

# The Influence of the Economic Disparities Between Regions on Political Polarisation in the Czech Republic

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## Abstract

This paper aims to evaluate how the economic prosperity of regions affects the polarization of political representation, and thus of society. It examines whether economically prosperous regions, represented by economic well-being, show lower political polarisation, and whether regions with lower levels of economic prosperity are more likely to elect polarised and extreme political representatives. The paper focuses on the period from the establishment of the Czech Republic in 1993, to the last elections in 2021 in the NUTS 3 regions of the Czech Republic. Evidence was provided through a determination of the effect of economic well-being, defined by three indicators, i.e., gross domestic product per capita, unemployment, and disposable income per capita, on the development of a created political polarisation index. This index is based on the left-right ideological party division combined with election results for the Chambers of Deputies of the Parliament of the Czech Republic of regional districts. Sociodemographic indicators of the development of the individual regions were used as control variables. These include the average population, share of the university-educated population, age indicators, population density of a given region, voter turnout in a specific election year, and various positions in the institutional setting of the Czech Republic. The most significant components of economic well-being that influence the development of polarisation are the growth of disposable income and unemployment. This is demonstrated through a quantitative economic analysis of the panel dataset using the least squares with fixed effects method that uses time-fixed and region-fixed effects.

## Keywords

Czech Republic, Polarisation, Politics, Economic Well-Being, Political Economics, Disposable Income

## JEL Classification

D72, E61, I31, P16

## Introduction

The political development of a state is closely linked to its economic situation. Across the world, we can find less economically developed states that are characterized by weak or corrupt governments, with limited freedom within the (democratic) political process. The situation in these countries improves rather slowly. On the contrary, in developed parts of the world, generally functional democracies can be seen, where citizens are properly represented and the political process is quite functional, along with their economies. The Czech Republic is unique in this respect. A sovereign state in central Europe, which experienced periods of suffering after the First Czechoslovak Republic and its economic boom. Firstly, after the creation of the Protectorate of Bohemia and Moravia and the occupation of the borderlands, followed by decades of economic (and societal) disintegration under the influence of the Soviet Union. The economic boom of the 1990s and newly acquired freedom and democracy were the foundation stones for the development of modern political arrangements of the state. All Central European states went through a similar process as populists came to power. In Hungary, the process led to an authoritarian regime. As argued by Vachudova (2019), the question is whether the Czech Republic will continue to withdraw from populist governments as it did in the elections of 2021, or whether it will follow in the footsteps of Hungary. This research into the development and variability of political polarisation and its link to the disparities in economic well-being between regions of the Czech Republic might help predict the future course of polarisation.

The literature so far does not deal with the exact case of the Czech Republic. Political polarisation disrupts the democratic processes of the state, and its effects can lead to blockage of the legislative process, which can also affect the economic development of the state (Barber & McCarty, 2015; Jones, 2001; Voorheis et al., 2015; McCoy et al., 2018). Political polarisation can be defined in different ways (phases), i.e. institutional polarisation, false

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polarisation, affective polarisation, and ideological polarisation (Wilson et al., 2020). This paper works with ideological polarisation, due to its longer inertia and lower dependence on the current attitudes of political elites, media, and social media. The influence of state economic conditions on the development of political polarisation is confirmed in works such as Funke et al. (2016), Mian et al. (2014), Večerník (2015), and Dynan & Scheiner (2018). In the context of regions, polarisation is observed because each state exhibits some within-country disparities, and national aggregate measures may not be accurate in describing the reason for the development of political polarisation. Disparities are based, among other things, on the level of economic development (economic well-being), the level of urbanisation, or the level of education of the population. When a region shows lower values of these factors, citizen dissatisfaction becomes associated with the election of more extreme, antisystem parties and with higher political polarisation (Bettarelli & Van Haute, 2022; Dijkstra et al., 2020; Mckay, 2019, Rodríguez-Pose, 2020; Greve et al., 2022).

The unique contribution of this paper is the use of a unique self-constructed polarisation index that provides a complex view of the evolution of political polarisation and can be used for research in other papers, and while analysing other states. It is possible to expand it to include other observed ideological spectrums. Similarly, the paper is unique in focusing on the political polarisation of the Czech Republic, at the level of NUTS 3 regions. In principle, the findings are consistent with developments in other countries where the interdependence of state economic situation and political polarisation has been demonstrated (Mian et al., 2014; Ayiar & Ebeke, 2020; Grechyna, 2016). Thus, the functionality and use of the self-created index of political polarisation, the methodology, the regional focus of this paper, and the results for the Czech Republic can be argued with a few reservations.

The paper contains as follows. First, it deals with the determinants and impacts of (political) polarisation, with an analysis of what is polarisation, the typology of polarisation, what it generally affects and the effects it might have on society. Then political polarisation is discussed as one of the possible displays of the theory of political cycles, which demonstrates the link between the economic state of a country and political processes. Furthermore, research in the literature that deals with the link between political polarisation and the economic state of the country is carried out with a focus on the most appropriate indicators of economic conditions for further research into polarisation. In the following, the regional approach to political polarisation and its rationale are discussed. Gross domestic product (GDP), disposable income, and unemployment are chosen as indicators of the economic development of the regions under study. These are also used in growth form (relative to the previous reference period) and together represent the economic well-being of the population as the main explanatory variable of political polarisation. In addition, several sociodemographic and socioeconomic control variables are used, and the panel data are processed using OLS with fixed effects method (using time- and region-fixed effects for each year the elections take place and each of the 14 NUTS 3 regions). The explanatory variable is a self-created index of polarisation based on the left-right ideological spectrum, where the spillovers of voters between political parties over time are observed. This index uses data on the ideological positioning of the parties from the ParlGov project (Döring & Manow, 2023) and the electoral results of the Czech Statistical Office (2023). The paper concludes that political polarisation in the regions of the Czech Republic depends on the development of disposable income and the growth of unemployment. Higher growth in disposable income decreases political polarisation in a region, while higher growth in unemployment increases political polarisation. Political polarisation in the Czech Republic regions is also affected by several factors that depend on the institutional environment, satisfaction with the institutions, trust in these institutions and traditions.

## Literature Review

### *The determinants and implications of political polarisation*

The comprehensive answer to the question of what is polarisation comes with the help of the definition from DiMaggio et al. (1996) and Esteban & Ray (1994). Polarisation expresses the degree of disagreement (different, or even opposite opinions) between two or more individuals. As a rule, it is not possible to simplify polarisation to bipolar agreements or disagreements with a given argument; it is necessary to establish the degree of strength of polarisation. (Esteban & Ray, 1994). Not only the degree, but also the process of disagreement can be considered to be polarisation. The level of polarisation expresses the maximum theoretical value of the degree of disagreement with a given argument. Polarisation as a process shows the development of such disagreements or differences of opinion over time. This paper deals with the development of polarisation and especially the reasons for such developments. The free expression of opinions that have been formed is directly dependent on an individual's degree of aversion to conflict, the possibility of discussion with an opposing individual, and the probability of identifying an opposing opinion (DiMaggio et al., 1996).

The definition of political polarisation is based on research by Dalton (2008). Dalton focused on the measurement of polarisation based on a previous definition from DiMaggio et al. (1996), thus on the quality of party competition, rather than on the outdated fragmentation of the political spectrum. This approach is more suitable, not only for measuring polarisation in a bimodal political system but also within multiparty systems such as is found in the Czech Republic, and polarisation is measured by examining developments on ideological spectrums. Significant

polarisation affects the attitude of voters towards politics, disgust and a general disinterest in political affairs come to the fore, as does detachment from the views of the previously preferred party (which can eventually lead to the central voter's theorem, the process by which polarisation returns to its original state) and lower turnouts (Fiorina et al., 2005). Hetherington (2001) opposes these views, arguing that polarisation is positive in terms of producing clear identification of voters with elected parties because these parties do not seek to reach the centre voters, and conversely design their agendas to ensure that they do not overlap with other parties. Gersbach (2019) demonstrates that due to a greater degree of competitiveness, caused by polarisation, negative consequences may not always be associated with a party, such as the strong polarisation of the agenda of the governing party and a decline in well-being. According to Wilson (2020), it has not even been proven that when there is no polarisation (i.e., domination of the centre parties) there are, in all cases, better socio-economic results.

Regarding the development of polarisation in the current century, according to Wilson et al. (2020), the media and social networks make a strong contribution to polarisation. These networks take advantage of polarisation (amplifying it, for example, through ridicule, by user exaggeration) to promote themselves and increase their traffic. In the case of social networks, it is difficult to avoid similar situations, even though their representatives have recently been forced to do so. Again, this can be a source of conflict, with one group defending similar interventions as necessary to allow democratic debate, and the other attacking them as unauthorized interference with their views. The very division into separate opinion groups leads to aversion on both sides and the formation of so-called 'social bubbles'. After they have formed, it is much more difficult to reverse the polarisation of the group's opinions, as they cannot accept the views of other groups. Such an environment favours politicians who promote much more extreme views and suppresses sober, centrist views of the common spectrum.

### ***Forms of political polarisation***

Political polarisation is a complex problem and is often referred to from multiple perspectives in the literature. However, these perspectives can be effectively combined by dividing the polarisation of society into different phases. According to Wilson et al. (2020), political polarisation has its origins in 'institutional polarisation'. The elites themselves are polarised, the media and social media are not objective and support ideologically close political elites. External factors such as economic factors (crises, economic downturns) may also play a role, to which elites and media react. Political elites can polarise society deliberately if they represent more extreme views and seek to fuel the negative attitudes of society to gain more votes. Next comes the so-called 'false polarisation', which brings misconceptions about the opinions of other individuals and groups and the false belief that the opinions of others must be opposite to those of the individual in question. This leads to distrust between groups and mutual hatred and disrespect (Wilson et al., 2020; Levendusky & Malhotra, 2016; Ahler & Sood, 2018). This false view is amplified for extreme positions (e.g. views on ethnic minorities and gun ownership) that may simplistically characterize the worst of the other side and, conversely, is weakened for moderate policy views of groups (Westfall et al., 2015). False polarisation leads to 'affective polarisation'. The latter expresses to what degree the individuals dislike do not trust and avoid the opinions of the other side (Iyengar et al., 2019, Chen & Rohla, 2018). The last stage of this process is 'ideological polarisation'. This polarisation stands separately, outside this cycle of animosity, and is not competitively dependent on affective polarisation but may be influenced by it in the formation of ideological stances (Wilson et al., 2020). It expresses the preferred policy positions of individuals and a more permanent affiliation with an elected party, based on internal beliefs. These phases of polarisation then lead to the actual choice of political elites and the eventual cycle of political polarisation, which continues to grow.

This paper considers political polarisation in the context of ideological polarisation, which can be observed in a given electoral decision, i.e., which party a given voter chooses, and is not as strongly influenced by the aforementioned cycle of polarisation, i.e., by misconceptions and emotionally influenced opinions, and is more related to one's own, less influenced opinion and policy position (Wilson et al., 2020).

### ***Is political polarisation beneficial for the political process or not: the problem of endogeneity***

Political polarisation affects the very democratic set-up of the state and its functionality. Research by Barber & McCarty (2015) confirms the undermining of governance through legislative gridlock and lower-quality legislation, with polarised governments unable to agree on important issues and policies. Thus, polarisation undermines the effectiveness of the democratic process. Bettareli et al. (2022), Kingzette et al. (2021), and McCoy et al. (2018) follow up by arguing that affective polarisation undermines the support for democratic norms, just when the affectively polarised partisans supported party is in power, which can lead to the gradual erosion of the rule of law. Legislative gridlock based on political polarisation and its consequences is also addressed by Jones (2001), Voorheis et al. (2015), McCoy et al. (2018) and Binder (1999). Gridlock occurs when increased interparty polarisation takes place, and, at the same time, non-government parties with their number of mandates are able to veto new legislation. However, gridlock also occurs to the same extent if the government consists of multiple parties that are also polarised among themselves. Lindqvist & Östling (2010) also agree. According to their research, political polarisation has a stronger effect in states with fragmented governments that blackmail each other to satisfy their own voters. The consequence of legislative gridlock can be observed in the further development of a state's

economy. Grechyna (2016) argues that political instability and the impossibility of agreeing on effective economic measures (legislative gridlock), for example, in response to financial and economic crises, leads to higher public debt and high political polarisation leads to higher public spending. According to Grechyna (2016), polarization has a large impact on state economic performance and also strongly influences investment, fiscal policy, legislative productivity, macroeconomic volatility, income inequality, and overall economic development. According to Wilson et al. (2020), Druckman et al. (2013), political polarisation is dangerous due to its ability of self-reinforcement. The process of polarisation (by elites, or through media and social networks) leads to so-called false polarisation, i.e. misperceptions of division among the electorate (social bubbles, dividing society into "us" and "them"), which leads to affective polarisation, which fuels animosity until even the further ideological polarisation occurs over time.

Duell & Valasek (2019) carried out extensive research on the topic of the benefits and drawbacks of political polarisation in terms of economic consequences. These authors tried to disprove the assumption that polarisation is a positive phenomenon in terms of increasing voter participation in the political process. Research has shown that political representation under the influence of polarisation does not align according to the social optimum and that voters prefer candidates of lower quality (in terms of qualifications), but with more refined and louder opinions. The same conclusion was drawn by Azzimonti (2009), who added that the polarisation of society has a direct effect on the government's acceptance of short-sighted economic solutions. This leads to low levels of investment, which affects economic growth. The greater the degree of polarisation, the greater the inefficiency. The principle is simple: opposing groups, whose views are fundamentally different due to a high degree of polarisation (even in terms of economics), want to enforce their own view of fiscal policy. The government is usually confronted by the opposition, which is trying to bring the second electoral camp on its side. Dissatisfied voters can be silenced by increased government spending, lower taxes, and deficit funding (at the expense of the next generation). In the long run, this leads to the push out of private investment and two possible scenarios. Either the current (usually the next) government will take advantage of the cuts and start to tighten its policy to prevent further growth in the budget deficit, which is accompanied by an economic slowdown. Alternatively, it will continue with a similarly irresponsible policy until the system is on the verge of collapse. In this case, it is likely that the electoral camps will eventually unite and choose the 'golden average' that will anyway cause the otherwise unpopular belt tightening. Duell & Valasek (2019) further state that the significance of 'social' polarization, that is, differences of opinion on social policy, are related to the very social well-being of the population and the degree of inequality. If the level of social polarisation is low (social issues are not particularly important for the given population), there is a low degree of political polarisation in economic issues, fiscal policy, etc., and an effective, working government agency, able to compromise, is chosen.

The literature supports the premise that political polarisation has more drawbacks than benefits prevail, and polarisation might have additional effects on the economy and society of the state. Polarisation might cause entry into a cycle where poor economic conditions, for example, as a result of an economic crisis, lead to an increase in polarisation, and thus the polarised governments that are elected might not prioritize the improvement of economic conditions, which in turn prolongs the inertia of polarisation.

### ***Political polarisation as a display of the theory of political cycles***

After examining the context of political polarisation, it is necessary to set it in the context of the theory of political cycles. The theory is based on periodic fluctuations of fiscal policy depending on the election cycle. An interesting overview of the existing literature and findings is provided by Shi and Svensson (2003). This approach is based on the rational and strategic behaviour of politicians and voters. Politicians influence fiscal policy so they are reelected and try to stimulate the economy before elections, sometimes at the cost of increasing the national debt (according to their degree of responsibility and ideological direction). The rational voter behaves in this way, because short-sighted policies are effective thanks to the signalling effect, as voters have imperfect information about the characteristics of a potential government or party and automatically consider them capable and high-quality, based on their communication. According to their research, left-wing parties are not reluctant to solve the problem of unemployment, even at the cost of increased inflation. Similarly, Martinez (2009) proves that governments influence economic conditions at the end of their term, rather than at the beginning. Voters only follow their performance, if their performance is good, according to the voter, it will be the same in the future. At the same time, a moral-hazard-based approach shows up, as instead of electing a more competent government, voters lean towards a government that ensures greater intervention in the economy for their benefit. As a rule, political cycles are examined through the development of GDP, or the ratio of taxes vs. spending. Bojar (2017) reveals that not only the ideological position of the voter but also his socioeconomic background influences them within a political cycle. The lower classes are sensitive to changes in the preelection fiscal policy of the government, especially regarding the expenditure side of the budget. This paper uses economic indicators from the year preceding the election, since voters are influenced by the latest economic results, according to the theory of political cycles.

### ***The dependence of political polarisation on the state of the economy***

The idea that there is a connection between economic prosperity and political polarisation has been developed, for

instance, by Funke et al. (2016). This paper demonstrated the theory of the impact of financial crises on political polarisation in Europe (a dataset of all elections that have taken place since the beginning of the twentieth century was used). The main benefit of this research was the finding that financial crises cause the fragmentation of government majorities. On average, after a crisis, voters turn to the far right (an average increase in votes of 30%, compared to their original values). However, common cyclical recessions do not cause polarisation to a similar degree, voters are aware of the impact of business cycles. Consequently, increased fragmentation and polarisation also lead to an extension of the resolution of the crisis, reduce the likelihood of effective reforms, and increase the number of political conflicts. The strong relationship between economic conditions and political polarisation was also demonstrated by Mian et al. (2014) with an emphasis on increased polarisation during periods of crisis. A financial crisis affects borrowers, with worse repayment options, which can lead to insolvency. On a larger scale, i.e., in a deep crisis, a collective inability to repay can lead to a systemic problem. This problem is the cause of political polarisation. The crisis leads to political 'jamming' after the elections, to an inability to compromise, and to systemic polarisation. It also leads to the election of more extremist politicians and thus to weak and fragmented governments. The state of the economy directly affects equality of opportunity, as argued by Ayiar & Ebeke (2020) and Neumayer (2007). When there are poorer economic conditions, voters may have unequal access to education and the labour market and, therefore, to a higher disposable income. Based on the income inequality that this causes, voters decide on their political representation. It is appropriate to take these results into account in further analyses, but the question remains, which method is most appropriate to use for the measurement of the state of the economy.

### ***Selecting an appropriate indicator of the state of the economy: economic well-being and its influence on political polarisation***

For further analysis, it is important to determine the appropriate economic indicators that might affect political polarisation. In the following literature, individual indicators are analysed as a representation of economic well-being, which covers the individual indicators and expresses the standard of quality of life of the population. Based on their standard of living, voters then choose their representation based on their best interests related to improvement or preservation. This development can be observed on a selected left-right ideological spectrum, which is based on the economic stance of voters in general.

Regarding the definition of economic well-being, according to Večerník (2015), indicators that could be considered are, for example, GDP per capita or disposable household income (Večerník, 2015; van den Bergh & Antal, 2014). GDP per capita and unemployment can be described as a macroeconomic view of the measurement of subjective well-being and disposable income as a microeconomic view. The influence of inflation was also examined, but it was not proven. Večerník also noticed some interesting facts related to differences in the perception of profit and loss. Večerník worked with data from postcommunist Central European countries, which showed an increase in subjective feelings of 'happiness' and economic prosperity after the revolutions of the late 1980s, followed by subjective dissatisfaction in later years. Economic well-being ceased to grow so sharply, even though it was still on the rise (there were only relatively minor and short-term declines during this period). Večerník refers to a phenomenon called "aversion to loss", developed by psychologists at the beginning of behavioural economics - Kahneman & Tversky (2010). This phenomenon manifests itself as a subjective assessment of loss as a much stronger feeling than of profit. Therefore, using the example of disposable income, if there is an increase in disposable income of CZK 100 per year, the feeling of subjective happiness from this increase is incomparable to the feeling of loss if disposable income decreases by CZK 100. This phenomenon can affect the subjective assessment of economic well-being. For this reason, the author uses objective economic indicators based on secondary data, according to which economic well-being will be evaluated.

Xiao (2015) proposes the gross domestic product as the primary indicator of economic well-being. According to Xiao, it should exhibit a positive correlation with well-being. The same conclusions were also provided by Dynan and Scheiner (2018), with the reservation that although the GDP indicator provides much information, it does not, on its own, provide comprehensive information about economic well-being. Therefore, it is appropriate to include other indicators that express the standard of living of the population in any definition of well-being. Xiao also includes income, expenses, debt, and other assets owned in their consumption indicators. This paper will use a simplification, in the form of disposable income, from which the other three components are financed. The economic well-being of the consumer is positive if the consumer feels subjectively that they have sufficient disposable income and are able to maintain it over time. In opposition to the use of GDP to define well-being are Costanza et al. (2009), Jansson (2022), who criticize GDP from the position of its obsolescence and propose the use of indicators that also include sustainable growth, i.e., growth that improves the quality of human life while supporting the ecosystems.

According to Han (2015), the degree of political polarisation of the parties depends on two factors, increasing income inequality and institutional flexibility. Increased income inequality (and the consequent reduction in economic well-being) creates a demand for more extreme political leaders and shifts the arguments of political parties to more extreme positions. On the contrary, this shift is smaller if the political system is limited by the

presence of fewer political parties, that is, less competition and a less liberal environment. Thus, in a system characterized by many parliamentary and broad party coalitions (for example, the Czech Republic after 2010), polarisation is more likely to occur than in bilateral systems (for example, the United Kingdom). Similar conclusions were drawn by Grechyna (2016), polarisation strongly correlated with income inequality and overall voter trust. Higher levels of trust reduce polarisation, and a greater degree of income inequality increases polarisation. The correlation of these indicators is stronger in democratic countries, where voters have a more direct influence on election results (of the chosen political party). However, although indicators of income inequality might be more appropriate for a determination of economic well-being than disposable income, these data are not available at a regional level for the Czech Republic, thus disposable income of households will be representing income levels and its inequalities between regions as Jones & Klenow (2016) suggests.

The research mentions many factors that support the theory that there is a connection between the economic well-being of voters and the decision-making process in elections. Individual differences (and especially their discrepancies) in the literature are the reasons for the further analysis that this paper provides. The paper prefers to use secondary economic data to assess the connection with political polarisation. This is due to the complexity of a subjective expression of well-being, which depends on both the living conditions of the individual and other institutional factors, even the background from which the individual comes. That affects their perception of well-being and is not comparable to other individuals. Based on previous research, GDP per capita (Večerník, 2015; van den Bergh & Antal, 2014), household disposable income per capita (Jones & Klenow, 2016), and unemployment (Gedikli et al., 2021; Binder & Coad, 2014) were selected to describe the relationship between economic well-being and polarisation. GDP is a suitable general indicator of the state of the economy, i.e. the overall economic well-being of a given region. The development of disposable income best reflects the living conditions of households and the population, and unemployment is also directly related to the living conditions of the population, especially its livelihoods and job stability (the same as the threat of unemployment), and these may be reasons for electoral spill over in the electoral process.

Concerning the literature devoted to the performance of regions and its impact on territorial development in the context of the economic fortune of territories and their divergences, this paper uses the growth forms of GDP, disposable income, and unemployment, following Rodríguez-Pose (2020), Hák & Janoušková (2013) and Bettarelli & van Haute (2022) for a broader definition of economic well-being. It is the development of these variables over time (between the observed election periods) according to these researches that influence political decision-making and opinions of voters, rather than the current level of these variables.

### ***Regional influences on political polarisation: socioeconomic disparities and the impact of local development***

This paper uses a regional approach to political polarisation. Each state exhibits certain within-country disparities, and national aggregate measures may not be sufficiently accurate in describing the development of political polarisation. Bettarelli & Van Haute (2022) conclude that socioeconomic disparities between regions lead to different values of political polarisation, which is supported by differences between urban regions that exhibit higher economic development, attract skilled workers, and rural regions that are in the process of depopulation, experience the so-called 'brain drain', and experience an economic decline (Bettarelli & Van Haute, 2022; Gimpel et al., 2020; Rodríguez-Pose, 2020).

The relationship between political polarisation and socioeconomic disparities between regions is discussed in Dijkstra et al. (2020), McKay (2019), and Maxwell (2020). These argue the fact that even with the growth of the national economy, the guiding question is whether the economy of one's local community grows. If not, these groups gain a sense of being neglected, and this leads to an exaggeration of their ideological positions. Therefore, it is not possible to observe the development of political polarisation only from a national perspective (McKay, 2019). Dijkstra et al. (2020) examine polarisation from the perspective of attitudes towards European integration, where the choice of anti-establishment, antisystem, and anti-European parties occurs precisely in regions that show a larger proportion of the economically weaker population with the educational divide as another factor. From a regional perspective (Ford & Jennings, 2020; Gimpel et al., 2020), in addition to the educational divide, regional differences in ethnic diversity, age composition, and the extent of urban areas (namely the divide between thriving major cities and declining towns and rural areas) also play a role. These regional differences in development, and the associated dissatisfaction of citizens in these regions, are associated with the election of more extreme, antisystem parties, and higher levels of political polarisation can be expected in these regions (Dijkstra et al., 2020; McKay, 2019; Rodríguez-Pose, 2020; Greve et al., 2022; Zaid & Joshi, 2018).

### **Methods**

This paper uses data from the ParlGov project (Döring & Manow, 2023), which focused on the division of political parties on various ideological spectra, and data from the Czech Statistical Office (2023), which provides the results of elections to both the Chamber of Deputies of the Czech Parliament at a regional level (14 Czech regions at

NUTS 3 level) and the necessary economic indicators, also at a regional level. This paper uses its self-created index to evaluate the extent of political polarisation, based on the left-right political spectrum, which still proves to be the most commonly used spectrum for political analysis. The left-right division could be considered outdated (thanks to the rise of new 'catch-all' parties that do not fit neatly into these traditional categories) but combined with the given data set the left-right spectrum aligns well due to the later analysis, therefore, it was considered sufficient. The left-right spectrum is still seen as a useful tool for understanding the broad range of political beliefs and ideologies that exist in a society and is often used in comparative politics, as it allows for cross-national comparisons of political ideologies and beliefs. This comparison is easily understandable even for voters who are generally able to place themselves on this spectrum. This can be particularly useful in studying political polarisation, as it allows researchers to compare the degree of polarisation in different countries and identify patterns and trends. The relevance of the left-right spectrum for use as the description of the political situation in the state is further discussed in the research of Wojcik et al. (2020), Simmons et al. (2018), Caprara & Vecchione (2018).

The hypothesis states that political polarisation is dependent on economic well-being at a regional level within the Czech Republic. Data from the ParlGov project are used to determine the position of the given parties in the left-right ideological spectrum - the extreme left-wing parties receive a value of  $-5$  by the project experts, the extreme right-wing parties are given  $+5$  and are divided into individual groups according to the left-right spectrum. The data are then transformed into a separate polarisation index for each region. The cumulative results of the group's voting for each year are multiplied by the polarisation value (on the ideological spectrum) of the group of parties to give an absolute value, which represents the 'weight of polarisation'. Then, all the values of any given year and region are added together. On the basis of this, a polarisation index is created for the individual regions and election years. The result of the index is then divided by one hundred for greater clarity. Thus, for example, if in a specific election, the parties at the exact centre of the spectrum receive 20% of the vote, these results are multiplied by zero. If the group of extreme right parties (valued at  $+5$ ) received 60% of the vote and the extreme left parties (valued at  $-5$ ) 20% and there were no other parties elected, the final index of polarisation in this extreme example would have a value of 4. Only parties that exceed the current requirements to obtain a contribution from the state budget for party activities, which is 3% of the votes cast, were taken into account within individual years. These data will then be analysed using the OLS method with fixed effects (most suitable for given panel data) together with selected indicators of economic well-being. The method uses time-fixed effects for each year the elections take place, and region-fixed effects for each of 14 NUTS 3 region of Czech Republic. These fixed effects are used to correct the variables that change over time and to specify any regional-specific effects, considering the differences in the regions of the Czech Republic.

Economic well-being is represented by the following indicators: Gross domestic product per capita, net disposable household income per capita, and unemployment. Data are drawn from the Czech Statistical Office (2023). The NUTS 3 regional accounts are used, with data from their establishment in 2000 and backward calculation of data to the formation of the Czech Republic in 1993. The methodology used to create these data corresponds to the European System of Accounts (ESA, 2010), and they are comparable and harmonized. The data is calculated using the workplace method, that is, the results from units are placed in the regions according to their actual place of operation. Furthermore, the economic results of units that operate in several regions are calculated based on the number of employees in the specific regions, and the indicator of disposable household income relates to the place of residence (Czech Statistical Office, 2023).

The paper further employs five sociodemographic control variables that influence election results, according to the current literature on political polarisation. The source of the data is also the Czech Statistical Office (CZSO, 2023). They are voter turnout by region and election year, the average population, the share of university educated people in the population, population density, and the share of the population of the outer age groups (voters aged 20 to 29 and 65 years and older). The share of university-educated people was created by including the population census data (which have been taken every 10 years since 1991). The annual data were not available, so these were added according to the natural movement of the population according to the data from the CZSO. The use of sociodemographic control variables, namely education variables, is supported by research by Hayo & Seifert (2003) and Stanig (2013), who also used age variables. Hayo and Seifert (2003) also included population density (community size). State population, voter turnout, and population density were also used by, for example, Lindqvist & Östling (2010). Turnout and education variables are also mentioned by Doležalová et al. (2017). All 5 control variables were also used in this context by Finseraas & Vernby (2014). The paper also uses nine sociological variables based on the European Social Survey (ESS, 2023). Data from ESS (2023) are available for the years 2000 – 2020 at 2-year intervals; the survey was not conducted in the Czech Republic in 2004. Missing values are added by fitting the values of the given data with a linear trend.

The paper uses a regression model for all the regions studied in the Czech Republic in the following form:  $Polarisation_{i,t}$  as an explained variable where  $i = 1, 2, \dots, 14$  for the Czech Republic regions,  $t = 1992, 1996, \dots, 2021$  for the election year (9 observations). The basis of the polarisation index is as explained previously.  $\alpha_i$  is a constant,  $\beta_j$  the regression coefficients, and  $\varepsilon_i$  a random component.  $GDP_{i,t}$  represents the gross domestic product per capita in CZK in the year before the election according to data from the Czech Statistical Office (as

with the following variables).  $Unemp_{i,t}$ , represents the level of unemployment in the year before the election and  $Disp\_income_{i,t}$ , represents the disposable income per capita of households in CZK again in the year before the election. Following the research by Bettarelli & Van Haute (2022) and Rodriguez-Pose (2020), indicators of the development of GDP, unemployment, and disposable income between the observed periods were also used as variables  $GDP\_develop_{i,t}$ ,  $Unemp\_develop_{i,t}$ , and  $Disp\_income\_develop_{i,t}$ .  $Turnout_{i,t}$  is the control variable representing voter turnout in percentage,  $Av\_pop_{i,t}$  is the average regional population for a given year,  $Dens_{i,t}$  the regional population density in people per square kilometer,  $University_{i,t}$  the share of the university-educated population expressed as a percentage of the total,  $Outer\_age_{i,t}$  the share of outer age groups of voters of the population expressed as a percentage and  $Women\_share_{i,t}$  representing the share of women in the total population of the region. The other control variables are the variables of the European Social Survey (2023). These are  $Stfdem_{i,t}$ , satisfaction with the way democracy works in the Czech Republic;  $StfecO_{i,t}$ , satisfaction with the current state of the economy of the state;  $stfgov_{i,t}$ , satisfaction with the national government;  $Stflife_{i,t}$ , satisfaction with life as a whole;  $Trstplt_{i,t}$ , representing trust in politicians in general;  $Trstprl_{i,t}$ , representing trust in the country's parliament;  $Happy_{i,t}$ , representing how happy is given respondent;  $Rldgr_{i,t}$ , representing how religious is given respondent;  $Imprtrad_{i,t}$ , representing how important it is to follow traditions and customs due to the respondent. The variables of ESS (2023) are expressed in the regression model as the variable  $Xa_{i,t}$ . The variables  $GDP$ ,  $Disp\_income$ ,  $Av\_pop$  are expressed in a logarithmic form to provide greater clarity in the results. The regression model will be used in the following form:

$$\begin{aligned}
 Polarisation_{i,t} = & \alpha_i - \beta_1 GDP_{i,t} + \beta_2 Unemp_{i,t} - \beta_3 Disp\_income_{i,t} - \beta_4 GDP\_develop_{i,t} \\
 & + \beta_5 Unemp\_develop_{i,t} - \beta_6 Disp\_income\_develop_{i,t} + \beta_7 Turnout_{i,t} - \beta_8 Av\_pop_{i,t} \\
 & - \beta_9 Dens_{i,t} - \beta_{10} University_{i,t} + \beta_{11} Outer\_age_{i,t} + \beta_{12} Women\_share_{i,t} + \beta_{13} Xa_{i,t} \\
 & + \varepsilon_i
 \end{aligned} \quad (1)$$

The paper assumes the same premise for each of the regions. Polarisation will be negatively affected by the value of the gross domestic product per capita. Therefore, if the GDP per capita decreases, the polarisation indicator will increase. The indicator, household disposable income per person, should also show the same relationship. It is a measure of the economic level of the region and, if it is lower, dissatisfaction of the citizens can be expected (Bettarelli & Van Haute, 2022). On the contrary, the impact of the unemployment rate is expected to be positive. The higher the unemployment rates, the higher the polarisation indicator is expected to be, as higher unemployment means worsened socioeconomic state of the region. The same explanation is expected for these three variables in the form of their development. If GDP and disposable income grow in comparison to previous values, political polarisation is expected to drop, and the opposite effect can be expected from the growth of unemployment. For the control variables, higher voter turnout increases political polarisation, as the more opinionated and motivated voters go to vote and it is mainly the extreme parties that benefit from that kind of movement (Benoit & Laver, 2006). Regions with a higher than average population also demonstrate the same result, higher population densities occur in regions with more urban development, where it is possible to expect less extreme political opinions (larger cities usually vote more moderately), a higher proportion of university-educated population will lead to a decrease in polarisation, as the university-educated tend not to agree with the ideas of the extreme right and left, and finally, a larger share of the outer age groups will lead to an increase in polarisation, as these age groups are prone to choose more extreme positions based on the benefits offered to them by the different parties (Dijkstra et al., 2020; Ford & Jennings, 2020; Gimpel et al., 2020). The expected impact of the sociological survey variables ESS (2023) on polarisation is as follows: *Stfdem*, *StfecO*, *Stfgov*, *Stflife*, and *Happy* are variables that represent a certain satisfaction in a given field with life in the Czech Republic. Political polarisation is an expression of disapproval with some fields of the population's life and therefore a negative relationship can be expected, where an increase in satisfaction with life in the Czech Republic will lead to a decrease in political polarisation (Dijkstra et al., 2020; McKay, 2019, Rodríguez-Pose, 2020; Greve et al., 2022; Zaid & Joshi, 2018). A similar relationship can be observed for the variables expressing trust; the more politicians and parliament are trusted by voters, the less political polarisation will occur. The *Rldgr* and *Imprtrad* variables are related to the degree of importance of religion and traditions, and are associated with conservative values. In the Czech Republic, parties that express these values are positioned on the left-right ideological spectrum, either at the middle of the spectrum or at its extremes (Döring & Manow, 2023), so it is not possible to say in general terms which parties voters holding these values will gravitate towards. Similarly, it is not possible to identify the expected influence of the variable representing the share of women in the population.

## Results and Discussion

From the results, we see that Model 3 and Model 4 (see Table 1 below) show the highest coefficients of determination, which include the variable disposable income (*Disp\\_income*). Each of the models exhibits the same problem with statistical testing, namely the data normality problem. This may be due to the low number of observations (126 observations).



**Table 1.** Estimation of regression models using the OLS method with fixed effects (time and region fixed effects) - influence on political polarisation.

Variable	Model 1	Model 2	Model 3	Model 4
Const	6,70343 (1,089)	7,85003 (1,264)	9,01008* (1,882)	9,11026* (1,907)
GDP	0,334396* (1,920)	-	-	-
Unemp	-0,00356383 (-0,7538)	-0,00349927 (-0,7299)	-	-
Disp_income	-0,469358** (-2,199)	-0,196631 (-1,217)	-	-
GDP_develop	-	-	-0,0518757 (-0,8122)	-
Unemp_develop	-	-	0,00661725* (1,929)	0,00686384** (2,013)
Disp_income_develop	-	-	-0,195612** (-2,023)	-0,229550*** (-2,638)
Turnout	0,00616358*** (3,075)	0,00550412*** (2,748)	-0,00182312 (-1,004)	-0,00168530 (-0,9342)
Av_pop	-1,09740 (-1,495)	-0,909658 (-1,233)	-0,875685 (-1,392)	-0,913406 (-1,459)
Dens	0,000166352 (0,4398)	0,000218516 (0,5713)	-0,000109608 (-0,4360)	-7,57760e-05 (-0,3063)
University	-0,0170943*** (-2,631)	-0,0176829*** (-2,687)	0,0152840** (2,566)	0,0160707*** (2,739)
Outer_age	0,000205401 (0,01896)	0,00792419 (0,7768)	0,00894800 (0,6360)	0,00928876 (0,6618)
Women_share	4,41711 (0,5872)	0,409646 (0,05590)	-3,49971 (-0,8187)	-3,35637 (-0,7874)
Stfdem	0,0622790** (2,613)	0,0615311** (2,546)	-0,0345845** (-2,266)	-0,0344754** (-2,263)
Stfecoc	-0,110006*** (-5,508)	-0,118618*** (-6,010)	0,0322638* (1,704)	0,0314828* (1,668)
Stfgov	-0,00103530 (-0,03335)	0,00982965 (0,3176)	-0,0145998 (-0,8102)	-0,0132040 (-0,7375)
Stflife	0,0990676** (2,364)	0,106320** (2,512)	0,00905393 (0,3317)	0,00864203 (0,3173)
Trstplt	0,0573810* (1,874)	0,0615970** (1,989)	0,0620384*** (3,529)	0,0623108*** (3,552)
Trstprl	-0,0521656 (-1,492)	-0,0651234* (-1,872)	-0,0383068* (-1,823)	-0,0379054* (-1,808)
Happy	-0,102808*** (-2,660)	-0,105831*** (-2,703)	0,00306793 (0,1294)	0,00108303 (0,04600)
Rlgdgr	-0,0167139 (-0,9737)	-0,0164654 (-0,9460)	-0,0147352 (-1,465)	-0,0144964 (-1,444)
Imprad	0,0281389 (0,7366)	0,0325788 (0,8426)	0,0571711** (2,515)	0,0578570** (2,552)
Time-fixed effects: year	no	no	yes	yes
Region-fixed effects	yes	yes	yes	yes
LSDV R <sup>2</sup>	0,867024	0,861812	0,962576	0,962289
Within R <sup>2</sup>	0,849304	0,843398	0,957589	0,957264

**Source:** The Czech Statistical Office (2023), European Social Survey (2023), and Döring & Manow (2023).

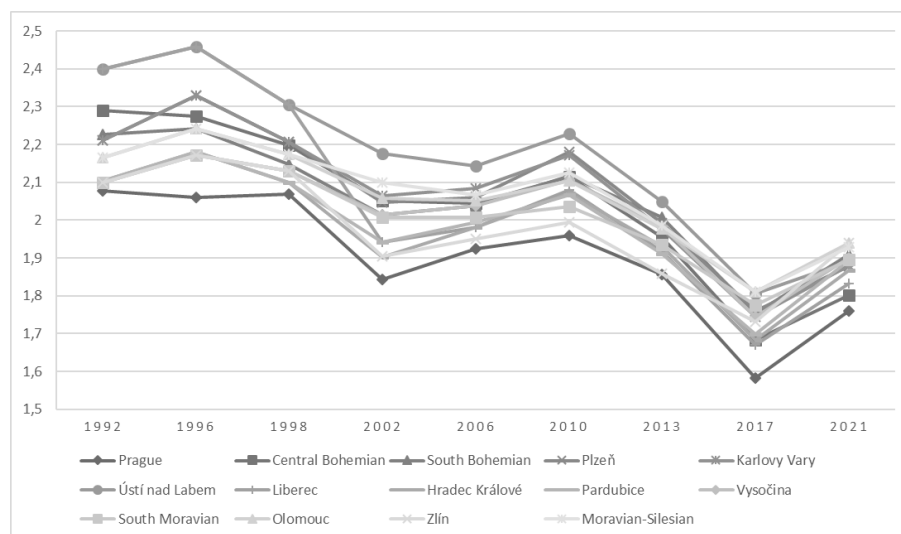
**Note:** For each model: 126 observations; 14 cross-sectional units, length of time series: 9. \*, \*\*, and \*\*\* denote significance levels of 10%, 5%, and 1%; t-statistics are reported in parentheses below the coefficient.

Model 4 is chosen as the final model, although it does not show the highest coefficients of determination. This is due to the multicollinearity of the variables GDP and disposable income, which are based on a similar basis, and it is preferable to use a model where these variables do not operate simultaneously. This also applies to their expression in growth form. Instead of using the share of the outer age groups, the share of the 65+ age group alone was also tested. This, however, can be problematic in the Czech Republic; the older population tends to choose populist parties, whose position on the left-right spectrum cannot be properly identified, as they are positioned in the central positions of the ideological spectrum. This variable was eliminated after a Q-Q graph check, which showed an error in the data. Due to this issue, the models were tested with and without the *Outer\_age* variable.

It is possible to confirm the dependence of political polarisation on the economic well-being of a region if economic well-being is defined as the growth of disposable income of households and the rate of unemployment. These results followed the research of Sacks et al. (2010), whose research confirmed a connection between higher disposable incomes and subjective indicators such as happiness and satisfaction with life, but also with economic well-being (it has a slightly different definition in his research). Fuentes & Rojas (2001), Diener & Biswas (2002), and Kahneman & Deaton (2010) developed the idea of connecting disposable income with economic well-being and the satisfaction of basic needs. Failing to satisfy basic needs leads to lower economic well-being (which is defined from a subjective point of view, rather than based on objective economic data). The gross domestic product is only significant in Model 1 but only at the 10% level of significance.

Regarding the chosen model, Model 4, polarisation is thus negatively affected by disposable income, an increase in the growth of disposable income between observed periods leads to a decrease in the political polarisation index. An increase in the growth of unemployment leads to an increase in the political polarisation index. These influences correspond to the theory given that political polarisation depends on the economic development of countries and regions (Bettarelli & Van Haute, 2022; Dijkstra et al., 2020; Mian et al., 2014; Ayiar & Ebeke, 2020; Grechyna, 2016, Acosta et al., 2020).

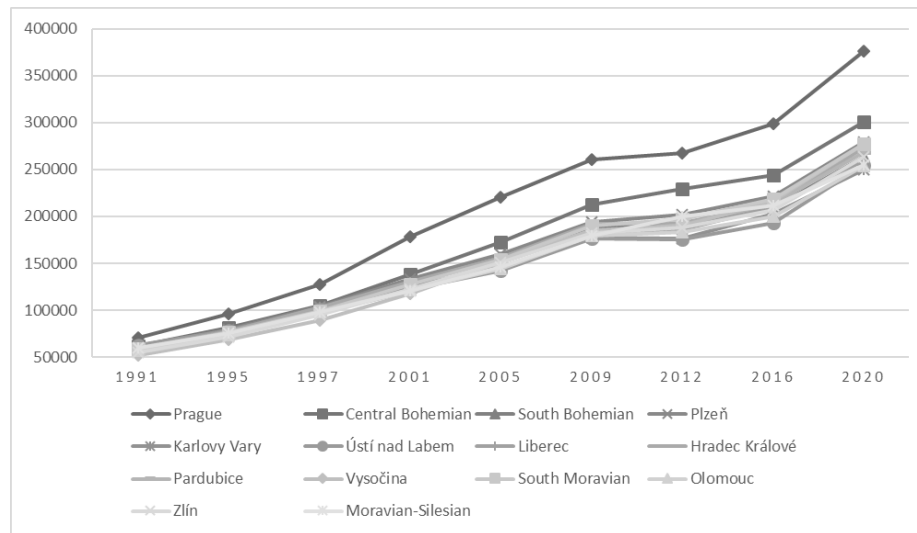
As for the control variables of the chosen model, variable *University* brings quite surprising results. An increase in the share of the university-educated population leads to an increase in political polarisation. This can be possible as the educated population separates itself in opinion from the mainstream and votes for parties that may be more pronounced on specific issues. Furthermore, according to Willeck & Mendelberg (2022), education affects political attitudes in different ways, not only according to the level of education but mainly according to the type of education, and thus it is not possible to predict in advance how it will relate to political polarisation based on mere information about university education. According to Weakliem (2002), a higher education level has a positive effect on the amplification of liberal views of a given population. This may increase polarisation, with the most liberal parties positioning themselves closer to the extreme of the left-right political spectrum. At the same time, higher education levels have the effect of increasing support for left-wing economic attitudes (Weakliem, 2002). Furthermore, the significant control variables are *Stfdem*, *Trstplt*, *Imprad* with *Stfeco* and *Trstprl* which are significant only at the 10% significance level. The control variable *Stfdem* expresses satisfaction with the level of democracy in the Czech Republic. If the variable values increase, the polarisation level decreases. This is expected, when a society is satisfied with the functioning of democracy in the state, it has no reason to vote for change and tends towards centrist, more moderate parties.



**Fig. 1.** Development of the polarisation index created (dependent variable) for the regions of the Czech Republic for the election years 1992 to 2021, dimensionless variable.

**Source:** ParlGov project database (Döring & Manow, 2023); own processing.

The results for the *Trstplt* and *Trstplr* variables are interesting. An increase in trust in politicians leads to an increase in political polarisation, while an increase in trust in parliament leads to a decrease in political polarisation. For the variable of trust in parliament, this result is logical, as citizens trust in its functionality and the set institutional rules, and thus have no reason to vote more polarised to bring about a change in this situation. Trust in politicians in general can lead to polarisation, since if voters are unable to distinguish the credibility of the policies presented by these politicians across the spectrum, including parties of extremes, voters are not afraid of a more polarised election. If voters trust that the promises of the politicians are well-founded and feasible and thus do not address the question of whether these are harmful to democracy, the economy, etc. Thus, they may also vote for politicians representing significant changes to the democratic setup of the republic and increase the polarisation of the left-right spectrum. The *Imptrad* variable represents the importance of traditions and customs. As a rule, this rhetoric is used by the more extreme parties that want to reintroduce the old orders and traditions and position themselves closer to the extremes of the left-right spectrum in the Czech Republic, increasing political polarisation when these are elected.



**Fig. 2.** Development of net disposable income per capita (one of the explanatory variables) in CZK in the Czech Republic regions one year before the election years 1992 to 2021.

**Source:** Czech Statistical Office (2023); own processing.

The results of the paper provide new findings in the analysis of political polarisation concerning the economic environment of the Czech Republic, and it is appropriate to extend it in the future to examine other countries, whether at a regional level (which will be more accurate according to the specifics of the society of any given state) or on a larger sample of countries at the state level to obtain a more robust, larger sample of observations. At the same time, despite the convincing results of the economic indicators used, it would be appropriate to try other available indicators, even though similar literature has encountered a lack of availability of detailed economic data (as in the case of this paper, examining the post-communist Czech Republic).

Some reservations about the results must be made. It might be said that economic well-being was not properly defined, as can be seen in the potential problems with multicollinearity between GDP and disposable income. The problem lies in the fact that disposable income is partly contained in GDP and only one of these variables should have been used. Furthermore, the results could become more accurate with the inclusion of income inequality indexes in the definition of economic well-being at a regional level (they were not available for the period under study).

## Conclusion

The paper confirms that the socioeconomic situation of regions influences voters' decisions. The impact of the development of disposable income and unemployment on political polarisation (representing economic well-being defined in this paper) has been confirmed, thus demonstrating the link between political polarisation and the economic well-being of the regions of the Czech Republic since its creation in 1993. The relationship between economic well-being and political polarisation suggests that lower levels of regional economic well-being are associated with increased levels of regional political polarisation. Polarisation in a region on this basis can arise both because of the perception of relative wealth to other regions by the region's citizens (Dijkstra et al., 2020; McKay, 2019; Maxwell, 2020) and because of the perception of one's economic well-being (Večerník, 2015; Xiao, 2015; Dynan & Scheiner, 2018; Han, 2015). The degree of political polarisation is influenced by many factors, which may not only be related to economic aspects, but are also influenced by, for example, the institutional environment, the historical development of the country, and traditions (as we see through the influence of sociological and sociodemographic control variables, where education, satisfaction with life in the country, and its

institutions are involved). It is not the ambition of this paper to assess the precise extent or strength of these influences. That is beyond the economic scope of this paper.

The findings correspond to the theory of political cycles, as it is possible that the political establishment may seek to stimulate the economy in order to be re-elected. This alternative way of analysing the reactions of voters to the previous performance of political representation might be an interesting topic for further research into the theory of political cycles, as through polarisation it is possible to observe the irrational reaction of voters to the extremes of the spectrum, depending on their agendas, statements, or short-sighted fiscal decisions, regardless of their qualifications and previously responsible governance. A suitable topic for further research into the theory of political cycles could be based on the polarisation index, but using data from the Manifesto project (Lehmann et al., 2022), which instead of using a static left-right division of parties introduced a separate evaluation of the position on the spectrum for each election, according to their election manifesto.

This paper differs from the rest of the literature by using a self-created polarisation index that can be comparably used at different levels of regions, but also on different samples of states. At the same time, it extends the small body of literature dealing with the Czech Republic in this context and, almost uniquely, at the level of NUTS 3 regions.

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