: Author's own elaboration

Female
The Wilcoxon paired test for females did not confirm the difference in unemployment before and during pandemics, as displayed in Table 10.

Table 10. Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between before and during equals 0.	Related-Samples Wilcoxon Signed Rank Test	0.061	Retain the null hypothesis.
	Asymptotic significances are displayed	The significance level is 0.05.		

Source: Author's own elaboration

The difference in female unemployment before and during Covid-19 was therefore not confirmed (Sig. > 0.05). The dramatic female share and the notable decline of the male share of unemployment have received considerable attention (Albanesi and Olivetti, 2016; Albanesi and Sahin, 2017; Greenwood et al. 2005; Olivetti 2006), and the data obtained in this study confirm this tendency.

Age

The T-Test confirmed the difference in unemployment before and during Covid-19 in categories of 15-24 and 25-54 years, as displayed in Table 11

Table 11. Paired Samples Test

Pair	Mean	St. Deviation	t	df	Sig. (2-tailed)
15-24	-1.83447	1.70141	-3.410	9	**0.008**
25-54	-0.44190	0.38849	-3.377	9	**0.008**
55-64	-0.01234	0.38206	-0.102	9	0.921

Source: Author's own elaboration

Comparison of job tenure of less than one year (2000-2019)

An analysis of the tenure distribution for the individual member states of the EU revealed strong cross-country differences in the pre-crisis period (Bachmann et al., 2015).

Firstly, a verification of normality using the Shapiro-Wilk Test was done, as shown in Table 12.

Table 12. Tests of Normality

Country	Age	Shapiro-Wilk Statistic	df	Sig.
Austria	15-24	0.698	17	0.000
	25-54	0.928	17	0.205
	55-64	0.943	13	0.496
Czech Republic	15-24	0.915	17	0.120
	25-54	0.881	17	0.033
	55-64	0.871	13	0.054
Hungary	15-24	0.943	17	0.355
	25-54	0.884	17	0.037
	55-64	0.838	13	0.020
Poland	15-24	0.883	17	0.035
	25-54	0.864	17	0.018
	55-64	0.928	13	0.323
Slovakia	15-24	0.939	17	0.310
	25-54	0.953	17	0.510
	55-64	0.874	13	0.059

Source: Author's own elaboration

In order to use the parametric test, all groups must meet the normal data distribution. Normality is met at the 1% level of significance in all countries except Austria (see Table 12). For this country, the non-parametric equivalent Kruskal-Wallis Test was used.

V4 countries

Further, to verify differences in job tenure in three individual age groups, analysis of variance was used, see Table 13.

Table 13. Descriptives

Country	Age	N	Mean	St. Deviation	Min.	Max.
Czech Republic	15-24	19	122.05	17.45	100.53	173.44
	25-54	19	348.60	25.56	323.63	422.43
	55-64	13	396.88	76.08	271.74	495.46
	Total	51	276.51	128.62	100.53	495.46
Hungary	15-24	20	111.17	17.01	81.89	147.17
	25-54	21	347.69	92.23	10.72	442.42
	55-64	19	32.36	16.89	11.20	57.05
	Total	60	169.00	146.88	10.72	442.42
Poland	15-24	20	520.30	80.47	424.37	688.29
	25-54	21	1218.87	298.29	56.33	1577.21
	55-64	19	91.31	31.92	38.15	128.47
	Total	60	628.95	503.50	38.15	1577.21
Slovakia	15-24	19	62.98	13.59	43.25	87.42
	25-54	19	169.18	31.29	112.69	217.86
	55-64	19	15.48	7.38	2.52	32.10
	Total	57	82.54	67.78	2.52	217.86

Source: Author's own elaboration

Again, Welch's analysis of variance was applied, which takes into account the failure to meet this assumption (see Table 14).

Table 14. Robust Tests of Equality of Means

Country		Statistic[a]	df1	df2	Sig.
Czech Republic	Welch	539.129	2	23.804	0.000
Hungary	Welch	193.434	2	34.955	0.000
Poland	Welch	368.420	2	29.937	0.000
Slovakia	Welch	273.454	2	30.050	0.000

a. Asymptotically F distributed.
Source: Author's own elaboration

In all countries, the p-value of the test is lower than the significance level of 0.05. There is at least one pair between the age groups in all countries that differs significantly. We can find out which groups differ by using post-hoc tests of multiple comparisons, as shown in Table 15.

Table 15. Multiple Comparisons (Dunnett T3)

Dependent Variable	(I) Age1	(J) Age1	Mean Difference (I-J)	Std. Error	Sig.
Czech Republic	15-24	25-54	-226.55118[*]	7.09960	0.000
		55-64	-274.82922[*]	21.47759	0.000
	25-54	15-24	226.55118[*]	7.09960	0.000

		55-64	-48.27804*	21.90099	0.124
	55-64	15-24	274.82922*	21.47759	0.000
		25-54	48.27804*	21.90099	0.124
	15-24	25-54	-236.51924*	20.48290	0.000
		55-64	78.80712*	5.42960	0.000
Hungary	25-54	15-24	236.51924*	20.78290	0.000
		55-64	315.32636*	20.49661	0.000
	55-64	15-24	-78.80712*	5.42960	0.000
		25-54	-315.32636*	20.49661	0.000
	15-24	25-54	-698.57044*	67.5344	0.000
		55-64	428.98491*	19.42637	0.000
Poland	25-54	15-24	698.57044*	67.53344	0.000
		55-64	1127.55535*	65.50312	0.000
	55-64	15-24	-428.98491*	19.42637	0.000
		25-54	-1127.55535*	65.50312	0.000
	15-24	25-54	-106.19996*	7.82599	0.000
		55-64	47.49715*	3.54727	0.000
Slovakia	25-54	15-24	-106.19996*	7.82599	0.000
		55-64	153.69711*	7.37574	0.000
	55-64	15-24	-47.49715*	3.54727	0.000
		25-54	-153.69711*	7.37574	0.000

*. The mean difference is significant at the 0.05 level.
Source: Author's own elaboration

In Hungary, Poland and Slovakia, all age categories differ in the number of people with a duration of employment of up to one year. In the Czech Republic, there is a significant difference only between the youngest group and the other two. In all countries, the largest number of people with the employment of up to one year is in the age group 25-54 years.

Austria

The difference between the number of people with employment of up to one year in the age groups is verified for Austria by a non-parametric analog of the analysis of variance, the Kruskal-Wallis Test. The results in Table 16 and Figure 5 show that at least one pair of age groups was confirmed (Sig.< 0.05).

Table 16. Hypothesis Test Summary

	Null Hypothesis	**Test**	**Sig.**	**Decision**
1	The distribution in Austria across categories of age.	Independent-Samples Kruskal-Wallis Test	0.000	**Reject the null hypothesis.**
	Asymptotic significances are displayed	The significance level is 0.05.		

Source: Author's own elaboration
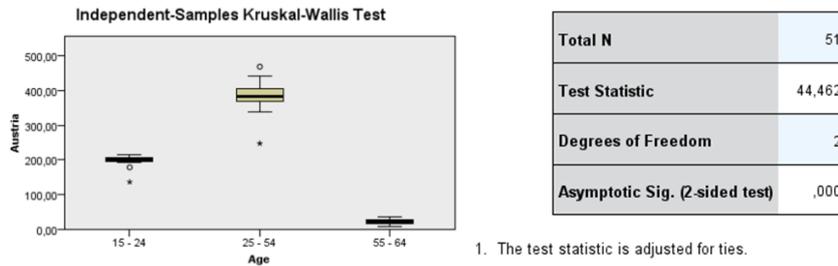
Figure 5. Independent-Samples Kruskal-Wallis Test
Source: Author's own elaboration

Further analysis through pairwise comparisons of age confirms a significant difference between all age groups. The group with the most people employed for up to one year is again the age group 25-54 years. The group with the fewest of them is the age group 55-64 years, as displayed in Figure 6.
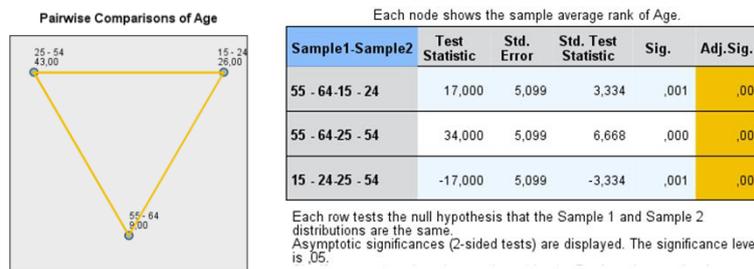
Figure 6. Pairwise Comparisons of Age
Source: Author's own elaboration

Comparison of unemployment rate by gender (2000-2019)

In this section, primarily, verification of normality using the Shapiro-Wilk Test was done, as shown in Table 17.

Table 17. Tests of Normality

Country	Gender	Shapiro-Wilk Statistic	df	Sig.
Austria	Female	0.827	20	0.002
	Male	0.934	20	0.185
Czech Republic	Female	0.822	20	0.002
	Male	0.915	20	0.079
Hungary	Female	0.907	20	0.056
	Male	0.911	20	0.057
Poland	Female	0.948	20	0.334
	Male	0.937	20	0.212
Slovakia	Female	0.911	20	0.067
	Male	0.935	20	0.193

Source: Author's own elaboration

The assumption is not met for Austria and the Czech Republic as Sig. < 0.05. For these countries, a parametric T-Test was used.

Hungary, Poland and Slovakia
Firstly, group statistics were compiled, as shown in Table 18.

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Table 18. Group Statistics

Country	Gender	N	Mean	St. Deviation
Hungary	Female	20	17.5319	6.02288
	Male	20	18.1846	6.29525
Poland	Female	20	28.1570	10.81600
	Male	20	25.5182	10.33556
Slovakia	Female	20	27.9685	5.92013
	Male	20	28.5743	8.62248

Source: Author's own elaboration

Verification of the assumption of homogeneity of variances using the Levene Test are shown in Table 19.

Table 19. Test of Homogeneity of Variances

Country		Levene Test		T-Test				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference
Hungary	Equal variances assumed	0.037	0.849	-0.335	38	0.739	-0.65271
Poland	Equal variances assumed	0.079	0.780	0.789	38	0.435	2.63886
Slovakia	Equal variances assumed	4.017	0.052	-0.259	38	0.797	-0.60584

Source: Author's own elaboration

The P-values are all higher than the chosen level of significance, therefore the difference in unemployment between males and females in the period 2000 to 2019 was not confirmed.

Austria and the Czech Republic

For Austria and the Czech Republic, a non-parametric test similar to the T-Test, the Mann-Whitney U test, was applied, see Table 20.

Table 20. Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Austria is the same across categories of gender.	Independent-Samples Mann-Whitney U Test	0.287[1]	Retain the null hypothesis.
2	The distribution of Czech Republic is the same across categories of gender.	Independent-Samples Mann-Whitney U Test	0.010[1]	Retain the null hypothesis.
	Asymptotic significances are displayed	The significance level is 0.05.		

[1]Exact significance is displayed for this test.

Source: **Author's own elaboration**

In none of the surveyed countries was a difference between female and male unemployment confirmed.

Discussion

Even before the pandemic, youth unemployment in the European Union was three times higher than among the over-55s (Grzegorczyk and Wolff, 2020). Data obtained in this study show the same threat because the younger generation is more severely affected than older generations. But, as stated by Cubanski et al. (2020), older adults are severely affected by Covid-19 and are also losing their jobs. As shown by the data from this study, the T-Test confirmed the difference in unemployment before and during the crisis in the age categories 15-24 and 25-54. Compared to previous recessions, the current recession has increased the number of people who are still able to work remotely (Eurofound, 2021).

But, while crises will naturally affect all workers differently, will this disproportion be experienced more severely by the most vulnerable: the youngest, the lowest paid, the lowest skilled, and the least experienced? Does Covid-19 put the future employment of millions of workers and the viability of thousands of businesses at risk? Based on recent data, women are facing a greater risk of unemployment and/or being placed on furlough or equivalent employment protection schemes (Wenham, 2020). In the surveyed countries, however, Covid-19 has a greater threat of unemployment for males. Significantly, a gender unemployment difference was observed in the Czech Republic and Slovakia.

The question remains: Will countries recover from this crisis after Covid-19 ends with a possible jobs boom? This crisis comes on top of pre-existing challenges. Since 2000, there has been a shift in the US job tenure distribution toward longer-duration jobs. A substantial number of these changes are caused by the aging of the workforce and the decline in the entry rate of new employer businesses (Hyatt and Spletzer, 2016). But, according to the data obtained, in Hungary, Poland, and Slovakia, all age categories differ in the number of people with a duration of employment of up to one year. In the Czech Republic, there is a significant difference only between the youngest group and the other two. In all countries, the largest number of people with employment up to one year is in the age group 25-54 years.

Conclusions

This analysis of unemployment among different age groups presents differences related to different variables, the sample of countries, the time horizon, and the statistical method used.

Based on received data, unemployment decreases with age. The 15-24 group shows significantly higher unemployment than the other two groups. A gender unemployment difference was confirmed only in the Czech Republic and Slovakia. Unemployment has risen during the Covid-19 pandemic. An unemployment gap before and during Covid-19 was not confirmed for females. The T-Test confirmed a difference in unemployment before and during the crisis in the age categories 15-24 and 25-54. In Hungary, Poland and Slovakia, all age categories differ in the number of people with a duration of employment of up to one year. In the Czech Republic, there is a significant difference only between the youngest group and the other two. In all countries, the largest number of people with the employment of up to one year are in the age group 25-54 years. In none of the examined countries was a gender unemployment gap before Covid-19 proved.

If this analysis is correct, the prospects of unemployment in the surveyed countries seem to be rather turbulent for the younger workforce. More comparative analyses such as this are to be recommended because unemployment rates are going to fall to historic lows before the Covid-19 pandemic ends. In addition to socio-economic and technological changes, more people have the possibility of working from home compared with past crises. This means that the rate of unemployed people was not so high. The lesson from the crisis of the 1930s is that if the current crisis leads to a similarly bad downturn, the policy reaction in terms of greater state intervention will not be conducive to improved growth prospects (Crafts, 2011). This necessitates a focus on apprenticeships, onsite jobs, or remote jobs for all in the labor market.

Implications

This study investigated the impact of unemployment and job tenure in different generation groups about age and gender in V4 and Austria in the pre-Covid era and during the pandemic. Like the Great Recession and the recessions of the 1980s, the 90s, the early 2000s, and the 2010s, the Covid-19 recession caused sustained but unequal high unemployment. The future holds both significant obstacles and possibilities for the different workforce generations. Research conducted in this study indicates that the younger generations are more affected than the older generations. However, policy adjustments and investments in modern technology and e-education can help to improve the job market.

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