UNEMPLOYMENT IN THE CONTEXT OF MINIMUM WAGE CONCEPT IN SLOVAKIA[*]

Andrea Tkacova [1], Beata Gavurova [2*], Katarina Melasova [3], Peter Snopko [4]

[1,4]Technical university of Košice, Faculty of Economics, Department of Finance, Němcovej 32, 041 01 Košice, Slovakia
[2] Technical University of Kosice, Faculty of Mining, Ecology, Process Control and Geotechnologies, Letná 9, 042 00 Košice, Slovakia
[3] Technical University of Kosice, Faculty of Aeronautics, Rampová 7, 041 21 Košice, Slovakia

E-mails:[1]andrea.tkacova@tuke.sk; [2*]beata.gavurova@tuke.sk (Corresponding author); [3]katarina.melasova@tuke.sk; [4]peter.snopko@student.tuke.sk

Abstract. The aim of study is to identify an impact of the minimum wage concept on the unemployment rate in Slovakia from 1993 to 2020. Linear regression tests an impact of the Kaitz index, minimum wage and living wage rate, GDP, unemployment rate of people with basic education and progressive taxation. In case the minimum wage increase is less profound than the average wage increase, and a difference between the minimum wage and the living wage is being continually deepened, then the unemployment rate may be decreased. The Slovak unemployment rate may decrease by the GDP growth and by decreasing the number of citizens with basic education.

Keywords: minimum wage; unemployment rate; the Kaitz index; linear regression

1. Introduction

The minimum wage has been a topic of numerous economic studies, which led to contradictory results since the 19th century. Even at present, opinions of many economists differ when considering to what extent the minimum wage impacts unemployment, efficiency of labour market and/or social security of workers (Chytilová & Frejlich, 2020). Innovative approaches have also been implemented by business (Kolková & Ključnikov, 2021; Kljuchnikava, 2022) and by governments to minimize unemployment issues in various markets (Ključnikov et al.,

2020a; Ključnikov et al., 2020b). Standard economic theory describes the minimum wage as a certain form of rigidity in labour market (Mankiw, 2010; Bartókova & Gontkovičová, 2014; Přívara, 2019a,b; Přívara & Rievajová, 2021). There exist many studies about minimum wage and its impact on employment. Various authors show that the minimum wage has a negative impact on employment, especially in terms of young employees without any practice and low-qualified employees (Currie & Fallick, 1996; Neumark & Wascher, 2007; Herr et al, 2009; Neumark et al; 2009; Gontkovičová et al., 2015; Štefančík et al. 2021; Ighoshemu, & Ogidiagba, 2022). However, an effect may be statistically significant in certain sectors with a higher rate of low-qualified job positions (for example, fast-food restaurants in Neumark & Wascher, 2000), while it may differs depending on how mature is economy of a particular region (for example, construction sector in West and East Germany in König & Möller, 2007). Possible wage reduction due to the inflow of cheap labour force.

On the other hand, Card and Krueger (1994) find a positive relation between minimum wage increase and employability. Similar opinion presents also Novak et al. (2016). However, inflow of cheap labour such as migration of foreign people causes decreases in wages (Přívarová et al., 2022). Since there is an increasing trend in a rising official migrant population in Slovakia (Přívara & Kiner, 2020), this fact might also affects unemployment rate of this country. Schmitt (2013) states that the minimum wage may also have a positive impact on employment due to higher rate of work motivation on labour supply side. High work motivation also increases commitment of employees to their firms where they work (Cizrelioğulları & Babayiğit, 2022). In general, Schmitt (2013) believes that a slight increase of the minimum wage has none or only a small impact on a total employment. Many studies determined insignificant and/or no effects on employment after the minimum wages increase (Card, 1992; Card & Krueger, 1995; Card & Krueger, 1998; Card & Krueger; 2000; Dickens & Draca, 2005). Other studies are focused on the minimum wages in specific sectors (Machova & Vochozka, 2019, Bartos et al., 2021, Vochozka, Rowland & Vrbka, 2016, Rowland et al. 2021). Stehel, Horak and Vochozka (2019) describe stuation in agricultural sector, where the motivation is base mainly on family heritage. Very special situation is in mining industry. It is combination of higher minimum wages, early retirement and others (Vochozka et al. 2021, Vochozka et al. 2020a). Minor effect of the minimum wage on employment may be explained by the fact that many employers search for various channels how to compensate increased labour costs. Solution would be for example, reduced working-time, limitation of non-monetary benefits, reduction of their profits, or reduction in remuneration of those employees with higher wages (Schmitt, 2013). However, Vochozka et al. (2020b) identified correlation between minimum wage and company profitability. Reducing of staff turnover would represent one of many other channels. Consequently, it may lead to a slowdown in job creation in some specific sectors, especially for young people. However, there will not be an immediate negative effect on a total employment (Meer and West, 2013; Grumstrup et al., 2021; Kabir, 2021; Galstyan, Grabowska & Bačiulienė, 2021). Employers may reflect the minimum wage increase into higher prices for consumers (see minimum wage increase in Hungary according to Harasztosi and Lindner, 2019). It is evident that there does not exist any clear and quantitatively relevant relationship between minimum wage development and employment. Many empirical studies conclude that higher minimum wages compress wage structure and change income distribution. Low-paid and less-qualified workers make profit from a higher minimum wage and the minimum wage increase reduces poverty to a certain extent (Card & Krueger, 1995; Dolado et al., 2000; König & Moller, 2007; Sahoo & Pradhan, 2021; Vorobeva & Dana, 2021, Kliuchnikava, 2022).

The study aims at identifying an impact of the minimum wage concept on the unemployment rate in Slovakia from 1993 – 2020. However, the authors do not deny different situation in abroad, for example different minimum wage, different unemployment ratio or different exchange rate (Vochozka, Horak & Suler, 2019). Present research indicates that there does not exist any unequivocal agreement with regard to minimum wage impact on labour supply for the unemployed in the labour market. Conclusions of numerous studies differ across the countries as a consequence of differences in the labour market and institutional differences. This study aims at researching the minimum wage impact on the unemployment rate in the context of significant variables, such as average wage and living minimum wage that influence the Slovak labour market. Similarly, it examines the GDP level, the

unemployed rate with basic education and the application of tax policy by means of progressive taxation. The use of the Kaitz index, that is frequently used in many foreign studies on this topic, is considered as very beneficial. Econometric analysis of linear regression model is used to examine an impact of the above-mentioned exogenic factors. For these reasons, this study also differs from other studies that emphasize the positive contributions of SMEs in the reduction of unemployment rate in Slovakian (Civelek et al., 2020; Ključnikov et al., 2022; Civelek & Krajčík, 2022) and other markets (Amoah et al., 2021).

2. Literature Overview

Currently published studies have determined that minimum wage impact on employment differs depending on the country observed. Broecke, Forti and Vandeweyer (2015) found out that there is a minimum or no impact on employment if the minimum wage changes. On the contrary, Neurmark and Corella (2019) concluded that the effects of the minimum wage on employment are predominantly negative, once the MW is higher and binding within the formal sector and for vulnerable workers. Harasztosi and Lindner (2019) confirmed this fact on the case of Hungary and the study by Vodopivec (2015) confirmed this fact on the case of Slovenia. In these countries, there is a relatively high ratio of the minimum wage on average wage, which is also in accordance with the study by Neumark and Corella (2019).

Inconsistent results of the minimum wage impact on unemployment are evident in case of those countries which have low level of this variable. Hinnosar and Rõõm (2003) identified negative impact in the nineties in Estonia. Ferraro, Hänilane, & Staehr (2018), who examined the period from 2013 to 2016 in Estonia, determined no statistically significant impact.

Melnyk (1996) examined an impact of the minimum wage increase on employment and unemployment rate during the period 1991 – 1995 in Poland. The results demonstrated significant negative impact of the minimum wage increase on the unemployment rate. Majchrowska and Zolkiewski (2012) confirmed this conclusion on a sample of young employees during the period 2005 – 2010.

Steward (2004) estimated an effect of the minimum wage implementation on employment in low-wage workers during the period 1999 – 2001 in the Great Britain. Neumar and Wascher (2007) estimated, by means of regression, the minimum wage impact on unemployment and long-term unemployment. The results showed that the minimum wage increase leads to long-term unemployment increase, especially in the group of young men. Fialová and Mysíková (2009) confirmed negative impact of the minimum wage on regional unemployment in the Czech Republic in their analysis of regional panel data from 1995 to 2004.

Pícl et al. (2014) examined the minimum wage impact in the Czech Republic from 2000 to 2012. The regression model was used to determine that the minimum wage impact on total unemployment is statistically insignificant. However, the impact of the GDP, education of population in the Czech Republic and presence of progressive taxation are considered as statistically significant.

Similarly, Pavelka et al. (2014) did not prove any statistically significant impact of the minimum wage on unemployment rate in the Czech Republic. On the contrary, the team of authors confirmed an impact of the GDP growth rate. Soukup et al. (2018) concluded in the study that the minimum wage increase by 1% leads to a higher number of unemployed workers in full-time jobs in the entire economy of the Czech Republic by 0.2%. Chytilová and Frejlich (2020) monitored period from 2006 to 2018. The authors examined an impact of the following variables: the GDP growth rate, inflation rate, unemployment benefit and social security benefits and the Kaitz index. In the Czech Republic, an impact of the minimum wage increase on unemployment was proved as statistically insignificant. Similarly, both, hypothesis of a negative impact of the GDP growth rate on unemployment and hypothesis of a positive impact of unemployment benefit on this variable were not rejected. The minimum wage increase during the period 2011 – 2018 had a positive impact on the unemployment rate of

women in the labour market. On the other hand, some researchers declare the importance of other players such as Czech SMEs in the creation of job opportunities for unemployed people (Ključnikov et al., 2021; Civelek et al., 2021; Žufan et al., 2020).

Brezová and Pániková (2011) monitored the quarterly data from 1994 to 2010 in the Slovak labour market. The authors confirmed a negative impact of the minimum wage on employment, while size and effect of this impact differed depending on employment type. Hidas and Žúdel, (2016), the Institute of Financial Policy, confirmed that even the minimum wage increase has a statistical meaning, it has a low year-on-year impact on employment based on the intersectional analysis of year-on-year data from 2008 to 2014. Also, these authors concluded that the minimum wage may have a higher impact on young workers as opposed to older ones, and in poorer regions as opposed to Bratislava. Ondruš et al. (2017) assumed that the minimum wage and its reasonable increase does not have a negative impact on economic growth and on employment. The team of authors came to this conclusion based on the analysis of empirical studies of various countries in the world. On the contrary, both of these areas showed many examples when the minimum wage had and may have a positive impact. The authors believe that even in Slovakia, the minimum wage increase leads, in a combination with tax credits, to a reduction of social disparities and the government should approach it in 'good' times and when labour productivity grows. Zeman (2018) analysed unemployment in Slovakia during the period 1998 – 2016. The author concluded that in those regions, where the rate between minimum wage and average wage is higher, the minimum wage considerably limits a creation of new working opportunities rather than in economically more developed regions. Also, author suggests the following as the main problems of unemployment in Slovakia: low level of skills, decreasing tendency in demand for manual workers, high level of legislation and bureaucracy, low mobility of workforce and also a negative impact of the minimum wage increase in the labour market (Přívara et al., 2018; Přívara, 2019, 2021).

3. Data and Methods

The study is based on the analysis of already existing studies, such as Hinnosar and Rõõm (2003); Melnyk (1996); Fialová and Mysíková (2009); Pícl and Richter (2014); Chytilová and Frejlich (2020); Zeman (2018). It monitors annual data for the period 1993 – 2020 in Slovakia. These data were obtained by a combination of numerous sources, specifically the Statistical Office of the Slovak Republic, Eurostat and the Ministry of Labour, Social Affairs and Family of the Slovak Republic. The group of economic indicators, such as unemployment rate (%), minimum wage (EUR), average wage (EUR), GDP (EUR billion current prices), living minimum (EUR), unemployment rate of people with basic education (%), presence of progressive taxation (dummy variable Yes/No in a particular year) was selected on the basis of empirical studies.

The principal subject of the study is to quantify an impact of these explanatory variables on a response variable, the unemployment rate difference **UNEMPL_TOT**. The response variables are selected based on the analysed empirical studies. The most significant variable is **Kaitz index (KAITZ)** that is defined as a rate of nominal minimum wage and average gross salary (Kaitz, 1970). The paper uses annual variation of this rate. The Kaitz index may explain a willingness of people to work for such a minimum wage. As Weber (1912) and many other socially oriented types of economists suggest the index growth should decrease an unemployment. On the other hand, unemployment would increase in case neoclassical approach to the minimum wage is used, which was represented by Stigler (1946), and/or even by more recent studies, such as Aaronsona and Frencha (2007). This assumption is even used in the presented study. Stewart (2004) indicated that given index does not necessarily influence unemployment. The presented study assumes that the closer minimum wage is to average wage, the lower unemployment, which results in a lower social disparity rate in a society. Consequently, once this ratio is used, it excludes a research of the minimum wage impact itself due to a high correlation coefficient value (0.884) of a variable in relation to the Kaitz index. Also, a high correlation value was achieved in the year-on-year changes of variables (0.775).

Figure 1 displays the year-on-year change development of the minimum wage, the average wage and the Kaitz index in the year-on-year changes.
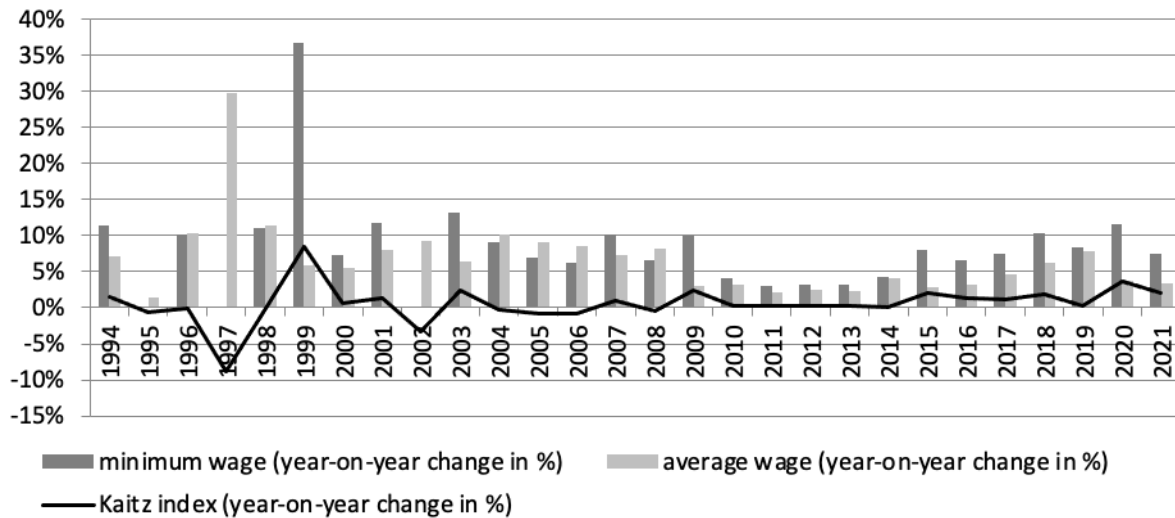

Figure 1. Development of the year-on-year change of the minimum wage, the average wage and the Kaitz index
Source: own calculation

Share of the minimum wage of the living minimum (MW/LM) represents a minimum level of income to provide food and other basic personal needs. Model uses the year-on-year change of this ratio. In general, setting the minimum wage above the level of the living minimum increases workers' productivity (Webb, 1912). People prefer social benefits to job search when the minimum wage is closer to the living minimum. On the other hand, people are more motivated to work if value of the minimum wage is farther from the living minimum, in a positive direction (Pollin, 2007). Model presumes that unemployment decreases if a share of the minimum wage of the living minimum increases.

In case of the **GDP growth rate (GDP_G)**, it is supposed that an economic expansion leads to a growth of consumption and investments, which subsequently impacts an unemployment decrease. It means that a negative correlation between the unemployment rate and the GDP growth rate is present and expressed by the Okun's Law. Also, results of the following studies confirm this fact: Pavelka et al. (2014), Pícl and Richter (2014) and Chytilová and Frejchl (2020). Model assumes that an unemployment decreases with the GDP growth rate.

The unemployed rate with basic education (UNEMPL_BE) was already determined as a significant variable in the studies by Currie and Fallick (1996), Neumark and Wascher (2007), Herr, Kazandziska and Mahnkopf-Praprotnik (2009), Neumark et al. (2009). Studies' results conclude that the more individuals with basic education, the harder their employability and thus, unemployment problem is more deepened. Model uses the year-on-year change of variable.

Progressive taxation (PT) is also included in the study by Pícl and Richter (2014) who led similar research in the Czech Republic. The research resulted in the fact that progressive taxation has a negative impact on a development of unemployment. Progressive taxation is depicted by a dummy variable that has value 1 in those years when progressive taxation of personal income in Slovakia was present (1993-2003, 2013-2020), and value 0 in those years when flat tax was present in Slovakia (2004-2012).

Regression model is applied to estimate the explanatory variables impact on the unemployment rate, while all of the tests and estimates are done at 10% significance level.

Econometric model has a following pattern:

$$UNEMPL\_TOT = \beta 0 + \beta 1 KAITZ + \beta 2 MW/AW + \beta 3 GDP + \beta 4 UNEMPL\_BE + \beta 5 PT + \varepsilon \qquad (1)$$

Table 1 presents an expected impact of selected variables on the unemployment rate on theoretical basis.

Table 1. Overview of response variables and their expected impact on the unemployment rate

Abbreviation	Type of variable	Presumption of effect
KAITZ	quantitative	+
MW/LM	quantitative	-
GDP	quantitative	-
UNEMPL_BE	quantitative	+
PT	dummy	-

Source: own elaboration based on the studies by Aaronson and French (2007), Pollin, (2007), Neumark et al. (2009), Pícl, Richter (2014), Chytilová and Frejlich (2020)

Assumptions of linear regression use are tested before the model's interpretation. The Jarque-Bera test is used to test the assumption of the model's normality of residuals. The second assumption is homoscedasticity (uniform scattering) of residuals, where the Breusch-Pagan test is applied. The third assumption, that is being very frequently interrupted, especially in modelling of time rows, is that a random component of the model is not auto-correlated. The Durbin-Watson test is used to test this assumption. The last assumption is, that there is no multi-linearity in the model, that is, a relation between explanatory variables. Thus, variance inflation factor (VIF) is used to assess this last assumption.

Results

Modelling was performed in a software environment of R programming language, while using linear regression via the method of least squares. Table 2 provides the results.

Table 2. Results in R program according to the method of least squares

Variable	Coefficient	Estimate Error	T ratio	P-value
const	12.71264	5.10379	2.491	0.023383 *
KAITZ	0.42234	0.23913	1.766	0.095320 .
MW/LM	-0.14128	0.03046	-4.637	0.000235 ***
GDP_G	-0.32216	0,11475	-2.808	0.012111 *
UNEMPL_BE	0.13543	0.09108	1.487	0.155344
PT	3.19294	1.11769	2.857	0.010918 *

Source: own elaboration

Assumptions of linear regression use are tested before the model's interpretation. The normality of residuals assumption was fulfilled on the basis of asymptotic p-value of the Jarque-Bera test (0.407). Also, the assumption of uniform scattering of residuals (value of tested criterium is 8.5209) was fulfilled based on the testing of the Breusch-Pagan test p-value (0.1298). Results of the Breusch-Pagan test did not prove any heteroscedasticity of error member as p-value is higher than 0.10. The Durbin-Watson test determined that the test's P-value is close to zero, that is, the model has a positive auto-correlation (value of tested characteristics is 0.90643). The variance inflation factor (VIF) was used to test multicollinearity. Table 3 presents its results.

Table 3. Values of variance inflation factor

Coefficient	Estimate Error
12.71264	5.10379
0.42234	0.23913
-0.14128	0.03046
-0.32216	0.11475
0.13543	0.09108

Source: own elaboration
.

In all of the explanatory variables, values of variance inflation factor are lower than or equal to 5 that represents a sufficient level to assume that the model is not burdened by a mutual relationship of individual explanatory variables (there is no multicollinearity). Auto-correlation problem was solved via transformation, while using weighted variance-covariance matrix. Consequently, there was created a new model whose regression coefficients are the same as in the previous case, but based on this new model, it is also possible to determine a statistical significance of regression coefficients and their explanatory variables (Table 4).

Table 4. Model's results

Variable	Coefficient	Estimate Error	T ratio	P-value
const	12.71264	1.723741	7.3750	1.085e-06 ***
KAITZ	0.42234	0.212961	1.9832	0.0637418
MW/LM	-0.141281	0.034368	-4.1109	0.0007293 ***
GDP_G	-0.322156	0.067534	-4.7703	0.0001777 ***
UNEMPL_BE	0.135431	0.074523	1.8173	0.0868390
PT	3.19294	1.551868	2.0575	0.0553145

Source: own elaboration

Final model of selected variables' impact on the unemployment rate in Slovakia has the following pattern:

$$UNEMPL\_TOT = 12.71 + 0.42 KAITZ - 0.14 MW/AW - 0.32 GDP + 0.14 UNEMPL\_BE + 3.19 PT + \varepsilon \qquad (2)$$

All explanatory variables at 10% significance level are statistically significant. Both variables, KAITZ and MW/LM, that explain a relationship of the minimum wage to average wage and living minimum are statistically significant. Also, these variables confirmed the minimum wage impact on the unemployment rate in Slovakia.

In case of the Kaitz index, neoclassical approach to the minimum wage, that was represented by Stigler (1946), and/or more recent studies by Aaronsona and Frencha (2007), was confirmed. Thus, in Slovakia, the unemployment rate increases when the minimum wage share of the average wage increases. Zeman (2018) confirms this fact at the regional level. Poorer regions, where a difference between minimum wage and average wage is low, which causes a decrease of job decline, may experience many problems due to this relation. Consequently, the higher minimum wage, the higher unemployment rate. However, there is a difference in the relationship between the minimum wage and the living wage to response variable. The assumption, Polina (2007), that if the minimum wage share increases of the living minimum income, then unemployment decreases, was confirmed. Once this share increases, there is also evident a willingness of people to work and to prefer work to receiving social security benefits. Also, model confirmed that once the GDP grows, then unemployment decreases. Similarly, the year-on-year difference of the unemployed with basic education rate is considered as statistically significant variable. Growth of this variable has a positive impact on the unemployment rate increase. The last monitored variable was a presence of progressive taxation. Pícl (2014) assumed a negative impact of this variable on the unemployment rate in the labour market in the Czech Republic. It may be concluded, based on the model's results in the Slovak labour market that a presence of progressive taxation causes the unemployment rate increase and it is considered as a demotivation factor as opposed to that period, when flat tax was launched.

Conclusions

The main subject of this study is to identify an impact of the minimum wage concept on the unemployment rate in Slovakia from 1993 to 2020. Econometric model examined an impact of ratios, especially the Kaitz index, according to modern foreign studies, and it did not examine only an impact of the minimum wage on the unemployment rate. Both, the minimum wage amount and a relation to such variables as average wage and living minimum value are very important in the labour market. Econometric model confirmed that both ratios and the minimum wage have a statistically significant impact on the unemployment rate in Slovakia. However, this impact is different depending on a selected ratio. In case of a relation to the average wage, there is a positive dependency, that is, ratio increase influences the unemployment rate increase. It is inevitable to ensure that the average wage would grow faster than the minimum wage in order to achieve a positive development in the labour market. Also, present economic development, that has impact on a development of the average wage, shows that the minimum wage in Slovakia increases very fast and it influences the unemployment rate increase. It is possible to confirm this fact by analysis of the monitored period from 1993 to 2020, when the average wage increase was of 7%, and the minimum wage increase was of 8%. New calculations of the minimum wage for the next period should consider the average wage increase rate. However, the period of a negative economic development poses a question of how the minimum wage level should be set correctly? The job positions, which were evaluated by the minimum wage, may be lost due to the economic recession impact. Subsequently, the average wage would artificially increase that could put pressure on the minimum wage increase. Such conclusion would be destructive for the labour market, as it would limit the possibilities to employ for young people and low-qualified workers, especially in the least developed regions. In practice, it is necessary to take into consideration the Kaitz index in order to develop the unemployment rate more complexly, at least via development of other macro-economic indicators. In case of the GDP, model's results confirm this statement, that is, the higher GDP, the lower unemployment. Modified version of the Kaitz index could be suggested. It would be possible to compare minimum net pay and net average wage, and/or minimum wage costs and average wage costs.

Ratio of the minimum wage and the living minimum income is considered as a statistically significant variable in the model. There has been a significant widening of disparities between the living minimum income and the minimum wage since 1993 in Slovakia, which should motivate people to job search in a positive way. Model's results confirmed that the year-on-year growth of a change of ratio in the minimum wage and the living minimum influences the unemployment rate decrease. It means, that in case of this variable, Slovakia set a correct policy of the labour market. However, the living minimum problem is more complex. Generally, the living wage recipients are those families, where none of its members work and they have many dependent children. In 2021, such Slovak family with three dependent children has the living wage in the amount of 668 Euro. In case, one of the parents would decide to work, at least for the minimum wage, the entire family financial situation would only slightly improve (it would be necessary to add the family allowance per three dependent children and consider tax bonus to the minimum wage in the amount of 623 Euro). The question therefore arises whether the minimum wage fulfils its social and protective function. Consequently, there is a demotivation to work for the minimum wage, and there appears a space for illegal work. However, the group of people who receives the social benefits has a great problem with education level that disqualifies them in the selection procedures. Almost 19% of people who receives the minimum wage has the basic education. The analysis of this study confirmed this fact. It proves that the more individuals with basic education, the deeper unemployment problem.

The article aims at identifying an impact of the minimum wage concept on the unemployment rate in Slovakia from 1993 to 2020. Model's results confirmed that the minimum wage has a statistically significant impact on the unemployment rate during the monitored period in Slovakia. However, it requires deeper interpretation whether this impact is positive or negative. It is necessary to set the minimum wage growth in a way it is not faster than the year-on-year increase of the minimum wage in order to achieve the unemployment rate decrease. Also, it is ideal to perform the minimum wage freeze during the economic recession. Unemployment may also be decreased

by increasing the difference between the minimum wage and the living minimum, and by increasing the educational level of a population. Model proved that positive impacts of the GDP on unemployment. Changes that would occur in case of progressive taxation may be interpreted only in case of its existence. Similarly, model proved that unemployment was higher in case of progressive taxation rather than in case of alternate form, that is flat tax. It would be inevitable to perform more detailed analyses in case of this variable. Also, it would be very beneficial to monitor progressive taxation impact on, for example, a group of the unemployed with basic education as this group belongs to the group of the minimum wage jobs.

References

Amoah, J., Jibril, A.B., Luki, B.N., Odei, M.A., & Yawson, C.(2021). Barriers of SMEs' sustainability in sub-saharan Africa: a pls-sem approach. *International Journal of Entrepreneurial Knowledge*, 9(1), 10-24. http://dx.doi.org/10.37335/ijek.v9i1.129

Bartóková, Ľ., & Gontkovičová, B. (2014). *Labour Markets of EMU Countries in the Context of OCA*. International Conference on Emerging Markets Queries in Finance and Business. *Procedia Economics and Finance*, 15, 146-153. https://doi.org/10.1016/S2212-5671(14)00464-X

Bartos, V., Vochozka, M., & Janikova, J. (2021). Fair value in squeeze-out of large mining companies. *Acta Montanistica Slovaca*, 26(4), 712-731. https://doi.org/10.46544/AMS.v26i4.10

Brezová, M., & Pániková. L. (2009). *Influence of minimum wage on labour market – case of Slovak Republic*. Ecomod, Faculty of Social Sciences of the University of Ottawa.

Broecke, S., Forti, A., & Vandeweyer, M. (2015). The effect of minimum wages on employment in emerging economies: a survey and meta-analysis. *Oxford Development Studies*, 45(3), 366-391. https://doi.org/10.1080/13600818.2017.1279134

Card, D. (1992). Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage. *Industrial and Labor Relations Review*, 46(1), 38-54. https://doi.org/10.3386/w4058

Card, D., & Krueger, A. B. (1995). Time-Series Minimum-Wage Studies: A Meta-analysis. *The American Economic Review*, 85(2), 238–43.

Card, D., & Krueger, A. B. (1998). *A Reanalysis of the Effect of the New Jersey Minimum Wage Increase on the Fast-Food Industry with Representative Payroll Data*, Princeton University Working Paper, 293. https://doi.org/10.3386/w6386

Card, D., & Krueger, A. B. (2000). Minimum Wages and Employment: A Case Study of the Fastfood Industry in New Jersey and Pennsylvania –Reply, *American Economic Review*, 90(5), 1397-1420. https://doi.org/10.1257/aer.90.5.1397

Chytilová, H., & Frejlich, P. (2020). Kontroverze konceptu minimální mzdy, aplikace na Českou republiku. *Politická Ekonomie*, 68(4), 423 442. https://doi.org/10.18267/j.polek.1285

Civelek, M., Gajdka, K., Světlík, J., & Vavrečka, V. (2020). Differences In The Usage Of Online Marketing And Social Media Tools: Evidence From Czech, Slovakian and Hungarian SMEs. *Equilibrium. Quarterly Journal of Economics and Economic Policy,* 15(3), 537–563. http://dx.doi.org/10.24136/eq.2020.024

Civelek, M., Ključnikov, A., Fialova, V., Folvarčná, A., & Stoch, M. (2021). How Innovativeness Of Family-Owned SMEs Differ Depending On Their Characteristics? Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 16(2), 413-428. https://doi.org/10.24136/eq.2021.015

Civelek, M., & Krajčík, V. (2022). How Do SMEs From Different Countries Perceive Export Impediments Depending On Their Firm-Level Characteristics? System approach. *Oeconomia Copernicana*, 13(1), 55–78. http://dx.doi.org/10.24136/oc.2022.002

Cizrelioğulları, M.N., & Babayiğit, M.V. (2022). Effects of High-Performance Work System on Job Satisfaction: The Mediating Role of Psychological Capital in the Hotel Employees of North Cyprus. *Journal of Tourism and Services*, 24(13), 43-70. http://dx.doi.org/10.29036/jots.v13i24.284

Currie, J., & Fallick, B.C. (1996). The Minimum Wage and the Employment of Youth Evidence from the NLSY. *The Journal of Human Resources*, 31(2), 404-428. https://doi.org/10.2307/146069

Dickens, R., & Draca, M. (2005). T*he Employment Effects of the October 2003 Increase in the National Minimum Wage.* Discussion Paper No. 693, Centre for Economic Performance.

Dolado, J. J., Felgueroso, F., & Jimeno, J. F. (2000). *The Role of the Minimum Wage in the Welfare State: An Appraisal*, Discussion Paper No. 152, IZA. https://doi.org/10.2139/ssrn.233903

Ferraro, S., Hänilane, B., & Staehr, K. (2018). Minimum wages and employment retention: A microeconometric study for Estonia. *Baltic Journal of Economics*, 18(1), 51–67. https://doi.org/10.1080/1406099X.2018.1485422

Fialová, K., & Mysíková, M., (2021). Do low minimum wages disserve workers? A case study of the Czech and Slovak Republics. *Baltic Joutnal of Economics*, 21(1), 43-59. https://doi.org/10.1080/1406099X.2021.1917844

Galstyan, A., Grabowska, M., & Bačiulienė, V. (2021). Economic Development and Migration After EU Accession: The Case of Baltic States. *Pressburg Economic Review*, 1(1), 47-55.

Gontkovičová, B., Mihalčová, B., & Pružinský, M. (2015). Youth Unemployment – Current Trend in the Labour Market? *Procedia Economics and Finance*, 23, 1680-1685. https://doi.org/10.1016/S2212-5671(15)00554-7

Grumstrup, E., Sørensen, T., Misiuna, J., & Pachocka, M. (2021). Immigration and Voting Patterns in the European Union: Evidence from Five Case Studies and Cross-Country Analysis. *Migration Letters*, 18(5), 573-589. https://doi.org/10.33182/ml.v18i5.943

Harasztosi, P., & Lindner, A. (2019). Who pays for the minimum wage? *American Economic Review*, 109(8), 2693–2727. https://doi.org/10.1257/aer.20171445

Herr, H., & Kazandziska, M., Mahnkopf-Praprotnik, S. (2009). *The Theoretical Debate about Minimum Wages.* Global Labour University Working Paper No. 6, Berlin.

Hidas, S, & Žúdel, B. (2016). *Malý vplyv zvyšovania minimálnej mzdy na nezamestnanosť.* Inštitút finančnej politiky, Ekonomická analýza 34. Bratislava.

Hinnosar, M., & Rõõm, T. (2003). *The impact of minimum wage on the labour market in Estonia: An empirical analysis.* WP8 of Eesti Bank. Eesti Bank.

Ighoshemu, B. O., & Ogidiagba, U. B. (2022). Poor governance and massive unemployment in Nigeria: as causes of brain drain in the Buhari administration (2015-2020). *Insights into Regional Development,* 4(2), 73-84. https://doi.org/10.9770/IRD.2022.4.2(6)

Kabir, H. (2021). Notion of Belonging in the Nation-State: Gendered Construction of International Migration Aspirations among University Students in Bangladesh. *Migration Letters*, 18(4), 463-476. https://doi.org/10.33182/ml.v18i4.1158

Kaitz, H. (1970). Experience of the Past: The National Minimum. Youth Unemployment and Minimum Wages. *U.S. Department of Labor*, 30–54.

Kliuchnikava, Y. (2022). The Impact of the Pandemic on Attitude to Innovations of SMEs in the Czech Republic. *International Journal of Entrepreneurial Knowledge,* 10(1), 34-45. https://doi.org/10.37335/ijek.v10i1.131

Ključnikov, A., Civelek, M., Vozňáková, I., & Krajčík, V. (2020a). Can Discounts Expand Local And Digital Currency Awareness Of Individuals Depending On Their Characteristics? *Oeconomia Copernicana,* 11(2), 239–266. https://doi.org/10.24136/oc.2020.010

Ključnikov, A., Civelek, M., Polách, J., Mikoláš, Z., & Banot, M. (2020b). How Do Security And Benefits Instill Trustworthiness Of A Digital Local Currency? *Oeconomia Copernicana*, 11(3), 433–465. https://doi.org/10.24136/oc.2020.018

Ključnikov, A., Civelek, M., Fialova, V., & Folvarčná, A. (2021). Organizational, Local, And Global Innovativeness Of Family-Owned SMEs Depending On Firm-Individual Level Characteristics: Evidence From The Czech Republic. *Equilibrium. Quarterly Journal of Economics and Economic Policy,* 16(1), 169–184. https://doi.org/10.24136/eq.2021.006

Ključnikov, A., Civelek, M., Klimeš, C., & Farana, R. (2022). Export Risk Perceptions Of SMEs in Selected Visegrad Countries. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 17(1), 173–190. https://doi.org/10.24136/eq.2022.007

Kolková, A., & Ključnikov, A. (2021). Demand Forecasting: An Alternative Approach Based On Technical Indicator Pbands. Oeconomia Copernicana, 12(4), 863–894. https://doi.org/10.24136/oc.2021.028

König, M., & Möller, J. (2007). *Mindestlohneffekte des Entsendegesetzes?* Eine Mikrodatenanalyse für die deutsche Bauwirtschaft, Discussion Paper No. 30. *IAB*. Institut für Arbeitsmarkt-und Berufsforschung, Nürnberg.

Machova, V., & Vochozka, M. (2019). Analysis of business companies based on artificial neural networks. In J. Horak (Ed.), *Innovative Economic Symposium 2018—Milestones and Trends of World Economy (IES2018)* (61). VSTE. https://doi.org/10.1051/shsconf/20196101013

Majchrowska, A., & Żółkiewski, Z. (2012). The impact of minimum wages on employment in Poland. *Investigaciones Regionale*, 24, 211–239.

Mankiw, G.N. (2010). Macroeconomics. 7th edition. Worth Publishers, New York.

Meer, J. & West, J. (2013). Effects of the Minimum Wage on Employment Dynamics. NBER Working Paper No. 19262 https://doi.org/10.3386/w19262

Melnyk, A. M. (1996). The Minimum Wage and Unemployment in Poland: Lessons for Cuba´s Transitions. ASCE - Cuba in Transition, 6(126).

Neumar, D. & Wascher, W. (2007). Minimum Wages and Employment. IZA Discussion Paper No. 2570, Institute for the Study of Labor, Bonn

Neumark, D. & Wascher, W. (2000): Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review.* 90 (5), 1362-1396. https://doi.org/10.1257/aer.90.5.1362

Neumark, D., & Corella, L. F. M. (2019). Do minimum wages reduce employment in developing countries? A survey and exploration of conflicting evidence. NBER Working Paper Series, no. 26462. https://doi.org/10.3386/w26462

Neumark, D., Ian Salas, J.M. & Wascher, W. (2009). Revisiting the Minimum Wage Employment Debate: Throwing out the Baby with the Bathwater. NBER Working Paper No. 18681, Cambridge.

Novak, V., Vokoun, M., Stellner, F., & Vochozka, M. (2016). institutional analysis of the contemporary regional labour market in the Czech Republic. *E & M Ekonomie A Management*, 19(3), 4–19. https://doi.org/10.15240/tul/001/2016-3-001

Ondruš, B., Štefánková, I., Líška, P., & Kramer, T. (2017). Minimálna mzda – empirické zistenia kontra ideologické mýty. Národný projekt Centrum sociálneho dialógu II. ITMS projektu: 312031B970

Pícl, M., Brhlík, I., & Ondroušek, M. (2014). *Vliv minimální mzdy na nezaměstnanost v ČR*. Úřad vlády České republiky, Odbor analýz a informací.

Pícl, M., & Richter, P. (2014). Minimální mzda a její vpliv na nezaměstnanost v ČR. *Acta Oeconomica Pragensia*, 22(6), 51-65. https://doi.org/10.18267/j.aop.458

Pollin, R. (2007). Economic Prospects: Marking the Federal Minimum Wage s Living Wagw. *New Lebor Forum*, 16(2), 103-107. https://doi.org/10.1080/10957960701279306

Privara, A. (2022). Economic growth and labour market in the European Union: lessons from COVID-19. *Oeconomia Copernicana*, 13(2), 355-377. https://doi.org/10.24136/oc.2022.011

Privara, A., Rievajová, E., & Dziura, B. (2018). Unemployment Aspects of Regional Development (The Cases of the Czech and Slovak Republics). *Advanced Science Letters*, 24(9), 6320-6322. https://doi.org/10.1166/asl.2018.13042

Přívara, A. (2019). Citizenship-for-Sale Schemes in Bulgaria, Cyprus, and Malta. *Migration Letters*, 16(2), 245-254. https://doi.org/10.33182//ml.v16i2.735

Přívara, A. (2019). Explaining Emigration Patterns in Estonia, Lithuania, Slovenia and Slovakia. *Geographical Journal*, 71(2), 161-180. https://doi.org/10.31577/geogrcas.2019.71.2.09

Přívara, A. (2021). Labour market efficiency and emigration in Slovakia and EU neighbouring countries. *Economic Research-Ekonomska Istraživanja*, 34(1), 1850-1869. https://doi.org/10.1080/1331677X.2020.1858131

Přívara, A., & Kiner, A. (2020). Immigrant Employment in the Slovak Hospitality Industry: Profiles, Experience,and Education. *Journal of Tourism and Services*, 20(11), 167-182. https://doi.org/10.29036/jots.v11i21.223

Přívara, A., & Rievajová, E. (2021). Migration governance in Slovakia during the COVID-19 crisis. Migration Letters, 18(3), 331-338. https://doi.org/10.1080/1331677X.2020.1858131

Přívarová, M., Martincová, M.,Trnovský, K.& Hačár, D. (2022). Labour Migration and Tourism Flows: the Case of the EU. *Journal of Tourism and Services*, 24(13), 271-289. https://doi.org/10.29036/jots.v13i24.374

Rowland, Z., Blahova, A., & Gao, P. (2021). Silver as a value keeper and wealth distributor during an economic recession. *Acta Montanistica Slovaca*, 26(4), 796–809. https://doi.org/10.46544/AMS.v26i4.16

Sahoo, M., & Pradhan, J. (2021). Adaptation and Acculturation: Resettling displaced tribal communities from wildlife sanctuaries in India. *Migration Letters*, 18(3), 237-259. https://doi.org/10.33182/ml.v18i3.877

Schmitt, J. (2013). Why does the minimum wage have no discernible effect on employment? Working paper, Centre for Economic and Policy Research

Soukup, J, Čadil, J., Macáková, J., & Pavelka, T. (2018). Odhad dopadů změny minimální mzdy na jednotlivá odvětví. Praha: ČMKOS.

Stehel, V., Horak, J., & Vochozka, M. (2019). Prediction of institutional sector development and analysis of enterprises active in agriculture. *E & M Ekonomie A Management*, 22(4), 103–118. https://doi.org/10.15240/tul/001/2019-4-007

Stewart, M. B. (2004). The Employment Effect of the National Minimum Wage. *The Economic Journal*, 114(494), 110–116. https://doi.org/10.1111/j.0013-0133.2003.00200.x

Stigler, G. J. (1946). The Economics of Minimum Wage Legislation. *The American Economic Review*, 36(3), 358–365.

Vochozka, M., Horak, J., Krulicky, T., & Pardal, P. (2020a). Predicting future Brent oil price on global markets. *Acta Montanistica Slovaca*, 25(3), 375–392. https://doi.org/10.46544/AMS.v25i3.10

Vochozka, M., Horak, J., & Suler, P. (2019). Equalizing Seasonal Time Series Using Artificial Neural Networks in Predicting the Euro-Yuan Exchange Rate. *Journal of Risk And Financial Management*, 12(2). https://doi.org/10.3390/jrfm12020076

Vochozka, M., Kalinova, E., Gao, P., & Smolikova, L. (2021). Development of copper price from July 1959 and predicted development till the end of year 2022. *Acta Montanistica Slovaca*, 26(2), 262–280. https://doi.org/10.46544/AMS.v26i2.07

Vochozka, M., Rowland, Z., & Vrbka, J. (2016). Financial Analysis of an Average Transport Company in the Czech Republic. *NASE MORE*, 63(3, SI), 227–236. https://doi.org/10.17818/NM/2016/SI28

Vochozka, M., Vrbka, J., & Suler, P. (2020b). Bankruptcy or Success? The Effective Prediction of a Company's Financial Development Using LSTM. *Sustainability*, 12(18). https://doi.org/10.3390/su12187529

Vodopivec, M. (2015). The employment and wage spillover effects of Slovenia's 2010 minimum wage increase. *European Scientific Journal,* Special edition, 11(10), 82–109.

Vorobeva, E., & Dana, L. P. (2021). The COVID-19 pandemic and migrant entrepreneurship: Responses to the market shock. *Migration Letters*, 18(4), 477-485. https://doi.org/10.33182/ml.v18i4.1400

Webb, S. (1912). The Economic Theory of a Legal Minimum Wage. *Journal of Political Economy*, 20(10), 973–998.

Zeman, M. (2018). Unemployment in Slovakia Between 1998 and 2016 – One of the Systematic problems of the national economy. *Ecoforum,* 7(1), 1-8. https://doi.org/10.1086/252125

Žufan, J., Civelek, M., Hamarneh, I., & Kmeco, Ľ. (2020). The Impacts of Firm Characteristics on Social Media Usage Of SMEs: Evidence from the Czech Republic. *International Journal of Entrepreneurial Knowledge*, 8(1), 102-113. https://doi.org/10.37335/ijek.v8i1.111

Data Availability Statement: More data may be obtained from the authors on a reasonable request.

Author Contributions: Conceptualization: *Tkacova, Gavurova*; methodology: *Snopko, Melasova*; data analysis: *Tkacova, Snopko,* writing—original draft preparation: *Tkacova, Gavurova*, writing; review and editing: *Tkacova, Gavurova*; visualization: *Tkacova, Snopko*. All authors have read and agreed to the published version of the manuscript.

Andrea TKACOVA, PhD. In her research work she has focused primarily on the issue of public finances and finances of local governments with an emphasis on public procurement and employment policy. Her areas of interest also include monitoring and forecasting the economic cycles of the countries of the European Union.
ORCID ID: https://orcid.org/0000-0002-6025-1261

Prof. Beata GAVUROVA, PhD., MBA is an expert in finance, financial analysis and financial risk management. She focuses in her research work on issues of measurement and performance management in various sectors, process management and process optimization, strategic and performance benchmarking. Her dominant research area is the development and testing in the management and performance measurement, the evaluation of methodologies and the preparation of an application platform for innovative management and performance measurement with the support of ICT.
ORCID ID: https://orcid.org/0000-0002-0606-879X

Katarina MELASOVA currently works at the Faculty of Aeronautics of the Technical University of Kosice. Her dominant areas of expertise are macroeconomics and microeconomics. In her scientific and research activities, she focuses mainly on tourism, public health and environmental aspects in the economic dimension.
ORCID ID: https://orcid.org/0000-0002-4370-6674

Peter SNOPKO - In his research work he has focused on monitoring the macroeconomic development of the countries of the European Union with an emphasis on the labor market. Priority is given to the influence of the minimum wage on the development of employment and unemployment and the different approach of EU countries to this issue.
ORCID ID: https://orcid.org/0000-0001-8223-2443

Make your research more visible, join the Twitter account of ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES: @Entrepr69728810