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IMPACT OF SELECTED REGIONAL INDICATORS ON THE PROPORTION OF SUCCESSFUL SELF-EMPLOYERS AND NEW SELF-EMPLOYERS AT THE DISTRICT LEVEL OF SLOVAKIA

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Abstract: *Self-employment support can be analysed in the context of labour market or self-employment sustainability. However, it is also useful to see how regional factors can affect the share of the supported self-employed in all new self-employed at the time of the start of self-employment. The aim of this paper is to investigate the impact of selected regional indicators at the start of business on the share of the supported self-employed in all new self-employed during the period 2013–2015 in districts of Slovakia. We analysed our data using linear regression with some of the independent variables in logarithms. Our results show that higher average district population density (2013–2015) has a positive impact on the proportion of the supported self-employed (2 to 3 years of self-employment since signing the support agreement) in the total number of the new self-employed and logarithm of the average nominal wage has a negative effect.*

Keywords: *self-employed, regional factors, self-employment support*

JEL Classification: J48, L26, H53

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1 Introduction

The self-employment allowance falls under active labour market policy (ALMP), which is implemented through active labour market measures to reduce unemployment. The aim of the support is to create a workplace where the formerly unemployed person is self-employed. The self-employment allowance has been studied from different perspectives, for example, by analysing factors affecting its sustainability (Pisar, Mertinková & Šipikal, 2021) or monitoring long-term sustainability (Wolff, Nivorozhkin & Bernhard, 2015), or following the program's impact on the supported and their future situation in the labour market (Wolff & Nivorozhkin, 2012). Other research looks at the factors of self-employment (Pisar et al., 2022). However, few, if any, studies address the regional factors influencing the number of newly signed self-employment allowance agreements.

Therefore, in this research, we focus on regional factors at the time of starting self-employment at the district level and their impact on the share of the supported self-employed in the total number of the new self-employed in the 2013–2015 period in Slovakia. Specifically, our sample are the self-employed who signed on for support in 2013–2015, and who subsequently met the condition of continuous self-employment for 2-3 years after signing the agreement. Therefore, we follow those who remained successfully self-employed between 2015 and 2018 in Slovakia. The period under review includes the May 2013 change in the law, the length of the need to self-employ after signing the agreement from 2 to 3 years from May 2013. We also track new self-employed workers who started self-employment between 2013 and 2015 and regional factors over the period.

The aim of the research is to assess the impact of selected regional factors at the time of starting self-employment on the share of the newly supported self-employed in the total number of the newly self-employed, at the level of Slovakia's 79 administrative districts. The main reason for selecting the district level is that the Office of Labour, Social Affairs and Family (later as Labour Office) has branches at the district level. Though in some cases, several smaller districts share a single office. Unemployed applicants for support must visit the Labour Office in the district where they plan to practise self-employment (Inštitút zamestnanosti, 2024). The objects of investigation are districts (LAU1), where the dependent variable is the ratio of the supported

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to the total number of the new self-employed at the district level, and the independent variables are the average values of selected indicators in the 2013–2015 period in Slovakia. The following research question was developed to answer the stated objective of the paper: Do regional factors at the time of starting self-employment affect the share of successful public supported self-employed persons in all newly self-employed persons at the district level in Slovakia?

In the future, the research work may be helpful in tracking public interest in this support program and identifying beneficiaries who have been granted self-employment support by the Labour Office and who would go on to meet the condition of remaining in business for at least 2–3 years from the signing of the agreement. The research also shows how selected regional variables at the time of starting a business may affect successful supported self-employers after the end of support divided by the total number of the newly self-employed.

We identify the following limitations to our research: First, the study period is fairly short, spanning three years from 2013 to 2015. The second limitation is that the database of all self-employers also includes the self-employed, freelancers, sole traders and self-employed small farmers. The database of all self-employers may also include supported self-employers. Results may thus be biased. The database of all new self-employed persons may also include those who use self-employment in addition to employment. Next, regional variables are self-employment at the time of implementation. Independent variables are created as average annual values in the years 2013-2015 at the district level. There is also a possibility of spatial correlation across regional variables. Finally, the database of total entrepreneurs includes those who could end their business earlier than before 2 or 3 years.

In the following section, we summarize the results of previous publications evaluating ALMP programs, self-employment, the self-employment allowance, and the regional factors in self-employment and small business. In Section 3, we describe our data and methodology. Our results are presented in Section 4 and discussed in Section 5. Section 6 concludes the paper.

2 Literature review

The existing research on self-employment takes different perspectives. Some

authors focus on spatial impacts (Bashir, Gebremedhin, & Chawdhry, 2014) or regional factors and differences (Botric, 2012; Haapanen & Tervo, 2009), while others compare self-employment and entrepreneurship in urban and rural labour markets (Faggio & Silva, 2014). Others focus on the associations between unemployment and self-employment (Rissman, 2003) or the creation of new businesses (Audretsch, Dohse & Niebuhr, 2015). However, most studies focus more closely on regions and small entrepreneurs (Huggins, Prokop & Thompson, 2017; Naudé et al., 2008; Wyrwich, 2014).

Some research papers investigate ALMP programs (Andersen & Svarer, 2012; Betcherman, Olivas & Dar, 2004), and some focus on self-employment support programs or entrepreneurship support programs for the unemployed (Caliendo & Künn, 2013; Duhautois, Redor & Desiage, 2015; Dvoulety & Hora, 2020; Pisar, Mertinková & Šipikal, 2021; Wolff, Nivorozhkin & Bernhard, 2015; Wolff & Nivorozhkin, 2012).

The aim of ALMP tools is to increase the probability of the unemployed returning to the labour market. ALMP programs aim to prevent an increase in long-term unemployment (Andersen & Svarer, 2012), but some programs failed to show an impact on employment in developing countries (Betcherman, Olivas & Dar, 2004). Entrepreneurship programs have a positive impact on the creation of new enterprises (Bilan & Apostoaie, 2023).

One of the entrepreneurial ALMP programs is the support in starting self-employment for the unemployed. The results of this program vary. For example, in Germany, one type of self-employment program is more effective in less developed regions (Caliendo & Künn, 2013). Most research papers evaluate the start-up and the self-employment support programs as effective (Duhautois, Redor & Desiage, 2015; Wolff, Nivorozhkin & Bernhard, 2015; Wolff & Nivorozhkin, 2012).

Most research focuses on monitoring support and assessing its sustainability or effectiveness (Caliendo & Künn, 2013; Pisar, Mertinková & Šipikal, 2021). To track unemployed people who became self-employed or created start-ups, most authors use sociodemographic variables (Duhautois, Redor & Desiage, 2015; Haapanen & Tervo, 2009; Pisar, Mertinková & Šipikal, 2021, 2022; Simoes, Moreira & Crespo, 2015), length of previous unemployment (Pisar, Mertinková & Šipikal, 2021), financial or economic factors (Haapanen & Tervo, 2009; Pisar, Mertinková & Šipikal, 2021), as well as regional factors

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(Pisar, Mertinková & Šipikal, 2021; Pisar et al., 2022).

In this paper, we focus on tracking selected regional factors at the time of signing the support agreement. The supported self-employed in our sample are supported through a financial contribution. The applicant first submits a business plan to the Labour Office in the district where they plan to register as self-employed (Inštitút zamestnanosti, 2024). Most self-employed persons register their business at or near their place of residence, with the average commute shorter than for employees (Faggio & Silva, 2014). For this reason, we track the self-employed according to their place of self-employment.

Regional factors have varying impacts on self-employment and entrepreneurship. Research so far has mostly studied the impact of regional factors on the sustainability of entrepreneurship (likelihood the business will survive). One relevant factor may be population and its density. For example, population growth has a positive effect on increasing the number of firms (Bilan & Apostoaie, 2023), but according to other literature, it has different effects on microenterprises (Deller, 2010). Findings also vary by population density. For example, population density has a negative effect in the later years but a positive effect on self-employment in the earlier period of 2011 (Fotopoulos & Storey, 2017). However, population density can also have a negative effect on entrepreneurial activity at the time of transition of the economy. As a result, the negative impact of population density decreases (Wyrwich, 2014). New firms can also have a positive effect on population density growth (Bashir, Gebremedhin, & Chawdhry, 2014). Several studies monitor unemployment rates and regional unemployment in relation to the business environment. Increases in unemployment rates induce a decline in self-employment in the region (Cueto, Mayor & Suárez, 2015). In other literature, higher unemployment increases the probability of entry into self-employment (Rissman, 2003) but is associated with a decline in the number of self-employment (Filippopoulos & Fotopoulos, 2024). Botric's results indicate that regions with higher regional unemployment, these regions were not able to promote self-employment (Botric, 2012). Other research reports that in regions with higher unemployment rates, there is an increase in self-employment among individuals who come from self-employed families (Tervo, 2006). This may be because, particularly in rural regions, people choose self-employment rather than remaining unemployed (Faggio & Silva, 2014). Another factor is the income the newly self-employed can generate

early on, which must be large enough to compensate for leaving employment and cover business costs (Rissman, 2003).

3 Data and methodology

The research focuses on the impact of selected regional factors at the time of starting self-employment on the share of supported self-employed persons in the total number of the newly self-employed across the 79 administrative districts of the Slovak Republic. We follow those self-employed, including the supported self-employed, who started self-employment in the period from 1 January 2013 to 31 December 2015. The sample is affected by the change in the duration of continuous self-employment required to remain eligible for the support, which increased from two to three years effective from 1 May 2013 (Inštitút zamestnanosti, 2024). We do not exclude those who signed onto support prior to this change, i.e., between 1 January and 30 April 2013. Only those who signed agreements in 2013-2015 and were also self-employed for 2-3 years after signing the agreement, as required by the program, were included among the supported self-employed. The payment of the new allowance for the start of self-employment was suspended in 2020. Only financial subsidies from previous years have been paid out in this period (ÚPSVaR, 2022).

Data on the total number of the self-employed, freelancers, sole traders and self-employed small farmers were obtained from the internet portal finstat.sk from 2013 to 2015 (Finstat, n. d.). Subsequently, we excluded the records that lacked a registered office address or date of incorporation or were located in another state. Where the business registration address was not available, we used the address of the place of business. For the self-employed with multiple business locations, we chose the address of the location at which the business was registered.

Then, we focused on the self-employed supported by the self-employment allowance. We used internal data from the Ministry of Labour, Social Affairs and Family of the Slovak Republic. We classified the supported persons into districts according to where they are self-employed. If the place of self-employment was not available, we used the place of residence of the self-employed person. The reason for this division is that the grant is administered by the Office of Labour, Social Affairs, and Family for the district where the supported self-employed is registered for business (Inštitút zamestnanosti,

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2024). We considered only those supported who had signed the allowance agreement in the period from 2013 to 2015. Subsequently, we excluded those self-employed who had neither a business registration address nor a permanent residence address listed. The dataset only includes those supported self-employed who signed their agreements in 2013–2015 and met the business longevity condition (i.e., were still self-employed at least through 2015/2016 to 2018, i.e. 2–3 years after signing on).

Data on the number of the supported self-employed, the total number of the self-employed, and the proportion of the supported in the total self-employed are shown in Figures 1–3. Maps were created with QGIS.

Many research projects examining self-employment or self-employment support use linear regression (Tsvetkova, Partridge & Betz, 2018), logistic regression (Pisar, Mertinková & Šipikal, 2021; Rissman, 2003), decision trees (Pisar et al., 2022), statistical comparison (Oberschachtsiek & Scioch, 2014; Wolff & Nivorozhkin, 2012), PSM (Caliendo & Künn, 2013; Duhautois, Redor & Desiage, 2015; Wolff, Nivorozhkin & Bernhard, 2015; Wolff & Nivorozhkin, 2012) or discrete-time survival analysis (Haapanen & Tervo, 2009). We chose to use linear regression, which allows us to examine the impact of the proportion of the supported self-employed on the total number of the new self-employed at the time of signing the support agreement and the start of self-employment. The relatively low number of observations (79) corresponds to the number of administrative districts in the Slovak Republic. We chose to identify the problem of multicollinearity using the variance inflation factor (VIF). Consequently, we selected those independent variables that are not significantly correlated with each other, which we included in the model. We used Wooldridge's monograph to help create a suitable linear regression model (Wooldridge, 2013). We used the Stata17 program (StataCorp, 2021).

$$se = X\beta + e$$
$$se_d = \beta_0 + \beta_1 dp_{ad} + \beta_2 ts_{ad} + \beta_3 \ln\_un_{ad} + \beta_4 \ln\_nom_{ad} + e_{ad} \quad (1)$$

We obtained data on the number of the supported self-employed and the total number of the newly self-employed in Slovakia between 2013 and 2015. We then created a dependent variable (se) representing the proportion of successful applicants for the support to start self-employment on the total number of the new self-employed at the district level (d). Data are sourced from finstat.sk

and the Ministry of Labour, Social Affairs and Family of the Slovak Republic in the 2013-2015.

$$se_d = \frac{total\ num.of\ successful\ self-employers\ supported\ in\ 2013-2015}{total\ num.of\ new\ self-employers\ in\ 2013-2015} \quad (2)$$

The independent variables were obtained from the free Datacube database of the Statistical Office of the Slovak Republic (n.d. a, b, c, d). Independent variables describe the regional economic and business environment at the district level at the time of first grant of the self-employment allowance and start of self-employment. They include the average population density (dp), average nominal wage (ln_nom), unemployment rate (ln_un), and the total number of self-employed persons (ts). The independent variables are expressed as an average of the values between 2013 and 2015 at district level (ad). Variables are measured at the start of self-employment. The average unemployment rate and average nominal wage are taken as logarithms.

Table 1: Description of independent variables

Name	Description	Minimum (without logs)	Maximum (without logs)
densityofpopul (dp)	Population density per square km	28.70	4,065.97
averagetotalselfem (ts)	Total number of the self-employed in selected economic activities (SK NACE Rev. 2) as at 31 December	557.33	12,274.33
ln_unemp (ln_un)	Natural logarithm of the percentage of registered unemployment rate expressed as a percentage to 2 decimal numbers.	4.91%	29.50%
ln_nominwage (ln_nom)	Natural logarithm of the average nominal monthly wage of employees in euros. Total wages by economic activity determined by the workplace method.	615.667	1,394.667

Source: Own elaboration of data from datacube.statistics.sk

Many studies use the same or similar variables to track self-employment,

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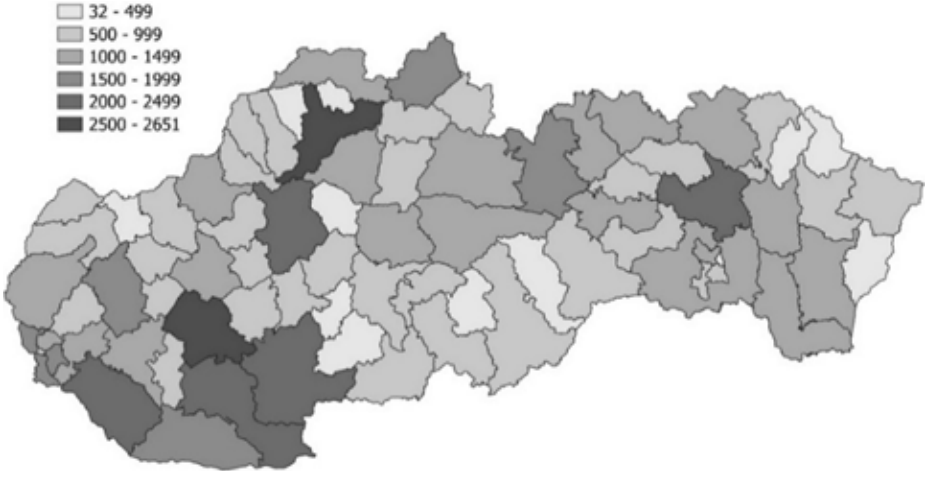
small business, or self-employment support, e.g., unemployment rates (Audretsch, Dohse & Niebuhr, 2015; Botric, 2012; Cueto, Mayor & Suárez, 2015; Faggio & Silva, 2014; Filippopoulos & Fotopoulos, 2024; Naudé et al., 2008; Tervo, 2006), population or entrepreneur income (Bashir, Gebremedhin, & Chawdhry, 2014; Caliendo & Künn, 2013; Tsvetkova, Partridge & Betz, 2018), population density (Deller, 2010; Faggio & Silva, 2014; Fotopoulos & Storey, 2017; Wyrwich, 2014).

Our sample consists of self-employment support applicants who started self-employment between 1 January 2013 and 31 December 2015, and who met the program condition to remain in business for at least 2 years (for support agreements signed up to the legislative amendment of May 2013) or 3 years (thereafter), i.e., who were still self-employed by 2015/2016 to 2018. As our independent variables are intended to capture the situation at self-employment start, we use their average values for 2013–2015.

4 Results

In this study, we focus on how the regional factors at the time of starting self-employment affect the share of the supported self-employed on the total number of the new self-employed (the dependent variable, se). Only those support recipients are included who have met the grant agreement condition to remain self-employed for at least 2-3 years from the signing of the agreement.

Figure 1: Number of all new self-employed, 2013–2015



Source: Own elaboration using QGIS (2024), base shapefile: GKÚ Bratislava (2024), with data from finstat.sk

The regional independent variables include the average population density, average number of all self-employed, logarithm of the average unemployment rate, and the logarithm of the average nominal wage, for the 2013–2015 period at LAU1 (administrative district) level.

The total number of the new self-employed in the 2013–2015 period in Slovakia was 81,511. The largest number was found in Nitra District (2,651), and the smallest in the urban Third District of Košice (32). The average number of the new self-employed per district was 1,032.3. Mostly, the new self-employed are concentrated near the regional capitals, which are generally the country's largest cities. Geographically, numbers tend higher in western Slovakia, near the capital city of Bratislava, and in the southwest (Fig. 1). The highest concentration of the new self-employed was found in the southwestern districts of Nitra, Levice, Nové Zámky, and Dunajská Streda. Districts in northeastern, south-central, and northwestern Slovakia generated fewer new self-employed.

Figure 2: Number of the supported self-employed in 2013–2015

Source: Own elaboration using QGIS (2024), base shapefile: GKÚ Bratislava (2024), data: Ministry of Labour, Social Affairs and Family of the Slovak Republic

The total number of the supported self-employed who started 2013–2015 and went on to meet the two- or three-year longevity condition of their allowance agreement was 10,057. The most were found in Prievidza District (444), and the least in Poltár District (14). The average number per district was 127.3. Higher concentrations relative to district population were seen in the northeastern districts of Kežmarok, Prešov, and Stará Ľubovňa, the southeastern districts

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of Spišská Nová Ves and Michalovce, in Martin, Námestovo, and Považská Bystrica Districts in the north, in Nitra, Nové Zámky, and Prievidza Districts in the southwest, and in Trnava and Trenčín Districts in the west (Fig. 2).

The highest proportion of the successful supported self-employed to all new

Figure 3: Supported new self-employed share on all new self-employed, 2013–2015

Source: Own elaboration using QGIS (2024), base shapefile: GKÚ Bratislava (2024), data: Ministry of Labour, Social Affairs and Family of the Slovak Republic and data from finstat.sk

self-employed who started in 2013–2015 was in the Third District of Košice (0.91). Here, 29 were supported out of 32 total. The smallest share of the supported to the total self-employed was in Skalica District (0.024), where the total number of the new self-employed was 638, of which 15 were supported. Generally, the highest shares of the supported on the total new self-employed were found in northeastern, northern, and some central districts. In western Slovakia, the highest shares were seen in Považská Bystrica and Prievidza Districts. In central Slovakia, it was Dolný Kubín, Banská Štiavnica, Detva, and Revúca Districts. In eastern Slovakia, they were primarily districts in the south of the region, namely Michalovce, Košice III, Rožňava, Sobrance, and Spišská Nová Ves, as well as Stropkov District in the northeast (Fig. 3).

Table 2: Regression results

	(1)
VARIABLES	se_d
Densityofpopul	**7.57e-05*** **
	(2.64e-05)
Averagetotalselfem	-4.94e-06
	(5.03e-06)
ln_unemp	-0.0139
	(0.0395)
ln_nominwage	**-0.328*** **
	(0.114)
Constant	**2.379*** **
	(0.817)
Observations	79
R-squared	0.198

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Source: Own elaboration, data: Ministry of Labour, Social Affairs and Family of the Slovak Republic and finstat.sk, datacube.statistics.sk in the Stata 17

In Table 2, we present the results of the linear regression. The model used is statistically significant and explains about 19.79% of the variability in the dependent variable, which is the share of support recipients on all newly self-employed. This suggests that the model captures some part of all the regional factors affecting the share of the successful supported self-employed on all self-employed at the time of self-employment entry. The population density and logarithm of nominal wage are statistically significant. Higher population density in a district has a positive effect on the share of the successful supported self-employed on all newly self-employed and is statistically significant at the 1% level. The logarithm of the average nominal wage is negatively statistically significant at the 1% level. An increase in the average nominal wage by 1% will reduce the share of supported on all new self-employed by 0.328 percentage points. Factors such as the average number of all self-employed and the unemployment rate do not seem to affect the sustainability of supported self-employment.

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5 Discussion

This study analyses the impact of selected regional factors on the share of the public supported self-employed on all new self-employed starting in 2013–2015 in Slovakia at district level.

Our dependent variable is the share of the total supported self-employed on all new self-employed across the 79 districts of the Slovak Republic in 2013–2015. The group of all newly created self-employers includes the self-employed, freelancers, sole traders and self-employed small farmers. Of the supported self-employed, only those who met the program's longevity condition (remaining in business for at least 2, later extended to 3 years) are included. The largest numbers of the new self-employed arose in districts comprising regional capitals and their environs, as well as in western Slovakia near the capital city of Bratislava. The supported self-employed are more concentrated in certain areas, specifically in central, eastern and the south of western Slovakia.

Our linear regression model is statistically significant and shows that regional factors partially influence the share of the successfully supported self-employed on the total number of the new self-employed at the district level. Two regional variables are statistically significant. The average population density in 2013–2015 had a positive effect, implying that districts with higher population density provide better conditions for the successful supported self-employed on the total number of the new self-employed. Population density was statistically significant on self-employment rates in 2011 (Fotopoulos & Storey, 2016). The unemployment rate is not statistically significant. Similar results are found in Botric (2012), where regional differences in unemployment are not significant for the self-employed. However, other authors find higher unemployment to be a significant motivator for starting self-employment (Rissman, 2003; Tervo, 2006). The logarithm of the average nominal monthly wage is negatively statistically significant. An increase of 1% in nominal wage is associated with a reduction of approximately 0.328 in the share of the successful supported self-employed in all new self-employed.

Higher population density and lower average wages in 2013-2015 have a positive effect on the share of successful supported self-employed persons in the total number of new self-employed persons. We assume these applicants

chose the support option due to the lower average income in their districts. In these districts, all support recipients met the longevity condition of their allowance agreement, suggesting that in such districts, public support may be a good incentive for starting new businesses.

6 Conclusion

The ALMP aims to return the unemployed to the labour market as quickly as possible through projects, programs and various other activities (ÚPSVaR, 2022). One of the active labour market measures focused on increasing employment is the Self-employment Allowance. In this paper, we focus on regional factors at the district level and their impact on the share of the supported self-employed in the total number of new self-employers that have met the business longevity condition of their support agreements. We look at the share of self-employed persons who received the start-up allowance and remained in business for at least 2 or 3 years on all persons starting self-employment in the same period in Slovakia. We then examine the impact of selected regional factors at the time of first allowance receipt and start of self-employment.

In the research, we created a research question: Do regional factors at the time of starting self-employment affect the share of successful public supported self-employed persons in all newly self-employed persons at the district level in Slovakia?

The main finding is that average population density and (logarithmic) average nominal wage had an impact on the share of supported self-employed on all new self-employed in 2013–2015 at the district level. The logarithmic nominal wage had a negative impact on a district's share of the supported self-employed who met the longevity condition on the total number of new self-employers. In districts with lower average nominal wage, the proportion of the supported self-employed was higher. Other regional factors analysed at the district level, such as the average total number of self-employed persons and the unemployment rate, did not affect the number of supported self-employed persons to the total number of new self-employers. The model is statistically significant and explains 19.79% of the variability in the dependent variable, suggesting that other factors may affect the result. This is a potential avenue for further research.

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Limitations include low number of independent variables and a short study period. Our source data tracks all newly self-employed, including the self-employed and freelance small farmers, and freelancers. Our research uses average values of regional indicators at the district level in Slovakia in 2013–2015. The database of all new self-employers includes those who have been self-employed for less than 2 or 3 years. However, for the supported self-employers this condition was met. Subsequent research may focus on linking the sustainability of supported self-employment to different regional, individual, and economic characteristics. Additionally, examining a longer period would help determine whether results remain robust through economic changes. In the future, our results may allow better allocation of financial resources to support self-employment at the district level.

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REFERENCES

[1] Andersen, T. M., & Svarer, M. (2012). Active labour market policies in a recession. *IZA Journal of Labor Policy, 1*(7), 1–19. https://doi.org/10.1186/2193-9004-1-7

[2] Audretsch, D. B., Dohse, D., & Niebuhr, A. (2015). Regional unemployment structure and new firm formation. *Papers in Regional Science, 94*(1), 115–138. https://doi.org/10.1111/pirs.12169

[3] Bashir, S., Gebremedhin, T., & Chawdhry, M. A. (2014). Does self-employment enhance regional economic development? *Journal of Developmental Entrepreneurship, 19*(4), 1450025. https://doi.org/10.1142/S1084946714500253

[4] Betcherman, G., Olivas, K., & Dar, A. (2004). *Impacts of active labor market programs: New evidence from evaluations with particular attention to developing and transition countries* (Social Protection Discussion Paper Series No. 0402). World Bank.

[5] Bilan, I., & Apostoaie, C. M. (2023). Unemployment benefits, entrepreneurship policies, and new business creation. *Small Business Economics, 61*(4), 1411–1436. https://doi.org/10.1007/s11187-023-00735-9

[6] Botric, V. (2012). Regional differences in self-employment: Evidence from Croatia. *Economic Research-Ekonomska Istraživanja, 25*(1), 243–266. https://doi.org/10.1080/1331677X.2012.11517564

[7] Caliendo, M., & Künn, S. (2013). Regional effect heterogeneity of start-up subsidies for the unemployed. *IZA Discussion Paper* (No. 7460), 1–40. https://doi.org/10.2139/ssrn.2287070

[8] Cueto, B., Mayor, M., & Suárez, P. (2015). Entrepreneurship and unemployment in Spain: A regional analysis. *Applied Economics Letters, 22*(15), 1230–1235. https://doi.org/10.1080/13504851.2015.1021450

[9] Deller, S. C. (2010). Spatial variations in the role of microenterprises in economic growth. *The Review of Regional Studies, 40*(1), 71–97. https://doi.org/10.52324/001c.8161

[10] Duhautois, R., Redor, D., & Desiage, L. (2015). Long-term effect of public subsidies on start-up survival and economic performance: An empirical study with French data. *Revue d'Économie Industrielle, 149,* 43–72. https://doi.org/10.4000/rei.6063

[11] Dvoulety, O., & Hora, O. (2020). Analysis of the start-up subsidy for unemployed in the Czech Republic. *Politická Ekonomie, 68*(2), 142–167. https://doi.org/10.18267/j.polek.1267

[12] Faggio, G., & Silva, O. (2014). Self-employment and entrepreneurship in urban and rural labour markets. *Journal of Urban Economics, 84,* 67–85. https://doi.org/10.1016/j.jue.2014.09.001

[13] Filippopoulos, N., & Fotopoulos, G. (2024). Employment protection and regional self-employment rates in an economic downturn: A multilevel analysis. *The Annals of Regional Science, 72*(4), 617–646. https://doi.org/10.1007/s00168-023-01214-5

[14] Fotopoulos, G., & Storey, D. J. (2017). Persistence and change in interregional differences in entrepreneurship: England and Wales, 1921–2011. *Environment and Planning A: Economy and Space, 49*(3), 670–702. https://doi.org/10.1177/0308518X16674336

[15] GKÚ Bratislava. (2024). Territorial and administrative arrangement - Basic level / ZBGIS-Administrative boundaries. *Geoportal.sk*. Available at: https://www.geoportal.sk/en/zbgis/download/

[16] Haapanen, M., & Tervo, H. (2009). Self-employment duration in urban and rural locations. *Applied Economics, 41*(19), 2449–2461. https://doi.org/10.1080/00036840802360278

[17] Huggins, R., Prokop, D., & Thompson, P. (2017). Entrepreneurship and the determinants of firm survival within regions: Human capital, growth motivation and locational conditions. *Entrepreneurship & Regional Development, 29*(3–4), 357–389. https://doi.org/10.1080/08985626.2016.1271830

[18] Inštitút zamestnanosti. (2024). *Zákon o službách zamestnanosti: Paragraf 49.* Available at: https://www.iz.sk/sk/projekty/zakon-o-sluzbach-zamestnanosti/paragraf-49#20130101

[19] Naudé, W., Gries, T., Wood, E., & Meintjies, A. (2008). Regional determinants of entrepreneurial start-ups in a developing country. *Entrepreneurship & Regional Development, 20*(2), 111–124. https://doi.org/10.1080/08985620701631498

[20] Oberschachtsiek, D., & Scioch, P. (2014). The outcome of coaching and training for self-employment: A statistical evaluation of outside assistance support programs for unemployed business founders in Germany. *Journal for Labour Market Research, 48*(1), 1–25. https://doi.org/10.1007/s12651-014-0161-6

[21] Pisar, P., Mertinková, A., & Šipikal, M. (2021). What factors influence the survival of subsidised start-ups for the unemployed in Slovakia? *Central European Public Administration Review, 19,* 109–130. https://doi.org/10.17573/cepar.2021.2.06

[22] Pisar, P., Mertinková, A., Šipikal, M., & Stachova, M. (2022). The importance of determinants of transition from unemployment to self-employment: Evidence from Slovak micro-data. *Statistika: Statistics and Economy Journal, 2,* 138. https://doi.org/10.54694/stat.2022.8

[23] QGIS. (2024). *QGIS 3.36 Maidenhead: Geographic Information System*. QGIS Association. Available at: https://www.qgis.org

[24] Rissman, E. (2003). Self-employment as an alternative to unemployment. *Federal Reserve Bank of Chicago, Working Paper Series*. https://doi.org/10.2139/ssrn.486988

[25] Simoes, N., Moreira, S., & Crespo, N. (2015). Individual determinants of self-employment entry: What do we really know? *Journal of Economic Surveys, 29*(5), 932–955. https://doi.org/10.1111/joes.12111

[26] StataCorp. (2021). *Stata statistical software: Release 17*. StataCorp LLC.

[27] Statistical Office of the Slovak Republic. (n.d. a). Datacube: Population density - SR-region-region-district. *Datacube.* Available at: https://datacube.statistics.sk/#!/view/sk/vbd_dem/om7015rr/v_om7015rr_00_00_00_sk

[28] Statistical Office of the Slovak Republic. (n.d. b). Datacube: Registered unemployment rate. *Datacube.* Available at: https://datacube.statistics.sk/#!/view/sk/VBD_SK_WIN/pr3108rr/v_pr3108rr_00_00_00_sk

[29] Statistical Office of the Slovak Republic. (n.d. c). Datacube: Self-employed persons by selected economic activities (SK NACE Rev. 2) as at 31.12. *Datacube.* Available at: https://datacube.statistics.sk/#!/view/sk/vbd_sk_win2/og3801rr/v_og3801rr_00_00_00_sk

[30] Statistical Office of the Slovak Republic. (n.d. d). Datacube: Wages by economic activity determined by the workplace method. *Datacube.* Available at: https://datacube.statistics.sk/#!/view/sk/VBD_SK_WIN/np3110rr/v_np3110rr_00_00_00_sk

[31] Tervo, H. (2006). Regional unemployment, self-employment, and family background. *Applied Economics, 38*(9), 1055–1062. https://doi.org/10.1080/00036840500400053

[32] Tsvetkova, A., Partridge, M., & Betz, M. (2018). Self-employment effects on regional growth: A bigger bang for a buck? *Small Business Economics, 52*(1), 27–45. https://doi.org/10.1007/s11187-018-9988-5

[33] ÚPSVaR. (2022). *Vyhodnotenie uplatňovania aktívnych opatrení na trhu práce za rok 2021* (Employment Services Section, pp. 114). Available at: https://www.upsvr.gov.sk/buxus/docs/SSZ/OAOTP/Vyhodnotenie_AOTP/Vyhodnotenie_AOTP_za_rok_2021.pdf

[34] Finstat (n.d.). Web portal. Available at: https://finstat.sk/

[35] Wolff, J., & Nivorozhkin, A. (2012). Start me up: The effectiveness of a self-employment programme for needy unemployed people in Germany. *Journal of Small Business & Entrepreneurship, 25*(4), 499–518. https://doi.org/10.1080/08276331.2012.10593586

[36] Wolff, J., Nivorozhkin, A., & Bernhard, S. (2015). You can go your own way! The long-term effectiveness of a self-employment programme for welfare recipients in Germany. *International Journal of Social Welfare, 25*(2), 136–148. https://doi.org/10.1111/ijsw.12176

[37] Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach* (5th ed.). South-Western.

[38] Wyrwich, M. (2014). Ready, set, go! Why are some regions entrepreneurial jump starters? *The Annals of Regional Science, 53*(2), 487–513. https://doi.org/10.1007/s00168-014-0629-x