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**Do less developed regions vote populist
political parties? The case of Slovakia**

Bachelor's thesis

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Declaration of Authorship

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Prague, May 3, 2021

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Abstract

Populism has been a widespread issue since the 20th century. Scientific work that has dealt with this political approach in the past is concentrated mainly on influential countries, whereas smaller countries do not receive much attention. Therefore, we investigate the two Slovak latest parliamentary elections taking place in 2016 and 2020 using the data on the county level. As far as one of the Slovak problems are regional disparities, this paper aims to find the key characteristics of the counties that influence the support of populist parties voting. In the first place, we introduce the OLS estimation with the heteroskedasticity standard errors, given that heteroskedasticity is detected in most of our models by the Breusch-Pagan test. We find out a positive effect of unemployment and religious people on voting for populist parties. On the contrary, skilled workers and Hungarians minorities are opposed to voting for such parties. Furthermore, we merge the dataset to create two-period panel data and apply pooled analysis and first-differencing to examine the changes over the years. However, we do not reveal any significant changes between 2016 and 2020.

Keywords populism, populist political parties, vote share, voting behaviour, Slovakia, ordinary least squares method, pooled analysis, first-differencing

Title Do less developed regions vote populist political parties? The case of Slovakia

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Abstrakt

Populizmus je rozšíreným problémom od 20-teho storočia. Vedecké práce, ktoré sa v minulosti zaoberali týmto politickým prístupom sa sústreďujú najmä na vplyvné krajiny, menším krajinám sa nevenuje dostatočná pozornosť. Z toho dôvodu skúmame posledné dve slovenské parlamentné voľby, ktoré sa uskutočnili v rokoch 2016 a 2020, pomocou údajov na úrovni okresov. Keďže jedným zo slovenských problémov sú regionálne rozdiely, cieľom tejto práce je nájsť kľúčové charakteristiky okresov, ktoré ovplyvňujú podporu hlasovania populistických strán. V prvom rade uvádzame metódu najmenších štvorcov so štandardnými chybami heteroskedasticity, a to z dôvodu, že heteroskedasticita je detekovaná vo väčšine našich modelov metódou Breusch-Pagan. Zistujeme pozitívny vplyv nezamestnanosti a veriacich na hlasovanie za populistické strany. Naopak, proti hlasovaniu za tieto strany sú kvalifikovaní pracovníci a maďarské menšiny. Následne zlúčime súbor údajov, aby sme vytvorili údaje z dvoch období a na preskúmanie zmien v priebehu rokov aplikujeme združenú analýzu a prvú diferenciu. Medzi rokmi 2016 a 2020 však nenachádzame žiadne výrazné zmeny.

Kľúčová slova	populizmus, populistické politické strany, volebný podiel, volebné správanie, Slovensko, metóda najmenších štvorcov, združená analýza, prvá diferencia
Název práce	Volia menej rozvinuté okresy populistické politické strany? Prípady Slovenska
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Acronyms

HZDS People's Party - Movement for a Democratic Slovakia

LSNS People's Party - Our Slovakia

MLR Multiple Linear Regression

OLS Ordinary Least Squares

SME Small and Medium Enterprises

SMER Smer - Social Democracy

SNS Slovak national party

VIF Variance Inflation Factor

Bachelor's Thesis Proposal

Author	Natália Dusková
Supervisor	Mgr. Barbara Pertold-Gebicka M.A. Ph.D.
Proposed topic	Do less developed regions vote populist political parties? The case of Slovakia

Research question and motivation Politicians and political parties are trying to obtain as many votes as possible, by various approaches. Their intention is to convince people to vote for their political party, for their ideas, for their motivation. One of the means how to maximize votes is relying on populism, a phenomenon that is deepening in many countries around the world. The society have been dealing with populism for many decades. Ivan Krastev (2006) in his paper describes Hugo Chavez in Venezuela as a populist leader, similarly as Vladimir Putin in Russia, even though these are different types of regimes. As Daniel Smilov and Ivan Krastev (2008) suggest, rising of populism is not an exception in Eastern European countries. As Andres Rodriguez-Pose (2018) argues in his article, in Central and Eastern Europe the economic dynamism has been heavily concentrated in capital cities, which combine size with economic and political power. What about regions with lower standards of living? In my thesis, I am going to study the relationship between the Slovak populist political parties' success and their voters' motivation in less developed regions of Slovakia. Grigorij Mesežnikov et al. (2008) explain that SMER-SD is a party of "soft", non – authoritarian populism. Another populist party in Slovakia, Kotlebovci -Ludová strana Naše Slovensko, is a party of "hard" populism, which threatens principles of liberal democracy. I will analyze the data from the Parliamentary elections from 2016 and 2020 and compare results and changes in the outcomes. I am concerned about places "that do not matter". According to McCann (2016) populists are usually more successful in territories that have been dealing with long-term declines and reflect an increasing urban/rural divide. I assume that regions with lower income, higher unemployment and lower GDP in comparison with other regions in Slovakia decided to vote for populist parties, especially for SMER – SD in elections in 2020, although the party was diminishing its popularity at the

country-level. I would like to investigate whether voters in regions with high percentage of success of SMER in the Parliamentary election in 2016 decided to vote for SMER again in the Parliamentary election in 2020. Working on this specific topic is critical, considering that rise of populism can be dangerous as Ingelhart and Norris (2016) proved in their paper, voters of populist parties prefer authoritarianism and distrust of governance. My motivation is to seek to what extent is populism widespread in Slovakia.

Contribution There are many papers analyzing voting behaviour and relationships between the demography and results of the elections. However, my work will be focused on analyzing the most recent elections, which has not been analysed yet. What is more, I will be interested in the trend and changes in support for the political parties, since I will compare the data from two elections. In my opinion, it is important to analyze the data from several elections to observe dynamics in populism and enrich the existing literature on the topic. There are significantly less papers related to political situation in the Eastern and Central Europe and Slovakia especially, therefore I have decided to do my bachelor thesis about political problems in Slovakia. I was inspired by Michal Kotrc and his bachelor thesis from 2017 about rising extremism in Slovakia. The explanation of behaviour of voters in poorer regions in Slovakia may reflect problems in „forgotten“ regions and help policy makers target their plans and ideas better.

Methodology I am going to work with county-level data from the Parliamentary elections from years 2016 and 2020 coupled with basic economic and demographic indicators. I will rely on OLS regression analysis and potentially take advantage of spatial models. The dependent variable will be the percentage of votes for populist political parties (SMER alone or extremistic parties alone, or all populist parties together – in different specifications). As explanatory variables I will use variables identifying less developed regions such as demographic structure of county populations, GDP, local wages, unemployment rate or employment rate and its inactivity rate etc. I am also interested in the trend and changes in behaviour of voters between years 2016 and 2020. In this latter analysis I will work with a first-differenced model that will identify the relationship between changes in demographic and economic situation of counties and the trend in voting behaviour.

Outline

1. Introduction
2. Political situation in Slovakia

3. Electoral system
4. Political parties
5. Demography and urbanization
6. Populism
7. Data and methodology
8. Results
9. Conclusion

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Author

Supervisor

Chapter 1

Introduction

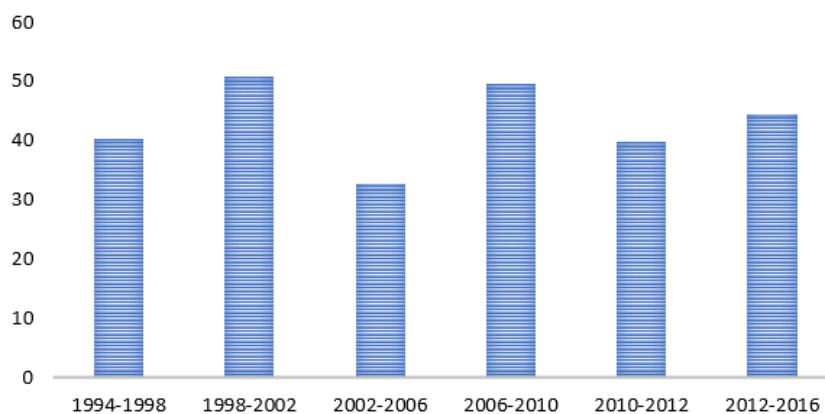
During the last decades, there has been a substantial increase in the popularity of populist political parties. We see populist leaders in Latin America, the USA, Russia and Europe. They destabilise democracy by searching for a common enemy through the polarisation of citizens, strong rhetoric and false feelings of fear and anger. Such leaders are usually very charismatic and able to speak to crowds. It is through democratic elections that they come to power and threaten the principles of democracy. Therefore, people's behaviour in the elections is scrutinised.

There happens to be a similar situation in Slovakia. Since its inception in 1993, there have been political parties with populist approaches. Slovakia is a post-communist country with almost 30 years of history. Such countries with newer democracies are more likely to have an unstable political scene with higher sensitivity to political cleavage (Ezrow et al. 2014). The figure 1.1 presents a representation of populist political parties in the Slovak scene since 1994. We display the political parties that gain at least 5% in the elections, which is the limit for becoming the parliament members. As we can see, populists have great support in Slovakia. Given that populists are very popular in Slovakia, we are curious what kind of people vote for populist political parties.

As suggested by scholars, populists are successful among people living in places with lower standards of living (Poes, 2017). Since this political topic is very relevant worldwide, extensive research has been conducted to examine the determinants of support for populist parties. Nevertheless, research considering Central and Eastern Europe is still missing. Hence, this research could contribute to a better interpretation of election results. With that in mind, we are interested in crucial characteristics eliciting great support for the

Slovak populist parties. Accordingly, Kotrč (2017) analyses the support of the right-populist political party LSNS in the parliamentary election 2016.

Figure 1.1: Share of populist parties in the parliamentary elections



This thesis aims to analyse the two latest parliamentary elections taking place in 2016 and 2020 on the county level. We intend to describe the voting results of the most recent elections that have not been analysed yet and examine the trends among the voters of populist parties and assess whether there have been any changes in the voting over the four years.¹ Once we are able to explain the voters' behaviour in less developed Slovak counties, we could demonstrate the problems of such counties. Similarly, Cerny (2019) analyses the population characteristics of voters of the parliamentary elections in the Czech republic.

The thesis is structured in the following way. Chapter 2 focuses on the relevant literature of the topic and the empirical work already done in this field. Chapter 3 is concentrated on the political and regional description of Slovakia. In the next section, Chapter 4, there is a specification of the econometric models used in the thesis. Chapter 5 presents the data collection together with introducing individual variables with their detailed description. Chapter 6 provides the estimation results, and finally, the last section - Chapter 7 concludes the findings of the thesis.

¹We initially thought about spatial analysis, but in the end we decided to focus more on changes over time.

Chapter 2

Literature review

Populism is a widespread issue in modern society. Extensive research has been conducted in this field to this day. In this chapter, we focus on the previous literature regarding populism and its popularity among voters. Subsequently, we summarise the political situation in Slovakia and describe the regional discrepancies.

2.1 Populism

According to the Cambridge Business English dictionary, populism is defined as political ideas that are expected to gain the support of ordinary people by giving them what they want. Akkerman et al. (2014) explain that populists consider people as the heart of democracy. Populists create differences based upon "us" and "them". Furthermore, people in society who are portrayed as morally correct are contrasted with the elite, which is corrupt and egoistic. The elites are usually portrayed as a large, powerful group of companies, nongovernmental institutions, ethnic minorities or immigrants, whereas populists enforce people's demands (Akkerman et al., 2014; Guiso et al., 2017; Krastev and Smilov, 2008). Additionally, the elite is the fundamental enemy of the radical right populist parties (Mudde, 2007). By creating enemies, populists can encourage people's fears and enthusiasm; voters' emotions guarantee their success.

Populism and its populist politicians are spread around the world. Krastev (2006) compares the populism of the revolutionary Hugo Chavez in Venezuela to the antirevolutionary Vladimir Putin in Russia. Hugo Chavez attacked other political parties, polarised society, and by criticising the USA, he gained domestic and foreign legitimacy. The situation is similar in Russia. Moreover, in

Russia, direct democracy is used to avoid the actual representation of the majority of Russian citizens who see themselves as defeated as a consequence of the transformation process from communism to democracy. We can find elections, political parties, or various media, although their purpose is to confirm the power, not to distribute it. These leaders share the ability to use democratic rhetoric and speak to crowds. Hawkins (2003) describes Venezuela's leader, Hugo Chavez, as a charismatic leader, one of the populist leaders' critical characteristics.

The western world is not an exception and has to deal with populism as well. As Inglehart and Norris (2016) write, Donald Trump's campaign for the presidential election in 2016 was a perfect example of populism. His rhetoric was primarily offensive to Muslims and Mexicans; he created overly suspicious conspiracy theories about his opponents or was outraged by intellectuals, liberals, incapable politicians etc.

European Union suffers from populism, too; there is an increasing part of dissatisfied Europeans, caused mainly by discontent with the EU institutions and its politics. Guiso et al. (2017) suggested that the populist politicians in EU countries exploit the fight against inequality and capital institutions to gain power. According to the last wave of the European Social Survey in 2018, there were 33 populist parties out of the 366 in Europe. The Freedom Party in Austria, the Danish People party in Denmark, The Finns party in Finland, Party for Freedom in the Netherlands, and many others threaten European democracy and its principles. Notably, the populist UK Independent party gained only one seat in the UK parliament in 2015 and still forced Conservative parties to call a referendum (Inglehart and Norris, 2016).

Remmer (2012) proves a rise of radical-left populist political parties over the past decade. Leftist populist parties fulfil people's demands by highlighting economic insecurity and technological progress, such as the automation of low-skilled jobs. On the other side, we can find rightist populist parties, described as "*a populist version of the radical right*" (Mudde, 2007). They gain support for criticising immigrants, ethnic minorities such as Jews, Muslims, Roma people, Sinti, depending on the country. Another enemy of right-populist parties is globalisation, the process of Americanization; consequently, the populists create various conspiracy theories linked to the US domination.

2.1.1 The demand side of populism

Inglehart and Norris (2016) analyse the pooled European Social Survey, providing the data for European countries from 2002-2014 regarding the economic and cultural "factors" by logistic regression. They examine models with various explanatory variables such as age, sex, unemployment, religion, living on benefits, economic inequality, person's approach to immigration etc. The analysis results indicate that populists have the most significant impact on older generations, men, less educated, belonging to ethnic majorities. Surprisingly, populists do not influence unskilled workers, but instead the "self-employed plumbers, family-owned small businesses, and mom-and-pop shop-keepers". (Inglehart, 2016)

On the other hand, unsecured layers of society such as unskilled people without proper education working in low-income jobs, people suffering from unemployment or people living in incomplete families are prone to be xenophobic, anti-institutional, an offensive against democratic movements. Rodrigues-Pose (2018) argues that people living in "places that do not matter" (such as places with a lack of opportunities, with growing economic inequality, brain drain, places with nostalgic feelings of the past) are influenced mainly by populists. Rustbelt states as Ohio, Pennsylvania, Wisconsin, Michigan in the USA helped to succeed Donald Trump in the 2016 presidential election. Nevertheless, Hillary Clinton dominated the dynamic cities in rustbelt states, such as Philadelphia, Pittsburgh, Detroit, Cleveland, Cincinnati, Madison, or Milwaukee. During the Brexit referendum, the situation in Britain was similar. Most of the biggest cities voted to remain in the EU, primarily cities that performed well in the past decades. Despite the trend, the cities like Sheffield or Birmingham voted for Brexit. In conclusion, in counties where the majority voted for Brexit, such as West and East Midlands or North East and North West England, people suffered from an industrial decline in the past years (Bloomberg, 2019). Correspondingly, North East and West Midlands have the highest share of the Brexit vote (above 58%) and lowest GDP in the UK (UK National Statistics, 2019).

2.2 Empiric work

Bruckner and Gruner (2010) examine the relationship between GDP growth and right extremist parties using panel data from 16 OECD countries. By

estimating a model that accounts for both country and time fixed effects, they find a negative and significant GDP growth effect on extremist parties' results and support. A one percentage point decrease in real GDP per capita growth results in an increase in right extremism parties' share by approximately one percentage point. Herewith authors claim that this effect should not markedly affect political results.

Černý's research (2019) focuses on the population characteristic of voters of the parliamentary election in 2017 in the Czech Republic. Dataset used in the bachelor thesis contains voting results from 6248 Czech municipalities and independent variables representing socio-economic variables such as unemployment, average age, men share, migration, population growth etc. He uses a weighted least squares model to estimate which variables affect voting behaviour and voting turnout. Afterwards, a spatial error model is chosen for the analysis as it fuses the error terms' spatial effects. The research supports the theory that radical or populist parties' gain is higher in higher unemployment regions.

Algan et al. (2017) analyse three types of data; data related to construction, agriculture, finance, government, manufacturing, trade and commerce, covering 217 regions in 25 European countries; data related to information about political parties, parliamentary and presidential elections and "*individual-level data on trust, attitudes and beliefs*" (Algan et al. 2017). Firstly, by OLS methods, they analyse unemployment in regions and vote for anti-establishment parties - separately and together. The results show a one-to-one relationship between voting for anti-establishment parties and unemployment. More importantly, unemployment is associated with voting for far-right and populist Eurosceptic parties. Secondly, by developing instrumental variables, the relationship between unemployment and populist and radical parties is examined. The results are even more potent than estimated by OLS; a rise of 1 percentage point of unemployment is linked with a 2 to 4.4 p.p. increase in voting for anti-establishment parties. Thirdly, OLS panel fixed effects estimate unemployment and its relationship with political trust, voters attitudes and their beliefs as they find out that regional unemployment is mainly correlated with a lack of satisfaction with the economy and government. More precisely, a rise of 5 p.p. in unemployment is associated with a decline of 1.5 p.p. in political trust.

Additionally, Kotrč (2017) examines the Slovak parliamentary election results in 2016 on the municipality level. By estimating the OLS method and

spatial analysis, he is focused on which sociological, economic or demographic characteristics determine the political parties' vote share. To conclude, the main findings demonstrate that the rise of four percentage points in the share of young people aged 20 to 24 causes a gain in support for LSNS by one percentage point. In the municipalities with higher Hungarian minority party losses, by an increase of 10 p.p. of Hungarians' share, there is a one percentage point decrease in the vote share for LSNS. What is more, less educated voters - with completed secondary education or lower-level preferred voting for the LSNS. Additionally, another remarkable variable is the share of unemployed people working as skilled before their job loss. If there is a two p.p. increase in skilled workers' unemployment, we can expect a gain of LSNS by one percentage point.

Following Ezrow et al. (2014), newer democracies in post-communist countries might be more sensitive to political polarisation. When the political scene is scattered, parties that choose to adopt noncentrist attitudes are advantageous to other centrist parties.

Chapter 3

The political situation in the Slovak republic

This chapter focuses on the Slovak Republic's political situation and is interested mainly in describing the Slovak populist political parties, both right and left. Afterwards, we describe the differences among Slovak regions.

3.1 Populism in Slovakia

Nationalism was a powerful characteristic of political parties in post-communist countries (Bogdanor, 1995). People in Slovakia had to deal with populism since the beginning of the Slovak Republic in 1993. According to Bútorá et al. (2008) populism can be divided into two types of populism, being "*hard populism*" and "*soft populism*".

The leading parties elected after the Velvet Revolution, People's Party - Movement for a Democratic Slovakia and Slovak national party, were considered "*hard populist*" parties or authoritarian parties. HZDS was represented in the government from 1992-2010, while during the years 1992-1998 and 2006-2010 was in the ruling coalition. During its first parliamentary elections, the party was primarily successful in villages, smaller towns, places with less-educated people, and within a higher population of Catholics. Later, in the 1998 elections, the party's electoral base remarkably narrowed to only rural areas. Their popularity was significant in the Northern and in some parts of Eastern Slovakia (Krivý, 1999). SNS was in the ruling coalition in 1994-1998 and 2006-2010. These parties' characteristic behaviour was anti-establishment rhetoric, criticism of the European Union, NATO, foreign institutions, despising Hun-

garian and Roma minorities, defending national and its blue-collar citizens, and a verbal criminalisation of political opponents (Mesežnikov, 2007). Leader of the party HZDS - Vladimír Mečiar was considered a charismatic leader and was very popular among voters; he was the only leader the party had.

Second generation populists, soft populists, were developed after joining the European Union. The second wave of populism in Slovakia was formed by Direction - Social Democracy led by Róbert Fico. Róbert Fico began his career in the Communist Party of Czechoslovakia, and after the collapse of communism, he became a member of the Party of the Democratic Left. However, his ambitions were not fulfilled. Therefore, together with the group of people close to him, Robert Fico founded Direction - Social Democracy. Firstly, the party rejected any classification, considering themselves as non-ideological. In this sense, they criticised the whole *"era before Smer"*. According to the party, the old generation of politicians could not tackle the increasing gap between the people and elites, so a new era of politicians needed to come to power (Spáč, 2012). As Smilov and Krastev (2008) explain, there is a thin line between hard and soft populism. In 2006 SMER was described as a soft-populism party, although their minority rights and foreign policy behaviour suggested their movement towards hard populism. Róbert Fico accomplishes the characteristics of a populist leader through direct rhetoric, fighting against the corrupt elites or international companies (Gyarfašová, 2008). SMER is very successful in the elections. In the first elections, in 2002, they received 13,6% and were the third most successful political party. In 2006 they won the elections with 29,14%, they also won 2010 with 34,79%. Nonetheless, they were unable to form the coalition and therefore remained in the opposition. Elections were held again in 2012, and SMER peaked with 44,4% of votes, and the party did not need a coalition partner; thus, it was able to rule alone. In 2016 the party won again; although there was a decrease in popularity, they got 28,28%. In the last election in 2020, they got 18,29%, becoming the second most popular party.

Another populist party in Slovakia, an extreme-right political party, the People's Party - Our Slovakia, was officially established in 2010. The party originated from the civic association *"Slovenská pospolitost"*, which presented itself as a movement *"of all Slovaks thinking and acting in connection with ancient Slavic and Slovak cultural, historical and spiritual traditions. We are talking about a real change, not a policy of personal enrichment or services to foreign interests! We are talking about politics for the benefit of Slovakia,*

for the benefit of every honourable and honest Slovak, no matter what the EU and the west say! We want a national revolution - just like Andrej Hlinka, we want red Slovakia to become white, Slovakia Slovak and Christian"(Slovenská pospolitost, 2008). They have been acknowledged as great critics of the EU, claiming that we are losing our sovereignty, our freedom, and they consider NATO as a terrorist organisation. EU institutions destroy our national - family, moral, Christian traditions, and Western values, immigrants and multiculturalism threaten Slovaks. The party sharply and negatively asserted towards the Romanian and Hungarian minorities. Even though LSNS accused the media of influencing public opinion, it is believed that they would have significantly lower popularity without them (Kluknavska, 2012). By the years, they got considerably higher support. In 2012, which was the first year they participated in the elections, they got 1,58%, whereas, in 2016, their result was 8,04%. In the last election in 2020, they received a 7,97% share of the votes.

3.2 Social-economic characteristics in Slovakia and its variety in regions

Slovakia has eight regions, divided into 79 counties. Regarding the quality of life, the regional disparities pose a major problem worldwide, not only in Slovakia (Olah et al., 2020). The International Monetary Fund listed Slovakia among the developed countries, although it is on its full tail in the measure of regional disparities (International Monetary Fund, 2019). The differences between rich and poor regions are deeply rooted in the country and the largest of all developed countries. It emerges from a 2019 analysis in which, among other things, the International Monetary Fund examined national, regional differences in the gross domestic product by population. In general, capital regions are the most ambitious in the country and the capital of Slovakia, Bratislava, and its region is not an exception. As reported by the Index of regional economic competitiveness from 2016 and 2019, Slovakia has a vast gap between the capital region and other regions, and Bratislava gained the significantly highest score in the regional competitiveness in Slovakia in both years. In accordance with the data of regional GDP per capita from February 2019 from Eurostat, the Bratislava region ranked in the top 10 wealthiest regions of the EU, in the 8th place (Eurostat, 2019). The figure 3.1 below provides a visual representation of regional GDP per capita in Slovakia, where we can see noticeable

differences between regions; most of Slovakia economic power is concentrated in the west of the country and particularly in the capital.

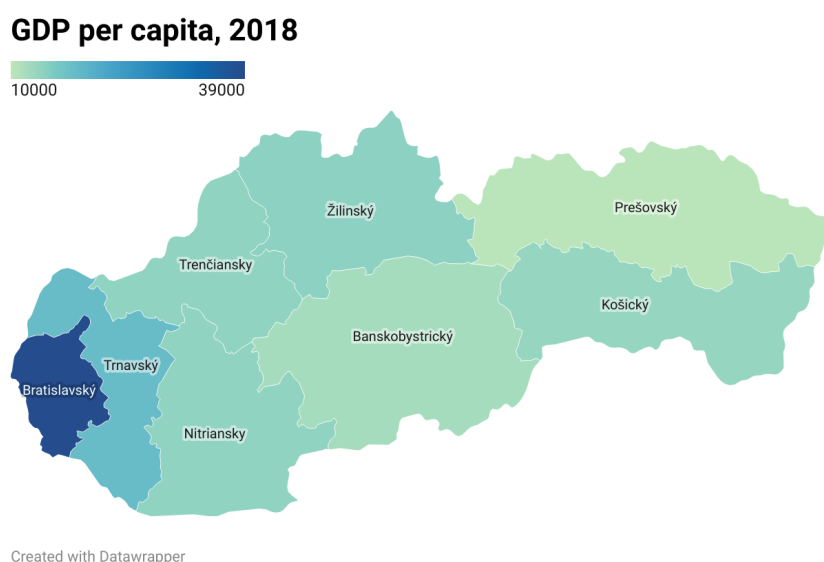


Figure 3.1: GDP visualization

Bandlerová et al. (2018) are interested in the effect of the location of small and medium enterprises in Slovakia, which are considered the "engine" of the economy. They represent 99,85% of all enterprises in Slovakia; therefore, SMEs are crucial for individual regions development. The research confirms meaningful differences between the region of the capital city and other regions. To conclude, the highest number of SMEs is located in Bratislava, considered the most ambitious Slovakia region. To identify the differences between the regions, they use the Kruskal-Wallis test by county-level, which confirms the significance of the four counties of Bratislava (Bratislava I- IV) and the rest of Slovakia. After excluding Bratislava counties, the only statistically significant counties are four counties of Košice (Košice I-IV), the second biggest city in Slovakia. By excluding these eight counties, the results show that the most attractive region for SMEs is still the Bratislava region, followed by Trnava and Trenčín region. The most unattractive regions are Banská Bystrica and Košice (by excluding four dominant counties Košice I-IV).

The paper of Oláh et al. (2020) aims to calculate the Quality of Life Index in the regions during the years 2008 - 2018 and compare the results to analyse

potential differences among them. Indicators used for calculating the Index are various, there are macroeconomic attributes as GDP per resident, unemployment rate, the average purchase price of flat, social-economic characteristics as a number of divorces per 1000 marriages, average age-old pension, number of deaths per 1000 inhabitants and attributes related to living conditions as number of crimes, fires per 1000 inhabitants and length of highways and first-class motorways and roads. In the figure 3.2 below, we can see the results of the calculated index.²

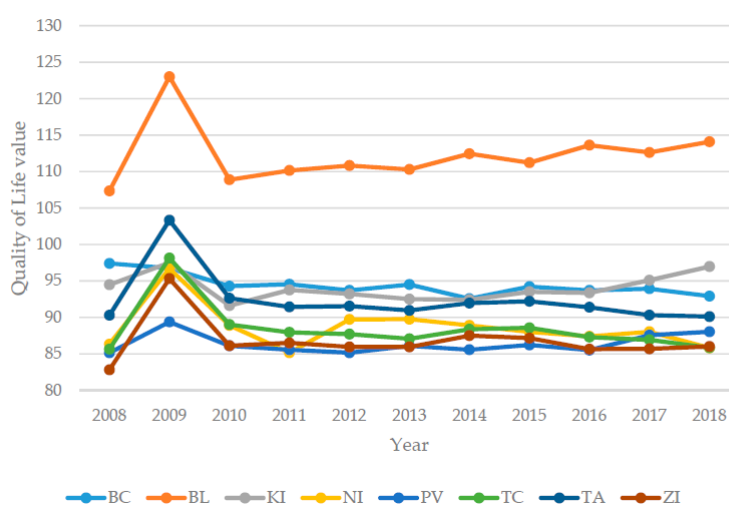


Figure 3.2: Quality of Life Index

Source: Oláh et al. (2020) Index

The significant decrease in 2009 is evident in all Slovak regions due to the economic crisis, which mainly influenced economic indicators. Additionally, scholars do the Bonferroni t-test to examine which regions are significantly different from others. Correspondingly, the boxplot 3.3 depicts the results.

It is evident from both visualisations that the Bratislava region is better off than the other Slovak regions. Bratislava is the only one that is statistically significantly different from other regions. Also, we can see that Košice and Banská Bystrica regions have higher quality of life than Nitra, Prešov, Trnava, Trenčín and Žilina regions. As we can see, regional differences have been per-

²BC - Banská Bystrica region; BL - Bratislava region; KI - Košice region; NI - Nitra region; PV - Prešov region; TC - Trenčín region; TA - Trnava region; ZI - Žilina region

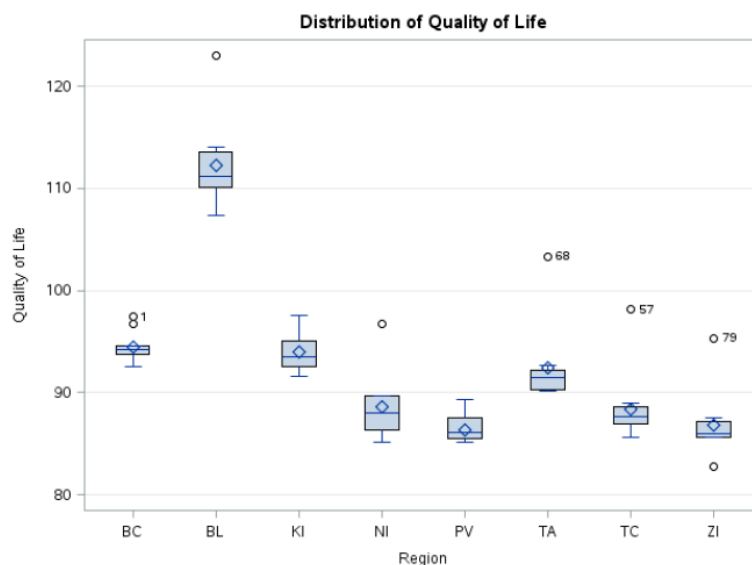


Figure 3.3: Distribution of Quality of Life

Source: Oláh et al. (2020) Index

ceived for a long time. Klamár (2008) concludes that the Bratislava region is the most developed one and Western Slovakia is the dominant part of Slovakia. Contrarily, east Slovakia and primarily the Prešov region stagnate, and the disparities are deepening. What is more, Klamár predicts the strengthening of the differences due to inefficient politics. Furthermore, Messner and Zavadil (2014) from the National Bank of Slovakia analyses the data from the 2011 census to determine the regional discrepancies in the wealth of Slovak households. The findings indicate that households in Prešov and Banská Bystrica have the most minor gathered assets, whereas, in Prešov, there is the lowest mean household income, and in the Banská Bystrica region there are the poorest households. On the contrary, the Bratislava region is the wealthiest.

3.3 The research question

The previous work clarifies that populism is also concerning Slovakia, and populist parties play an essential role in the political scene of this country. This research aims to analyse the Slovak parliamentary elections in the years 2016 and 2020 and their results. We are interested in the factors that determine the popularity of populist political parties in Slovakia. As was highlighted in the previous chapter, there are vast regional differences, and we would like to find

out which characteristics of regions are driving support of populism in Slovakia. Therefore, we present a set of variables and examine which of them influence the support of populist political parties in Slovak parliamentary elections. Our interest is to observe the trend and changes by exploring the dynamics of the support of such parties in Slovakia. As we are familiar with the question of our interest, we can focus on the ways we estimate it.

Chapter 4

Methodology

The relationship between the regional characteristics and support of populist parties can be examined using established econometric models. This section describes the econometric part of the thesis and explains how we test our research question. We justify the selected methodology approach. Firstly, we outline the empirical approach and choose an appropriate model for analysing elections in 2016 and 2020 separately. Secondly, we pool the dataset together and test the differences between the years 2016 and 2020. Our analyses are performed in the R software.

4.1 Empirical approach

Our approach is to estimate the relationship between the shares of votes given to populist parties and regional characteristics that we find relevant based on the literature review and attributes that might influence the support of populist political parties.

Our baseline model looks as follows:

$$pop_share_{i,t} = \beta_0 + E_{i,t-1}\sigma + D_{i,t-1}\gamma + u_{i,t}$$

where $pop_share_{i,t}$ is the share of votes given to populist parties (SMER, LSNS) in county i in year t elections ($t=2016$ and $t=2020$), $E_{i,t-1}$ is a vector of variables measuring economic situation in county i in year $t - 1$, $D_{i,t-1}$ is a vector of variables measuring demographic characteristics of county i in year $t - 1$, and $u_{i,t}$ is the unobservable error. Our independent variables correspond to the year preceding the election since the analysed elections took part at the beginning of the year. The variables measuring economic situation are

unemployment rate, average regional wage, job structure of the population, and the variables measuring demographic characteristics include age structure of the population, ethnicity structure, and religiosity. Both elections took place at the beginning of the year, and therefore for the 2020 elections, we analyse statistics for 2019 and for the 2016 elections, we analyse statistics for 2015. In the first place, we estimate the ordinary least squares model for each election and each party separately.

4.2 OLS regression

In order to explore the relationship between variables, the estimation will be performed by the OLS method. We choose this method since it estimates the linear regression model's coefficients. Moreover, the individual variables' coefficients can be compared and interpreted easily and straightforwardly. To produce consistent results, the Multiple Linear Regression assumptions need to be satisfied.

- MLR. 1 - Linearity in parameters:

The model is as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + u$$

where $\beta_0, \beta_1, \dots, \beta_k$ are the unknown parameters and u is the disturbance term.

- MLR. 2 - Random sampling

We have a randomly drawn sample of n observations, $(x_{i1}, x_{i2}, \dots, x_{ik}, y)$: $i = 1, 2, \dots, n$, that follows the model from MLR. 1.

- MLR. 3 - No perfect collinearity

In the sample, any of the independent variables are constant and there is no exact relationship between the independent variables.

- MLR. 4 - Zero conditional mean

The essential is to have a zero correlation between the error term and explanatory variables.

$$E(u/x_1, x_2, \dots, x_k) = 0$$

- MLR. 5 - Homoskedasticity

The error term has the exact variance given any value of the independent variables.

$$\text{Var}(u/x_1, x_2, \dots, x_k) = \sigma^2$$

Under the MLR1 - MLR 4, OLS is unbiased and consistent, and if MLR. 5 (MLR. 1 - MLR. 5 assumptions are known as Gauss Markov assumptions) is satisfied as well, the OLS is the best linear unbiased estimator, and estimates are efficient (Wooldridge, 2009). We expect the assumptions to be fulfilled; all of our parameters are linear, we observe the whole population of Slovak counties, and by maximising the number of independent variables, we eliminate the correlation between the error term and independent variables. The main issue to our models might be the possible presence of endogeneity, heteroskedasticity or/and multicollinearity. In case we do not have satisfied MLR. 4 - Zero conditional mean, we deal with endogeneity. Given that fact we apply first-differencing model, more specified later. We apply the Variance inflation factor method to test multicollinearity. Afterwards, we focus on detecting heteroskedasticity. If MLR 5 is violated, variance changes with any of the independent variables, and heteroskedasticity causes our standard errors to be invalid. However, it does not affect unbiasedness or consistency and coefficients of determination R^2 are unaffected. To test whether our model suffers from heteroskedasticity, we examine by Breusch-Pagan test. The test is performed with the null hypothesis of homoskedastic errors (Breusch and Pagan, 1979). If the null hypothesis is rejected at the p-value < 0.05 , implying the presence of heteroskedasticity, we utilise heteroskedasticity-robust standard errors (Wooldridge, 2009). If we detect the heteroskedasticity, our valid estimator of $\text{Var}(\hat{\beta}_j)$ is

$$\text{Var}(\hat{\beta}_j) = \frac{\sum_{i=1}^n r_{ij}^2 \hat{u}_i^2}{SSR_j^2}$$

Where r is the i th residual from regressing x on all other independent variables, u have squared OLS residuals and SSR_j is the sum of squared residuals from the regression. The square root of the quantity $\text{Var}(\hat{\beta}_j)$ is called the heteroskedasticity-robust standard error for β_j (White, 1980; Wooldridge, 2009).

4.3 Pooled analysis

Once we analyse the elections separately, we can turn to the two-period panel data analysis. We have the same set of counties that are observed each year. As we are interested in whether any variable has changed its influence on election results, we pool two data sets collected in 2016 and 2020 into one to determine how the population changed over time. By combining two years, we increase our sample size, which allows us to obtain more accurate results. Hence, we pool datasets for 2016 and 2020 and run the regression together.

Additionally, we interact a year dummy variable with the explanatory variables to see if the specific variable's effect experienced some changes by 2016 and 2020. The time-invariant unobserved effect a_i might be correlated with the independent variables, even though there should be no correlation between the residual and error term. This effect is used to identify unobserved time-constant elements that influence the dependent variable (Wooldridge, 2009).

The final model for a pooled model with interactions between variables and time dummy with 2020 is as follows:

$$\begin{aligned} pop_share_{i,t} = & \beta_0 + \sigma_0 y_{2020} + E_{i,t-1} \beta + y_{2020} E_{i,t-1} \sigma \\ & + D_{i,t-1} \beta + y_{2020} D_{i,t-1} \sigma + a_i + u_{i,t} \end{aligned} \quad (4.1)$$

where $pop_share_{i,t}$ is the share of votes given to populist parties in county i in year t elections ($t = 2016$ and $t = 2020$), y_{2020} is a dummy variable equal to one if the observation comes from 2020 and zero if it comes from 2016, a_i is an unobserved effect and $u_{i,t}$ is the time-varying error. β_0 is the intercept for 2016, and $\beta_0 + \sigma_0$ is the intercept for 2020. The effect of the economic variables in 2016 is β and the effect of such variables in 2020 is $\beta + \sigma$. By measuring, we clarify how the variable changed over the years.

4.4 First differencing

Some of the variables in the models used above might be endogenous, meaning that some unobservable counties' characteristics correlate not only with the dependent variable but also with the explanatory variables. For that reason, we turn to panel data methods - first differencing. The main advantage of using the first-differencing model for data analysis is that it allows us to have the time-invariant unobserved effect a_i correlated with other explanatory

variables. First-differencing is the most valuable when the time-constants are the unobserved effects that are responsible for endogeneity. We use election results from two consecutive elections and explanatory variables characterising regional economy and population from the years preceding these elections. Panel data might help to solve the endogeneity problem, as we explain below. We have two years as

$$y_{i2} = (\beta_0 + \delta_0) + \beta_1 x_{i2} + a_i + u_{i2} \quad (t = 2)$$

$$y_{i1} = \beta_0 + \beta_1 x_{i1} + a_i + u_{i1} \quad (t = 1)$$

By subtraction of the first-period equation from the second-period equation the time-invariant unobserved effect a_i is differenced away and the first differencing equation for two periods has the following form:

$$\Delta y_i = \delta_0 + \beta_1 \Delta x_i + \Delta u_i$$

where δ_0 denotes the difference between intercepts, Δx_i stands for the change between two periods from $t = 1$ to $t = 2$, and u_i is the error term, which is uncorrelated with the changes in the independent variables.

Our first-difference equation is formulated as:

$$\Delta \text{pop_share}_i = \beta_0 + \Delta E_i \sigma + \Delta D_i \gamma + \Delta u_i$$

where $\text{pop_share}_{i,t}$ the share of votes given to populist parties in county i and Δ represent differencing across the two years - 2016 and 2020.

When differencing the variables for the two years, the coefficients correspond to the change in the voting preferences, which is related to the change in the economic/demographic characteristics of the population. We are interested in how the voting share relates to change in some of the explanatory variables.

To conclude the methodology part, we test various models to detect voters' behaviour and examine the voters' changes and trends. Once we have covered the ways of estimation, we can focus on the data description.

Chapter 5

Data

Various government institutions gather socio-economic and demographic data for informative and statistical purposes, hence providing good sources for this work. This chapter aims to describe the data as we use them to estimate the models listed in the methodology section. We start by describing the explained and explanatory variables and the size of the data sample. We get acquainted with descriptive statistics for the resulting data samples. Afterwards, we focus on the correlation between the variables and add the differences in the variables between the examined years.

All of the data are publicly available on the Statistical Office of the Slovak Republic, Ministry of Interior of the Slovak Republic and Ministry of Labour, Social Affairs and Family of the Slovak Republic and the Atlas of Roma Communities.

In Slovakia, there are 79 counties, and there is no need to exclude any of the counties as we have complete data for all of them; therefore, we can consider our dataset representative. All of our independent variables are available on the county level. However, we encounter a limitation - some of the data are not collected every single year.

5.1 Data characteristics

5.1.1 Dependent variables

Our dependent variable is the vote share given to two selected populist political parties in the parliamentary elections in March 2016 and February 2020. There are two populist political parties we work with SMER - Sociálna Demokracia and LSNS - Ľudová strana Naše Slovensko. Even though there are more such

parties in Slovakia, we choose SMER since this leftist party has been on the political scene for a very long time with significant popularity among voters. We choose LSNS because it is on the opposite side of the political spectrum compared to SMER and it has gained high popularity in the last two elections. The vote share given to these parties is analysed separately, then we merge their votes and analyse them together; for both of the years - 2016 and 2020. The tables 5.1, 5.2 provide the summary of the vote share of the political parties.

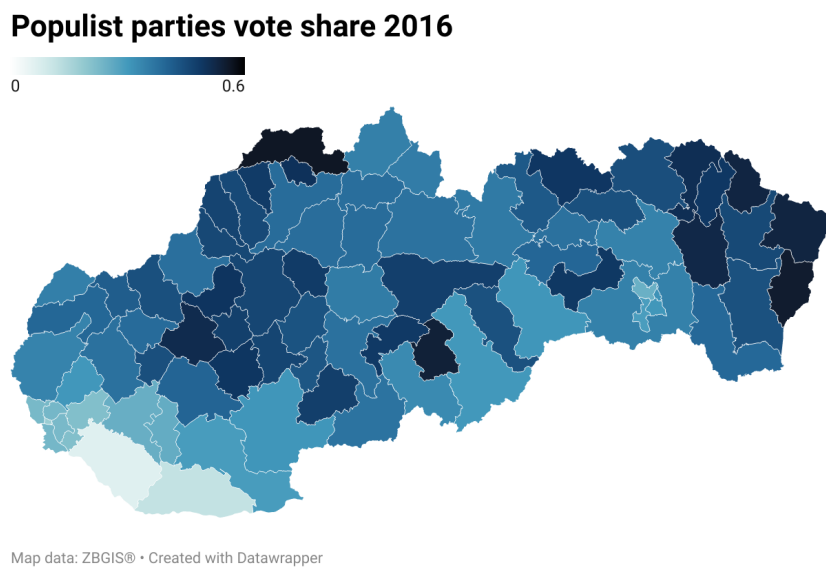
Table 5.1: Election 2016 - results of SMER and LSNS

<i>2016</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>	<i>Mean</i>	<i>St.Dev</i>
LSNS	1.29	8.79	15.35	8.64	2.7
SMER	5.17	30.27	47.18	30.32	8.67

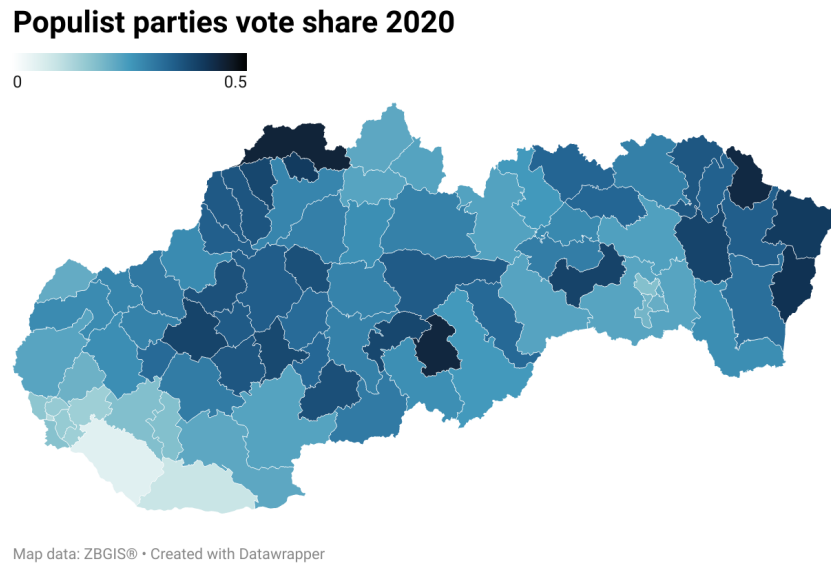
Table 5.2: Election 2020 - results of SMER and LSNS

<i>2020</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>	<i>Mean</i>	<i>St.Dev</i>
LSNS	1.42	8.85	17.04	8.78	3.02
SMER	3.93	19.9	34.23	19.76	6.23

The maps display distribution of the vote share; we use Datawrapper.³



³Datawrapper: <https://app.datawrapper.de/>



From the graphic display above, we can see that the populist parties received significantly fewer votes in southern Slovakia, which is expected due to the Hungarian ethnic minorities living there. Populist political parties gain political support mainly in the northern and eastern part of Slovakia, where the unemployment rate is higher, the wages are lower, and the national sentiment is stronger than in the rest of Slovakia. The tables below 5.3, 5.4 show the top 3 counties with the highest vote share of populist political parties and their location.

Table 5.3: The 3 top counties with the highest vote share of populist parties in 2016

<i>county</i>	<i>populistparties</i>	<i>location</i>
Čadca	56.36	Žilina region
Sobrance	55.12	Košice region
Poltár	54.09	Banská Bystrica region

Table 5.4: The 3 top counties with the highest vote share of populist parties in 2020

<i>county</i>	<i>populistparties</i>	<i>location</i>
Čadca	44.61	Žilina region
Poltáre	44.02	Banská Bystrica region
Medzilaborce	43.62	Prešov region

5.1.2 Independent variables

We can divide our independent variables into two groups: economic and demographic variables. The tables 5.5, 5.6 provide descriptive statistics of the variables. The detailed explanation of variables is available in the Appendix A.

Table 5.5: Descriptive statistics of variables collected yearly

<i>Statistics</i>	<i>2016_mean</i>	<i>2016_std.dev</i>	<i>2020_mean</i>	<i>2020_std.dev</i>
unemployment	14.07	6.59	6.62	4.22
average wage	913.27	191.55	1138.48	193.4
average age	40.16	2.06	41.15	2.1
productive	70.21	1.71	67.68	1.46
preproductive	15.25	2.43	15.62	2.44
unskilled workers	7.34	2.47	7.41	2.75
skilled workers	33.35	7.38	31.11	7.63

Table 5.6: Descriptive statistics of variables not collected yearly

<i>Statistics</i>	<i>Mean</i>	<i>Std.dev</i>	<i>Year</i>
religious	76.84	9.89	2011
Roman catholic	60.81	16.92	2011
Hungarian	6.24	13.96	2011
non Slovak	10.75	15.00	2011
Roma	5.58	6.85	2018

The table 5.5 contains the two columns for 2016 and two columns for 2020, describing the mean and standard deviation, meanwhile, the second table 5.6 shows the mean, the standard deviation and the respective year.

Economic explanatory variables

We have two variables among the economic explanatory variables. Both of these variables are collected yearly; therefore, they are crucial for our analysis.

According to the previous studies, one of the most critical factors that might affect the voting for populist parties is unemployment. The unemployment used in our analysis is adjusted for the "*Education and preparation for the labour market*", "*Temporary incapacity for work and care of a family member*", and "*Graduate practice*".

Our following variable is the average wage adjusted for inflation. We expect that the people who have lower income are more likely to vote for populist political parties.

Demographic explanatory variables

We choose the county population's average age; more precisely, we also have a share of productive population and pre-productive population. We assume that older people have a positive effect on voting for populist political parties. Even though there is an assumption that older people do not vote for right extremist political parties, they might vote for leftist populist political parties.

Regarding the job structure, we have two variables - the share of skilled workers and unskilled workers. According to ISCO 08 structure, workers can be split into three skill levels - skilled, semiskilled and unskilled. Semiskilled workers are used as a control variable to prevent perfect collinearity. We use only unskilled and skilled workers in the analysis. We predict that skilled workers will have a negative effect on voting, and on the other hand, unskilled workers will have a positive effect. All of these variables are collected yearly.

One of our variables - Roma settlement shares is not collected yearly; the latest data are from 2018. We do not expect significant changes in this variable; therefore, we use this variable for both the electoral years.

Afterwards, we have decided to choose some variables from the 2011 census. As it was ten years ago, we pick only those that we suppose have not changed significantly during these years.

We use variables regarding religion - religious and especially the group of Roman Catholics. We select the Roman Catholics as it is the most conservative and the most widespread religion in Slovakia. We expect that the proportion of religious people significantly affects the populist political parties' vote share.

We presume the counties with higher populations of non-Slovak minorities

negatively affect the populist political parties vote share, mainly the voting for the extreme-right political party LSNS - Naše Slovensko. Therefore, we include variables such as non-Slovak and separately Hungarian share of the population. We choose Hungarian and Roma people as they are the most considerable Slovak minorities.

The table below summarises the variables and expected effect - positive (+) negative (-). In the case where the expected effect is unknown, we present a question mark (?).

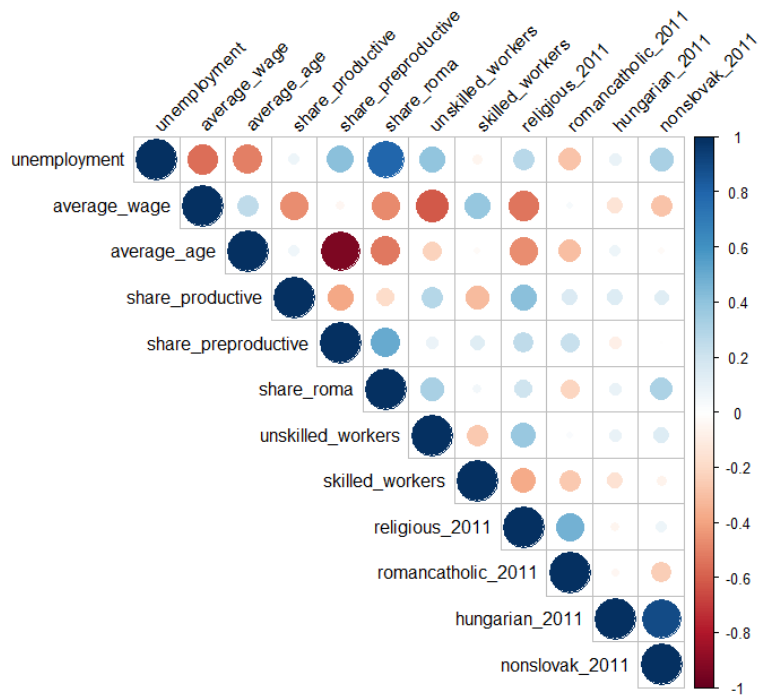
Table 5.7: Expected effect of variables

<i>Variables</i>	<i>Effect</i>
unemployment	+
average_wage	-
average_age	+
productive	?
preproductive	?
unskilled_workers	+
skilled_workers	-
roma_2018	-
religious_2011	+
romancatholic_2011	+
hungarian_2011	-
nonslovak_2011	-

5.1.3 Correlation between variables

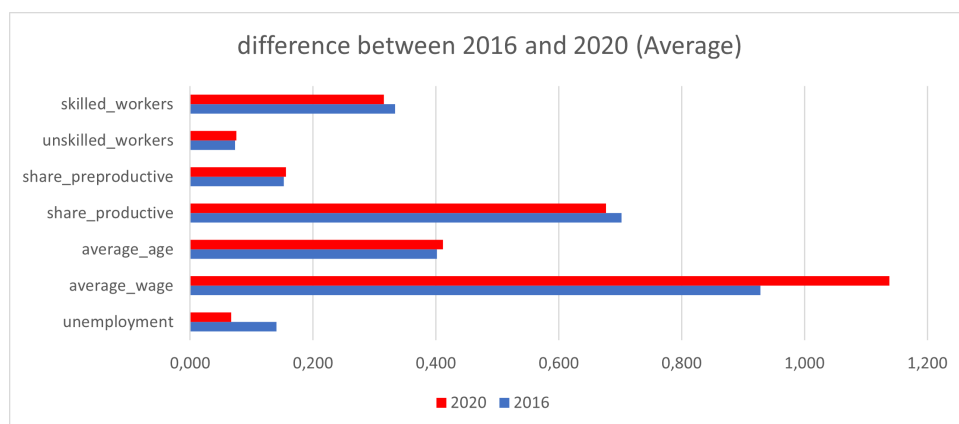
In the final dataset, there are 12 variables. The positive correlations are displayed in blue and negative correlations are displayed in red colour in the correlation matrices 5.1, 5.2 below. The size and the saturation of the circle correspond to the correlation coefficients. The legend colour on the right side of the correlogram displays the coefficient of correlation and its colours. According to the correlation matrix, there is a correlation between some variables. Variables with a correlation over >0.8 and <-0.8 will not be included in a single model, given that in such correlation, it is necessary to think about whether it does not affect results. We can see a high negative correlation between average age and share of the population in pre-productive age. There is a high positive correlation between Hungarian and non-Slovak. Given this fact, these

Figure 5.2: Correlation matrix 2020



We are also interested in the population change over the four years and its influence on the parliamentary election results in 2016 and 2020. For clarification, we include the figure 5.3 summarising differences in individual variables over the years.

Figure 5.3: Differences



Chapter 6

Empirical results

This chapter presents the estimated results of regressions of econometric models described in the former section. Additionally, we introduce appropriate tests used to determine the validation of the data in the models. For the interpretation, we use the usual levels of significance - 1%, 5% and 10%.

6.1 Appropriate tests

6.1.1 Testing for multicollinearity

As we mentioned in the previous section, there is a high correlation between the average age and the share of pre-productive people, as well as there is a high correlation between the share of Hungarians and the share of non-Slovak population. In order to secure that correlation is not causing misinterpretation of models and that our model does not suffer from multicollinearity, we use the variance inflation factor method. This method provides an index that measures how the variance in the coefficients raises because of collinearity. The VIF values exceeding 5 or 10 can indicate multicollinearity and should be excluded from the model as these results can compromise the model accuracy. By testing variables with high correlation, the VIF values of age and ethnicity structure are remarkably higher than the recommended values; therefore, we remove variables from both groups.

The VIF values of the variables are provided in the table in the Appendix C. Even though the average age is an essential variable, we use a productive and pre-productive share instead. These variables together examine the same thing as the average age. Similarly, we exclude one of the variables regarding the ethnicity structure. We remove non-Slovak since Hungarians are the biggest Slovak

minority group, and we are interested in the voting of this group. Additionally, we have a share of the Roma population in the dataset, the second-largest minority group. Afterwards, we can conclude that by eliminating the problematic variables, multicollinearity is absent in our models and assumptions MLR. 1 - MLR. 4 are satisfied.

6.1.2 Testing for heteroskedasticity

Another issue that could cause our model problems is the violation of MLR. 5; detecting heteroskedasticity. By performing the Breusch-Pagan test, in most of our models, the p-value of the BP test is very low, and we cannot reject the null hypothesis of homogeneity of the variance of the residuals. To correct our model, we use the heteroskedasticity robust standard errors (Wooldridge, 2009).

6.2 OLS Estimation

6.2.1 Final models

When modelling support for vote share of populist parties, the following regression equations are regarded:

$$\begin{aligned} pop_share_{i,t} = & \beta_0 + \beta_1 unemployment + \beta_2 average_wage + \beta_3 productive \\ & + \beta_4 preproductive + \beta_5 skilled + \beta_6 unskilled + u_{i,t} \end{aligned} \quad (6.1)$$

$$\begin{aligned} pop_share_{i,t} = & \beta_0 + \beta_1 unemployment + \beta_2 average_wage + \beta_3 productive \\ & + \beta_4 preproductive + \beta_5 skilled + \beta_6 unskilled + \beta_7 roma \\ & + \beta_8 religious + \beta_9 romancath + \beta_{10} hungarian + u_{i,t} \end{aligned} \quad (6.2)$$

where *pop_share* represents vote share given to LSNS and SMER, and *t* is the year of the election; 2016 and 2020. We are already familiar with the explanatory variables used in the models.

6.2.2 OLS results for 2016

Estimated results for OLS regression of 2016 elections is displayed in the Table 6.1 for SMER and LSNS. In the first two columns, there are results with SMER as the dependent variable. Model 1 in the first column presents the results for the model with variables collected yearly, and in the second column, Model 2, we present the results for the extended model with all of our variables. Similarly, there are two models for LSNS. The models display robust standard errors. Additionally, we display whether the variables are statistically significant. The model where we merge parties into the one, being populist political parties vote share, can be found in the Appendix D.

To judge the performance of the model, we inspect the coefficient of determination R^2 and F statistic. The null hypothesis of joint significance of the variables can be rejected; therefore, the overall significance measured by the F statistic of the regression is satisfied for all models. The R^2 informs how well our independent variables explain the dependent variable. We can see that our extended models have remarkably higher R^2 as we have added additional variables that describe the vote share better. The R^2 reaches 29%, 28% for baseline SMER and LSNS models and 87%, 76% for extended models. Our models are performed on 79 observations, as there are 79 counties in Slovakia.

Looking at the results of regression, we are interested in the statistically significant coefficients. We see differences in the significance of the variables between the models. Additionally, we notice differences in the population's voting behaviour between SMER and LSNS. In the first place, we analyse the party SMER and its differences between model 1 and model 2. The estimates for some variables changed remarkably; average wage shows in Model 1 a negative correlation with voting for SMER, whereas in model 2, the variable lost significance. Similar behaviour is revealed with the variable unskilled workers, which changed from insignificant and negative to positive and significant. These results suggest there is omitted variable bias in Model 1 and by adding additional variables such as religiosity and nationality we solve the problem. One could argue that religious people cause these changes since usually, such people are older with lower wages. When interpreting these models, we refer to Model 2 as there are added variables, and the model has a higher R^2 . Estimates of coefficients presented in Table 6.1 can be interpreted as the effect of a single explanatory variable on the share of votes while keeping other variables constant.

Table 6.1: Determinants of vote share given to SMER and LSNS in 2016

	<i>OLS</i>			
	<i>Dependent variable:</i>			
	<i>SMER_voteshare</i>	<i>LSNS_voteshare</i>	<i>SMER_voteshare</i>	<i>LSNS_voteshare</i>
	(1)	(2)	(3)	(4)
unemployment	0.225 (0.216)	0.343*** (0.079)	0.087 (0.062)	0.231*** (0.044)
average_wage	-0.018** (0.007)	0.002 (0.003)	-0.003 (0.002)	-0.004*** (0.002)
share_productive	-0.670 (0.504)	0.117 (0.237)	0.092 (0.154)	0.074 (0.112)
share_preproductive	-0.909** (0.421)	-1.692*** (0.193)	0.114 (0.137)	-0.130 (0.097)
unskilled_workers	-0.300 (0.513)	0.343* (0.190)	-0.028 (0.123)	-0.020 (0.066)
skilled_workers	-0.298*** (0.107)	-0.298*** (0.059)	-0.083** (0.033)	-0.056** (0.025)
share_roma		0.251*** (0.082)		0.005 (0.034)
religious_2011		0.436*** (0.056)		-0.088*** (0.026)
romancatholic_2011		-0.105*** (0.031)		0.082*** (0.013)
hungarian_2011		-0.426*** (0.021)		-0.121*** (0.009)
Constant	116.971*** (40.790)	22.587 (21.644)	5.152 (12.705)	10.836 (9.664)
Observations	79	79	79	79
R ²	0.29	0.87	0.27	0.71
Adj R ²	0.24	0.85	0.22	0.71
F Stat	4.98***	46.79***	4.58***	19.69***

Note:

*p<0.1; **p<0.05; ***p<0.01
robust standard errors in parenthesis

In the regression of vote share given to SMER, we can see that all variables except average wage and share productive are statistically significant on the 1% level. As expected, the unemployment rate has a positive sign. If we increase the unemployed share by 3 percentage points, we can expect a 1 p.p. gain on voting for SMER. Share Roma has a positive sign too, which one could argue that they do not vote. Another explanation can be that people living in the same neighbourhood with the Roma minority are influenced by the aggressive rhetoric of populist political parties and choose to support such parties. Increasing the share of Roma in the county by 4 p.p., there is 1 p.p. higher support of the SMER. When it comes to the population's religious share, we can see that the whole group is positively significant for voting SMER; however, Roman Catholics are significant in the opposite way. The results say that if the share of religious people increases by 2 p.p., we see an increase of 1 p.p., whereas a 10 p.p. increase of Roman Catholics cause a 1 p.p. decrease in support of SMER. Not surprisingly, Hungarian's share has a remarkably negative sign in voting for SMER. Additionally, in line with our prediction, it is evident that skilled workers have a negative impact on the support for SMER, while skilled workers have a positive one.

When it comes to analysing variables controlling the vote share of LSNS, we see differences in the significance of variables between Model 3 and Model 4. Unemployment and average wage were insignificant, whereas in the extended Model 4, we explore significance on 1% level. We identify the same voting behaviour regarding the unemployment rate, share of skilled workers and share of Hungarians as the SMER has. On the other hand, we observe the positive sign of the Roman Catholic and negative sign of religious as a whole group, which is the exact opposite of the SMER's voters behaviour. Furthermore, as was expected, there is a negative sign of average wage.

The model with populist parties together predicts the same results as we have already seen by describing SMER. We assume that SMER has higher political gains than LSNS and influences the populist parties to vote share highly. The detailed description of the model is available in the Appendix D.

6.2.3 OLS results for 2020

The OLS regression results of the 2020 parliamentary elections are displayed in Table 6.2. for SMER and LSNS. In the models for examining the election result for 2020, we have the same distribution of variables as in the models for

Table 6.2: Determinants of vote share given to SMER and LSNS in 2020

	<i>OLS</i>			
	<i>Dependent variable:</i>			
	<i>SMER_voteshare</i>		<i>LSNS_voteshare</i>	
	(1)	(2)	(3)	(4)
unemployment	0.435* (0.235)	0.377** (0.159)	0.210** (0.091)	0.422*** (0.091)
average_wage	-0.006 (0.005)	-0.001 (0.003)	-0.001 (0.002)	-0.003 (0.002)
share_productive	0.320 (0.534)	0.211 (0.350)	0.011 (0.257)	-0.062 (0.201)
share_preproductive	-0.870*** (0.271)	-1.369*** (0.209)	-0.095 (0.139)	-0.485*** (0.120)
unskilled_workers	-0.079 (0.264)	-0.084 (0.158)	0.166 (0.133)	0.142 (0.091)
skilled_workers	-0.155* (0.089)	-0.191*** (0.058)	-0.134*** (0.042)	-0.119*** (0.033)
share_roma		0.153 (0.096)		0.056 (0.055)
religious_2011		0.245*** (0.052)		-0.083*** (0.030)
romancatholic_2011		-0.040 (0.029)		0.104*** (0.016)
hungarian_2011		-0.281*** (0.025)		-0.118*** (0.014)
Constant	21.243 (40.643)	16.227 (25.232)	12.550 (19.420)	23.728 (14.487)
Observations	79	79	79	79
R ²	0.32	0.81	0.33	0.74
Adjusted R ²	0.26	0.79	0.27	0.70
F Statistic	5.583***	29.758***	5.765***	19.223***

Note: *p<0.1; **p<0.05; ***p<0.01
robust standard errors are model 1,3; OLS standard errors are model 2,4

2016, due to better data analysis and compactness of results. The F statistic measuring the overall significance is accomplished for all the models. Model 2 and Model 4 are heteroskedastic; however, Model 1 and Model 3 display OLS standard errors. We observe results being slightly different than in the results for 2016. What is necessary to mention, SMER obtained 10 p.p. fewer votes in 2020 compared to 2016, while LSNS had long-lasting results over the years. By comparing Model 1 and Model 2, we see variables did not change their significance or sign. We analyse Model 2, as this model is extended with the additional explanatory variables, and this model has a higher R^2 .

According to the Table 6.2, the estimates suggest that share productive and religious are statistically significant with a positive sign, whereas share pre-productive, skilled workers, Roman Catholics and Hungarian are statistically significant with a negative sign. The share productive is the only variable significant on the 10% level, whereas other variables are statistically significant on the 5% and 1% level. The most significant variable is the share of the Hungarians; if we increase the share of this minority approximately by 3 p.p., there is a decrease in the SMER vote share by 1 p.p. Similarly, by increasing the county's skilled workers by 4 p.p., we can expect a 1 p.p. decrease in the political party's vote gain.

By comparing Model 3 and Model 4 we can see that share pre-productive turns to be significant. In the regression of the vote share given to LSNS, we see that all of our significant variables are significant on a 1% level. Highly statistically significant variables influencing the LSNS vote share positively are unemployment and Roman Catholics, although share pre-productive, skilled workers, Hungarians, religious have the opposite impact. Repeatedly, we experience that Roman Catholics are party's voters, whereas religious as a whole group does not vote for the party.

6.3 Pooled OLS

Once we have described elections separately, we can merge the datasets for both years into one in order to create two-period panel data. We use the year 2020 as a year dummy variable, and we interact it with the explanatory variables. We select variables that were in the previous models most often statistically significant; unemployment, share pre-productive and skilled workers. Table 6.3 represents the results of the Pooled analysis.

Table 6.3: Pooled OLS analysis

	<i>Dependent variable:</i>		
	SMER_voteshare	LSNS_voteshare	populist_voteshare
	(1)	(2)	(3)
unemployment	0.319** (0.144)	0.096* (0.055)	0.415** (0.175)
y2020	-10.153 (8.284)	4.597 (3.129)	-5.556 (10.049)
average_wage	-0.011** (0.005)	-0.002 (0.002)	-0.014** (0.006)
share_productive	-0.241 (0.420)	0.061 (0.159)	-0.180 (0.509)
share_preproductive	-0.802** (0.369)	0.091 (0.139)	-0.711 (0.447)
unskilled_workers	-0.190 (0.251)	0.067 (0.095)	-0.123 (0.305)
skilled_workers	-0.324*** (0.107)	-0.085** (0.041)	-0.409*** (0.130)
y2020:unemployment	0.045 (0.239)	0.110 (0.090)	0.156 (0.290)
y2020:share_preproductive	-0.161 (0.484)	-0.166 (0.183)	-0.327 (0.587)
y2020:skilled_workers	0.180 (0.150)	-0.047 (0.057)	0.133 (0.182)
Constant	77.784** (34.449)	5.952 (13.011)	83.736** (41.788)
Observations	158	158	158
R ²	0.526	0.298	0.489
Adjusted R ²	0.494	0.250	0.454
F Statistic	16.316***	6.242***	14.071***

Note:

*p<0.1; **p<0.05; ***p<0.01

The effect of the unemployment rate in 2016 is significant at the 5% level, causing that 3 p.p. increase of the variable leads to a 1 p.p. higher vote share of SMER. However, the t-statistic on the interaction term is not significant; the estimates are not statistically different from zero. We declare that there are not any significant changes in this variable over the years. Similarly, this behaviour is identical to other variables and their interaction terms. Additionally, our other models, namely LSNS and populist parties, equivalently do not display any significant changes in the interaction terms.

Since we detect no significance, we create another model to interact all of our explanatory variables with the year dummy. The outcome of the analysis displays no statistically significant interaction terms. The results of the model can be found in the Appendix D.

6.4 First-differencing

Table 6.4 represents results of estimation OLS first-differencing. The intercept illustrates that support of SMER fell substantially for Slovak counties over the examined four years. Since the variables regarding religiosity and ethnicity are collected only from 2011, they cannot be used in the first-differencing; we use only variables collected yearly here. Due to this fact, we can compare these results only to Model 1 (SMER) and Model 3 (LSNS) in the OLS regressions. The estimates propose that three of our variables are statistically significant, share productive at 5% level and share pre-productive and skilled workers at 10% level. The outcome shows that if counties decreased a share of the productive by a 1 p.p. over the years, the SMER's vote share decreased by 0.6 p.p. The same effect demonstrates the variable skilled workers; a 5 p.p. decrease of the variable results in a 1 p.p. decrease of SMER vote results. The opposite behaviour reveals a share pre-productive. The counties with a rising share of the pre-productive age population supported SMER more. We see that a 1.5 p.p. increase of the variable implies a 1p.p. higher vote share for the party.

In Model 2 (LSNS), we can see different voting characteristics. The only statistically significant variable is unemployment, at a 5% level of significance. It determines that in counties where the unemployment was decreasing, there was higher popularity of the LSNS party, which is the exact opposite result as we have examined in the models above. What is necessary to mention, the model is very weak, F statistics is not statistically significant, and R^2 is very low. Given that fact, we cannot rely on the results of this model.

The model with both populist parties shows the behaviour when we merge the parties. The F statistic shows the model's significance at a 5% level, which is definitely better than the significance of the LSNS model. However, we need to be careful about the results. We have two statistically significant variables: unemployment (at a 10% level) and share pre-productive (at a 5% level). The unemployment displays a negative sign, implying that we have a higher vote share by decreasing the share of variables. The opposite behaviour indicates the variable pre-productive; a 1 p.p. increase results in a 1.7 p.p. higher gain of populist parties.

By comparing the results to Model 1 in the OLS, we revealed that unemployment and average wage lost their significance. Even though wage lost its significance once we added additional variables, unemployment stayed significant. The coefficient of unskilled workers is another difference revealed by comparing to the OLS models. It is insignificant in the first-differencing, whereas in the OLS, it changed its sign depending on the used variables. These are the signals proving there are still some further unobservables biasing OLS results. The first-differencing is proof that the population's age structure affects voting preferences, meaning that more children in the county imply higher support for SMER. More productive people implies less post-productive, which causes lower support for SMER.

Additionally, it supports that the skill structure of employees matters too. The vote share of SMER decreases once there is a higher share of skilled workers. The results revealed that unemployment and average wage are somewhat correlated with unobserved county characteristics that make some counties more populist and some less. When comparing the results to OLS models of LSNS, we see that surprisingly the lower unemployment we have, the higher support of LSNS. However, the model is not statistically significant.

Table 6.4: First-differencing analysis

	<i>Dependent variable:</i>		
	SMER_voteshare	LSNS_voteshare	populist_voteshare
	(1)	(2)	(3)
$\Delta unemployment$	-0.063 (0.143)	-0.200** (0.081)	-0.263* (0.148)
$\Delta average_wage$	0.002 (0.008)	0.003 (0.004)	0.005 (0.008)
$\Delta share_productive$	-0.682** (0.321)	0.206 (0.181)	-0.476 (0.333)
$\Delta share_preproductive$	1.416* (0.737)	0.306 (0.416)	1.722** (0.764)
$\Delta unskilled_workers$	-0.058 (0.145)	-0.061 (0.082)	-0.119 (0.150)
$\Delta skilled_workers$	-0.190* (0.099)	0.035 (0.056)	-0.155 (0.102)
Constant	-14.112*** (2.267)	-1.494 (1.279)	-15.606*** (2.352)
Observations	79	79	79
R ²	0.220	0.125	0.177
Adjusted R ²	0.155	0.052	0.108
F Statistic (df = 6; 72)	3.383***	1.715	2.575**

Note:

*p<0.1; **p<0.05; ***p<0.01

Chapter 7

Conclusion

Populist political parties, extended worldwide, are analysed by many economists and sociologists since the consequences of their leaders are highly influencing the well-being of the country. Global society has been involved in populism for several decades, and it is no different in Slovakia. According to scholars, populists reap success in places with long-term declines and increasing economic inequalities (McCann, 2007; Poes, 2017).

We were interested in the behaviour of the individual Slovak counties with the intention to explore the key characteristics that might be affecting the support of Slovak populists. Therefore, this work aimed to analyse the vote share of the two populist political parties, SMER (left-oriented) and LSNS (right-oriented), in the Slovak parliamentary elections. We focused on what are the critical characteristics of Slovak counties voting for such parties. Hence, we built a model to estimate the relationship between the vote share of populist political parties and specific variables, namely demographic and socio-economic. Using the data for 79 Slovak counties for the two latest parliamentary elections taking place in 2016 and 2020, we determined the potential effects of the unemployment rate, average wage, skilled and unskilled workers, and other variables that could affect the election results. Accordingly, we used ordinary least squares regression and panel data methods - pooled OLS and first-differencing. We were detecting heteroskedasticity and multicollinearity in order to obtain consistent and compact results of the accurate models. The results demonstrated possessing heteroskedasticity in most of our models; therefore, we utilised robust standard errors.

The OLS estimation showed that counties with higher unemployment, lower average wage, less share of skilled workers and lower share of people in pre-

productive age are prone to vote for populist political parties. Our results were in accordance with Algan et al. (2017), who discovered the positive relationship between unemployment and anti-establishment parties' vote share. Also, given the ethnic and religious disposition, the biggest minority in Slovakia - Hungarians are vehemently opposed to voting for such parties. The surprising results were that Roman Catholics favoured voting for LSNS, whereas religious as a whole group was likely to vote for SMER. Inglehart and Norris (2016) similarly concluded that there is a positive relationship between religious people and the support of populist political parties.

The pooled analysis and first differencing were used to examine the trend and changes in the behaviour of voters between the individual elections. These analyses revealed no significant changes in variables over the years that would influence the vote results. The first-differencing revealed that the most influential voting factors for populist parties were the age and job structure of the population. However, average wage and unemployment rates are more likely correlated with the unobserved county characteristics, making some counties more populist and some less.

The outcome of this work could be extended by future research focusing on more populist political parties because the political scene evolves and changes. The research could be deepened by focusing on new data, as a new national census will be held in Slovakia in 2021. Having actual data on ethnicity or religion or adding variables such as education or gender structure would allow us to better analyse the proportion of votes.

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Appendix A

Explanation of variables

Table A.1: Explanation of variables

Variable	Explanation
unemployment	unemployment rate of the county
average_wage	average real wage
average_age	average age
productive	share of productive age in population
preproductive	share of pre-productive age in population
unskilled_workers	elementary occupations
skilled_workers	managers, professionals, technicians and associate professionals
roma_2018	share of Roma minority
religious_2011	share of religious people
romancatholic_2011	share of Roman catholics
hungarian_2011	share of Hungarian minority
nonslovak_2011	share of all non-Slovak minorities

Appendix B

Correlation tables

Table B.1: Correlation table 2016

	UN	WG	AG	PRO	PRE	ROM	UNS	SKI	RLG	RCAT	HNG	NSVK
UN	1	-0.63	-0.47	-0.15	0.44	0.77	0.29	-0.10	0.31	-0.21	0.17	0.37
WG	-0.63	1	0.38	-0.25	-0.21	-0.42	-0.51	0.44	-0.57	-0.07	-0.14	-0.24
AG	-0.47	0.38	1	0.17	-0.93	-0.55	-0.28	0.15	-0.52	-0.30	0.07	-0.04
PRO	-0.15	-0.25	0.17	1	-0.47	-0.40	0.12	-0.22	0.06	0.12	0.13	0.01
PRE	0.44	-0.21	-0.93	-0.47	1	0.61	0.17	-0.02	0.35	0.20	-0.07	0.05
ROM	0.77	-0.42	-0.55	-0.40	0.61	1	0.18	0.01	0.20	-0.21	0.10	0.31
UNS	0.29	-0.51	-0.28	0.12	0.17	0.18	1	-0.29	0.33	0.26	0.19	0.11
SKI	-0.10	0.44	0.15	-0.22	-0.02	0.01	-0.29	1	-0.41	-0.35	-0.06	0.03
RLG	0.31	-0.57	-0.52	0.06	0.35	0.20	0.33	-0.41	1	0.47	-0.05	0.07
RCAT	-0.21	-0.07	-0.30	0.12	0.20	-0.21	0.26	-0.35	0.47	1	-0.04	-0.25
HNG	0.17	-0.14	0.07	0.13	-0.07	0.10	0.19	-0.06	-0.05	-0.04	1	0.89
NSVK	0.37	-0.24	-0.04	0.01	0.05	0.31	0.11	0.03	0.07	-0.25	0.89	1

Table B.2: Correlation table 2020

	UN	WG	AG	PRO	PRE	ROM	UNS	SKI	RLG	RCAT	HNG	NSVK
UN	1	-0.63	-0.47	-0.15	0.44	0.77	0.29	-0.1	0.31	-0.21	0.17	0.37
WG	-0.63	1	0.38	-0.25	-0.21	-0.42	-0.51	0.44	-0.57	-0.07	-0.14	-0.24
AG	-0.47	0.38	1	0.17	-0.93	-0.55	-0.28	0.15	-0.52	-0.30	0.07	-0.04
PRO	-0.15	-0.25	0.17	1	-0.47	-0.40	0.12	-0.22	0.06	0.12	0.13	0.01
PRE	0.44	-0.21	-0.93	-0.47	1	0.61	0.17	-0.02	0.35	0.2	-0.07	0.05
ROM	0.77	-0.42	-0.55	-0.40	0.61	1	0.18	0.01	0.20	-0.21	0.10	0.31
UNS	0.29	-0.51	-0.28	0.12	0.17	0.18	1	-0.29	0.33	0.26	0.19	0.11
SKI	-0.1	0.44	0.15	-0.22	-0.02	0.01	-0.29	1	-0.41	-0.35	-0.06	0.03
RLG	0.31	-0.57	-0.52	0.06	0.35	0.20	0.33	-0.41	1	0.47	-0.05	0.07
RCAT	-0.21	-0.07	-0.30	0.12	0.20	-0.21	0.26	-0.35	0.47	1	-0.04	-0.25
HNG	0.17	-0.14	0.07	0.13	-0.07	0.10	0.19	-0.06	-0.05	-0.04	1	0.89
NSVK	0.37	-0.24	-0.04	0.01	0.05	0.31	0.11	0.03	0.07	-0.25	0.89	1

Explanation:

UN = unemployment

WG = average wage

AG = average age

PRO = productive

PRE = preproductive

ROM = share Roma

UNS = unskilled workers

SKI = skilled workers

RLG = religious

RCAT = Roman catholics

HNG = Hungarian

NSVK = non-Slovak

Appendix C

VIF values

Table C.1: VIF method values

<i>Variable</i>	<i>value</i>
unemployment	3.701
average_wage	3.697
average_age	63.385
share_productive	7.853
share_preproductive	66.190
unskilled_workers	1.694
skilled_workers	1.560
share_Roma2018	3.890
religious_2011	4.270
romancatholic_2011	3.093
hungarian_2011	13.262
nonslovak_2011	14.477

Appendix D

OLS Results

Table D.1: Determinants of vote share given to populist parties in 2016

	<i>Dependent variable:</i>	
	<i>populistparties_voteshare</i>	
	(1)	(2)
unemployment	0.313 (0.245)	0.574*** (0.101)
average_wage	-0.021*** (0.007)	-0.002 (0.004)
share_productive	-0.578 (0.548)	0.191 (0.261)
share_preproductive	-0.795 (0.488)	-1.822*** (0.179)
unskilled_workers	-0.327 (0.561)	0.323* (0.174)
skilled_workers	-0.381*** (0.121)	-0.353*** (0.064)
share_roma		0.256*** (0.083)
religious_2011		0.348*** (0.064)
romancatholic_2011		-0.023 (0.031)
hungarian_2011		-0.547*** (0.022)
Constant	122.123*** (42.601)	33.423 (23.242)

Note: *p<0.1; **p<0.05; ***p<0.01
robust standard errors in parenthesis

Table D.2: Determinants of vote share given to populist parties in 2020

	<i>Dependent variable:</i>	
	<i>populistparties_voteshare</i>	
	(1)	(2)
unemployment	0.645** (0.283)	0.799*** (0.187)
average_wage	-0.007 (0.006)	-0.003 (0.003)
share_productive	0.331 (0.715)	0.149 (0.446)
share_preproductive	-0.965*** (0.358)	-1.854*** (0.247)
unskilled_workers	0.087 (0.314)	0.059 (0.184)
skilled_workers	-0.289** (0.113)	-0.311*** (0.073)
share_roma		0.208 (0.132)
religious_2011		0.162** (0.065)
romancatholic_2011		0.065* (0.035)
hungarian_2011		-0.399*** (0.018)
Constant	33.793 (54.084)	39.955 (30.947)

Note: *p<0.1; **p<0.05; ***p<0.01
robust standard errors in parenthesis

Table D.3: Pooled OLS analysis

	<i>Dependent variable:</i>		
	SMER_voteshare	LSNS_voteshare	populist_voteshare
	(1)	(2)	(3)
unemployment	0.225 (0.169)	0.087 (0.064)	0.313 (0.205)
y2020	-95.729 (67.836)	7.398 (25.708)	-88.330 (82.394)
average_wage	-0.018** (0.007)	-0.003 (0.003)	-0.021** (0.009)
share_productive	-0.670 (0.551)	0.092 (0.209)	-0.578 (0.670)
share_preproductive	-0.909** (0.389)	0.114 (0.147)	-0.795* (0.472)
unskilled_workers	-0.300 (0.354)	-0.028 (0.134)	-0.327 (0.430)
skilled_workers	-0.298** (0.116)	-0.083* (0.044)	-0.381*** (0.141)
unemployment:y2020	0.210 (0.297)	0.123 (0.113)	0.333 (0.361)
y2020:average_wage	0.012 (0.010)	0.002 (0.004)	0.014 (0.012)
y2020:share_productive	0.990 (0.856)	-0.081 (0.325)	0.909 (1.040)
y2020:share_preproductive	0.039 (0.542)	-0.208 (0.206)	-0.170 (0.659)
y2020:unskilled_workers	0.221 (0.504)	0.194 (0.191)	0.414 (0.613)
y2020:skilled_workers	0.143 (0.169)	-0.051 (0.064)	0.092 (0.205)
Constant	116.971** (45.379)	5.152 (17.198)	122.123** (55.118)
Observations	158	158	158
R ²	0.533	0.304	0.495
Adjusted R ²	0.491	0.241	0.450
F Statistic (df = 13; 144)	12.640***	4.828***	10.867***

Note:

*p<0.1; **p<0.05; ***p<0.01