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## Clustering of Polish Citizens on the Bases of Their Support for Leaving and Remaining the European Union

Abstract: The article presents the clustering of Polish citizens based on the empirical dimension of support for European integration. The structure of the work is based on three key elements constituting the basis of the presented text. The first refers to the development of a scale to measure the extent of support for the integration of Poland with the EU. The second element covers an area of support scale modelling. After the substantial and statistical analysis of the adequacy of the probability distribution for the support scale, it was decided that a model in which the scale underwent mixing non-standard Beta distributions would be adopted. Applying the Maximal Likelihood Method (ML), the components for its fitted probability densities and estimators of prior (or mixing) probabilities were indicated. The procedure allowed us to define the clusters of which the population of voters was composed. The paper's final section presents many practical and theoretical conclusions for political parties and scientists interested in the discussed area. The novelty of applying the ML method goes hand in hand with the findings that previously appeared in political science literature, although under different economic and geopolitical conditions.

**Keywords:** Brexit, Polexit, Poland, EU fragmentation, Euroscepticism, EU support social components, mixing distributions

#### Introduction

After the period of its great enlargement in 2004, the fragmentation of Europe became a challenge and partially an actualisation as a result of Brexit. Leaving the EU by Great Britain led to the formalisation of the first-ever in history unequivocal process of the EU disintegration that had already divided British public opinion and manifested in tension observed between London and Brussels. It seems that the architects of withdrawing the UK from the EU have already achieved most of their popularity and highest political positions. When the anti-EU elite led to the exit from the EU, the country, which had been so far politically stable, turned out to be highly unsteady and chimerical. The public opinion survey run among British citizens on the EU before its great enlargement indicated a significant advantage of the support for the EU membership. There are considerable amounts of data available from the official EU sources, governments of the EU member states, and think tanks that indicate the evolution of attitudes toward the EU and the level of Euro-scepticism before and after the date of the British referendum. For example, the survey presented by the British Social Attitudes Survey no. 34 (2016), based on the data analysis provided by the British Election Study, synthesises changes observed in the attitudes of British citizens toward the EU over the past 15 years. They indicate a constant increase in the support of the UK society for leaving the EU, from 10% in 1992 to 41% in 2016. It reflects the constant growth of Euroscepticism. On the other hand, a survey provided by the Eurobarometer and commissioned by the European Parliament (in the spring of 2019) indicates that citizens of the EU member countries express considerable support for integration with the EU. However, when 68% of respondents in 27 EU countries believe that their countries have benefitted from their EU membership, a considerably growing percentage of EU citizens (27% of all, with the growth observed in 19 member countries) express their ambivalent attitudes toward the EU, considering their membership to be neither good nor bad. The estimated levels of support for staying in the EU recorded in the particular countries range from 86% in Luxembourg to only 40% in Hungary, 36% in Italy and 33% in the Czech Republic. Poland is in the middle, with 68% of support for its EU membership. The political intrigues inside the Conservative Party during David Cameron's term of office led him to a decision about the formulation of - as he believed - an ultimatum to the anti-EU faction, the announcement and organisation of a referendum on the EU membership of the UK. The political elites must have counted on the society to vote for staying in the EU and, in this way, to reinforce the advantage inside the Conservative Party. It happened otherwise, and David Cameron's government fell. The Conservatives still dominated the British political scene by winning the elections twice. However, their advantage in the Parliament decreased each time, and after the double replacement of the Prime Minister in 2022, the surveys indicate their probable failure during the next election. Thus, the anti-European political speculations resulted unexpectedly in the UK leaving the EU and did not provide any permanent domination of the Conservatives in the UK. After the UK left the EU, nationalist critics of the EC became quiet for some

time and refrained from disseminating their opinions, waiting for the outcome of Brexit. However, even the lack of clear and surely dubious advantages for the UK did not result in any permanent change in the policy they had previously pursued. At present, nationalist and centrist slogans have gradually grown in strength. After the victory of the radical, right-wing Fratelli d'Italia party (the Brothers of Italy), Italy might join the Euro-sceptical choir, along with the Eurosceptical governments of Hungary and Poland. What happened after the exit of the UK from the EU comes as a warning against further fragmentation of Europe, both in terms of the EU itself and its particular member countries, as even the UK is not free from this threat, considering the independence demands posed by the Scottish nationalists. The paper comes as a continuation of the research studies on broadly understood reasons for European disintegration. It considers many publications presenting the research results on Brexit (Kaczorowska, 2016; Curtice, 2017; Diamond et al., 2018; O. Zaichuk & Y. Zaichuk, 2020). In order to develop criteria for the level of support for leaving the EU, the research analysis of the reasons for the minimal victory of the leave option in the referendum of 2016 in the UK was considered (Patel & Reh, 2016), along with research studies providing further analysis of reasons for Brexit and its consequences in the future (Clarke et al., 2017; Fiszer, 2017; Matti & Zhou, 2017; Arnarsson & Zoega, 2016; Barcik, 2018; Fetzer, 2019; Kaczorowska, 2016; Hubüner, 2020). Growing Euro-scepticism is not a new phenomenon (Torreblanca & Leonard, 2013; Usherwood & Startin, 2013) and has intensified with the growing popularity of the shallowing of the political discourse down to the level of populism, accompanied by the extreme right-wing agenda. Hence, it is not by accident that right-wing politicians, who might be now in opposition as Le Pen in France or the reign as Orban in Hungary, Kaczyński in Poland or Trump (2017–2021) outside Europe, have been acting in favour of EU disintegration (Fomina, 2019; Kozłowski, 2019). These tendencies of right-wing politicians have already joined a broader anti-global, nationalist trend described by numerous scientists (Ben-Ami, 2022; Bonikowski, 2016; Judis, 2016; Krugman, 2016; Ostiguy & Roberts, 2016; Goldston, 2018; Biskamp, 2019; Feldman, 2019).

Growing Euro-scepticism is shown by indicators of socio-demographic conditions and cultural, historical, political, economic and social values, reflecting popular attitudes toward the EU (Hooghe & Marks, 2005; 2007; Boomgaarden et al., 2011). It is shown in more summative terms by the EU exit index (Gastinger, 2021), measuring the probability of the impact exerted by social, economic and political factors on the exit from the EU in 2014-2019. The uncertain future of the EU's existence in its current formula is also discussed in numerous scientific studies (Marszałek-Kawa & Plecka, 2015, pp. 24–40; De Grauwe, 2016; Patel & Reh, 2016; De Vries, 2017; O'Rourke, 2017; Leruth et al., 2019; Fabbrini, 2020; Hadjimichalis, 2021). The leaders of the key EU member countries have also been searching for a new formula for its functioning, including Emanuel Macron, President of France (Staunton, 2022). Steady and permanent Euro-scepticism is perceived as an autonomous idea that negatively affects citizens' attitudes toward the current project of the European Community (De Vries, 2018). Hence, further fragmentation becomes more and more expected. An increase in

Euro-scepticism is also reflected in academic research studies focused on Poland (Buras, 2017; Betlej & Soler, 2022; Fomina, 2019; Kozłowski, 2019; Zalas-Kamińska, 2019; Cislak et al., 2020; Sweeney, 2020; Trosiak, 2020). In light of the openly confrontational policy pursued toward the EU by the Polish right-wing government and its palpable consequences (Hofelich, 2021; Shotter & Foy, 2021; Bayer, 2021), the question of the rule of law attracts the attention of not only Polish citizens but also of other members of the European Community. Despite the high level of support expressed by the Polish society for the EU membership that was recorded by numerous surveys of public opinion in Poland (Stankiewicz, 2016; Kantar, 2021) and indicated by high indices of the

Eurobarometer (European Union, 2021), the future of Poland in the EU does not seem so obvious. Furthermore, in relation to the weakening reputation of this country, the problem of the de-Europeanisation of Poland has already been discussed in the international arena (Buras, 2017). The role of the radical right-wing political elites in shaping public opinion also deserves attention (Norman, 2021; Rashkova, 2021; Sus & Hadeed, 2021) because, in a long-term perspective, it may weaken the current positive attitudes toward the EU and enlarge the group of people who support leaving the EU. Polish Euro-scepticism has been growing stronger (Duszczyk, 2018), putting the future of Poland in the EU in question (Szczerbiak, 2017; Barcik, 2018; Zalas-Kamińska, 2019; Cislak et al., 2020).

The obtained clusters have been analysed to create more effective political campaign strategies, consider the parties' ability to mobilise their electorate and explore the polarisation and radicalisation of political discourse (Downs, 1957; Jacobson, 2013; Sides & Hopkins, 2015; Stout, 2020).

# The Subject of the Research: Support of Polish Citizens for European Integration

The article presents non-traditional empirical methods of analysing the structure of support presented by the Polish society for leaving the EU. The authors not only discuss the question of the scope of support for remaining in or leaving the EU but also analyse in detail the size and configuration of the clusters in the population of Polish citizens. In the context of the presented research, the concept based on clustering is a promising idea, especially regarding the analysis of the migration of opinions between clusters in repeated studies. The authors asked for citizens' opinions on the European integration process. Respondents could argue in favour of deepening integration towards creating a supra-state structure or its opposite, i.e., seeking to dissolve the EU. At the same time, respondents could make a more nuanced choice, i.e., to leave the level of integration unchanged or to reduce the political dimension of integration.

## Support for the EU Membership

The theoretical framework for selecting the criteria for the *Support for the EU membership* dimension was based on research studies provided by numerous authors. In this way, a research scheme was created for the questions posed (Carey, 2002; Rohrschneider, 2002; Medrano, 2003; Brinegar et al., 2004; Hobolt, 2016; Duodu, 2018; Hobolt et al., 2021). The measure of attitudes toward EU membership was developed based on the key determinants identified in the literature for values and attitudes in economic factors, culture and identity, and political preferences.

- Considering economic factors, the research dimension was shaped in relation to
  evaluating the EU as a uniform market, the perceived individual and global economic advantages that resulted from the EU membership and threats from economic
  unification that might come from the EU.
- Considering culture and identity, the research dimension was shaped concerning the discrepancies in the meaning of the national identity versus the EU identity. The perception of threats from the EU toward national identity and culture brings this field into the debate on the growing role of identity politics.
- Considering values and attitudes, the research focused on analysing the respondents' internally conditioned need to identify their attitudes toward the EU in the aspect of emphasising plausible reasons for potential Polexit.
- The essence of the *Political preferences* dimension was to analyse political consumption through the prism of behaviour related to voting to leave the EU. At this point, the context of political support (or lack thereof) for the EU, institutional perception of the EU representation and its model of democracy were considered.

All of them were represented in questions where the respondents referred to: support-related issues in line with the scope of integration, the perceived economic impact of EU membership, satisfaction with EU democracy, uniformity of currency, EU funds, geopolitical security, EU funds in exchange for the rule of law. The respondents identified their preferred attitudes toward the particular assumed statements on the Pro-EU (a) vs Anti-EU(e) scale. The criteria for selecting the specific dimensions result from a discussion that can be observed in the public debate and also from the concept referring to the essence of the membership of a particular country in the political and economic community – the European Union.

## Integration

About such a broad issue as the attitude toward integration, the respondents could express their opinions on the fundamental dispute inside the EU that refers to the scope of farreaching political integration with the dichotomous opposition of the EU as the United States of Europe and open support for the dissolution of the EU. Moderate attitudes were

brought closer to extreme attitudes, and the political community was replaced by a notion of economic integration at the current level, with some modified accentuation. The *Perceived economic impact of the EU membership* criterion refers to the perception of economic advantages or threats resulting from EU membership. An observable civilisation leap that has been made within two decades since the accession of Poland to the EU is perceived through the prism of institutional EU membership. On the other hand, however, the dysfunctions of the systemic transformation processes are discussed along with their insufficient or inefficient mitigation attempted by EU institutions. Frequently referred to by the former opposition groups, which have now been in power for two terms since they won the election in 2015, the political slogan *Poland is in ruin* comes as a diagnosis of economic and social exclusion of alienated communities living in small towns and the country. The respondents opted between statements confirming huge economic advantages resulting from EU membership and threats coming with EU membership. The reference point was the confirmation of the positive attitude toward the civilisational breakthrough or its negation.

#### Satisfaction with EU Democracy

The institutional scope of EU democracy is a field of intellectual criticism expressed by scientists who analyse integration processes. The following issues are indicated, among others: elitism of the European model of democracy and a low level of democratic representation in shaping the EU executive bodies. The European Parliament is considered a representative entity, but regarding its relatively low prerogatives, for many people, this exception comes as an argument for a deficit of EU democracy. The respondents were given a chance to evaluate the support for the functioning of EU institutions and express their acceptance and recognition of the current solutions. They could indicate the inadequacy of the European Parliament or consider the discussed institutions to be inefficient or even non-democratic. Acceptance or non-acceptance of the European Union institutions can be a condition for favouring the EU, which is why this question arises.

## Currency

One of the commitments undertaken by Poland during the process of its accession to the EU was the adoption of the Euro as its currency. The discourse about the economic sovereignty of such an act and its relation to the political perception of state sovereignty come as fuel for varying views on this matter, fervently expressed by economists, politicians and, consequently, by numerous members of the general public. This aspect is also related to economic benefits observed more often by experts and to strong concerns expressed by many politicians. The respondents expressed their attitudes toward the EU, starting from immediate support for the Euro-currency as the official state currency through its safe adaptation to the financial circuits, expressing scepticism towards the Euro and its gradual

adoption and ending with its total rejection. The position within the framework of exiting the EU is conditioned by a feeling for the democratic structures of the EU. Respondents gave their opinion on the assessment of the EU organisational structures.

#### EU Funds

The criterion of EU funds was developed in relation to the left-wing and right-wing economic dimensions. The first is traditionally identified with the orientation toward the needs related to wealth redistribution, social justice, job security or broadly understood state interventionism. The right-wing dimension defines market liberties, economic deregulations, and higher labour market flexibility. The respondents could support a hypothetical increase in the European tax on the cohesion policy and the support to the developing EU regions. On the other hand, they were given a chance to support restricting the role of EU taxes and their distribution for social needs in the developing EU regions. Between these two extremes, there were also attitudes recognising the current role of the EU financial policy and some opposite views referring to its low efficiency.

#### Geopolitical Security

Before the full escalation of the Russian-Ukrainian war, the geopolitical security of the countries in Central and Eastern Europe was an important determinant for making their geostrategic choice of orientation toward integration with the West. The great enlargement of the EU by the countries in this region was preceded by their inclusion into the NATO structures, which was critical for their security. The differences in perceiving geopolitical security were related to evaluating the sufficiency of NATO membership and the economic and political integration within the EU. Considering the geopolitical aspect, the attitude toward the EU proved the willingness to intensify integration also because of the perceived security of the state in the international configuration. The respondents could express their trust in EU institutions, understood in terms of the wide range of state security, including military, energy and cybernetic security. The respondents declaring the opposite attitudes expressed opinions that identified the EU membership as a higher threat to themselves and the state. It was often identified with concerns related to terrorism, migration, fragmentation or disintegration. Moderate attitudes between the mentioned extremes referred exclusively to military threats or security.

## Rule of Law and Money/Funds in Exchange for the Rule of Law

Agreed upon in 1993 by the European Council, the Copenhagen criteria established the key pillars for the accession of Central and Eastern European countries to the EU. Those conditions reflected the pillars of the functioning of the European Community, and, at the

same time, the fulfilment of those conditions came as the *sine qua non* requirement for integration. Next to (1) securing the functioning of the market economy capable of handling competition pressure and market forces in the EU and also to (2) the capabilities to undertake commitments resulting from the EU membership, including compliance with the economic and political union (*acquis communautaire*), it was as much fundamental (3) as it is now apparently undermined – stability of institutions that guarantee democracy, the rule of law, human rights, respect, and protection of minorities. The debate critical to the cohesion of the EU revolves around the last pillar listed above. The coming into power of the right-wing populist government in Hungary (2010) and Poland (2015) became a turning point or a U-turn in political freedom transformation in these countries.

The leaders' summit in December 2020 resulted in some agreements on the rule-oflaw mechanism. In this way, the heads of the particular EU countries agreed to meet the specific obligations related to reforms in their countries and, *de facto*, to start disbursements of EU funds dependent on that condition. The objections of Hungary and Poland were also considered, and the guidelines defining the use of the discussed mechanisms were implemented. After their implementation, the heads of the governments of those two and other EU countries accepted the rule-of-law mechanism. As it turned out, the mechanism itself did not contribute to the reforms expected in the areas specified by the European Commission. Instead, it provided space for exacerbating the conflict between the two mentioned governments and EU institutions. It also generated a problem, and some targeted EU scapegoating by the political parties forming those governments and the dependent media. The opposition groups and discriminated judges in Poland criticised EU institutions for their insufficient response or even stoical passiveness in the face of the obvious violations of the rule of law. As a result, restrictions imposed by the governments mentioned previously on the rule of law persisted and divided public opinion. The respondents faced the dilemma of whether to accept the mechanism of obtaining EU funds, fully respecting EU legal principles or reject the EU and its dependence mechanisms. The respondents representing moderate attitudes accepted the role of EU institutions in controlling the rule of law in the EU member countries to various extents. Respondents addressed the issue of supporting a conditionality mechanism for receiving EU funding linked to respect for EU legal principles. The question was asked because the issue of the EU finance conditionality and its member states' independence of the judiciary is a current topic in the public debate. As this issue can directly shape public opinion on the EU, such a question was asked.

#### Research Protocol

The research survey was conducted on a Polish nationwide stratified sample, including 1517 respondents, on December 7–14, 2021. The survey was conducted in cooperation with PBS Ltd, a research company, using the CAWI (Computer-Assisted Web Interview) under the ES-OMAR (European Society for Opinion and Marketing Research) standards. A random

sample of respondents was prepared, keeping quota shares of gender, education, age, regionalisation, and size of place of residence. Therefore, the descriptive characteristics are consistent with the distribution of these characteristics in the adult Polish population. In addition, the survey obtained information on respondents' household size, type of employment, income and participation in parliamentary and presidential voting. Due to the paucity of space, the detailed study results are not presented in this paper.

The initial research material consisted of the respondents' answers recorded as qualitative results. The raw data underwent a lot of processing in terms of their categorisation and classification to establish the research scales corresponding to the research subject. The article focuses on one of the problems observed during the research: the scope of support for European integration.

Eight survey questions were developed based on the criteria specified in Section 2. Each question identified the level of acceptance or disapproval referring to its particular scope. The respondents had to answer the questions using the Likert 5-point scale, in which the answers were descriptive. The answers were marked with (a), (b), (c), (d) and (e) letters, and the choice of the answer was coded in a numerical way as -2, -1, 0, 1 or 2, depending on the selected answer. The numerical values corresponding to the mentioned scales were summed up and standardised to the range from -2 points to 2 points. As a result of this procedure, each respondent provided their opinions within the range of -2 points up to 2 points. This procedure allowed the authors to move from the reasoning based on the frequency of the occurrence of answers from (a) to (e) to the reasoning based on the numerical values<sup>1</sup>.

## Discussion. Classification Based on the Components and Clustering

Respondents are usually divided into sub-groups (clusters) when analysing the results obtained from the survey measurements. Such methods are based on proximity (similarity) between respondents or groups of respondents. If the answers provided by two respondents are identical or similar, they are classified into the same class, and further procedures are sequential. If there is a partial configuration of clusters, every next respondent joins one of the current clusters or starts forming a new cluster. The core of that procedure is to identify respondents grouped in the clusters. Usually, cluster procedures do not refer to the frequency of the event occurrence, and in this sense, they should be placed with methods applied in descriptive statistics. This approach is close to the methods of Tukey's exploratory data analysis (EDA) (Tukey, 1977).

Quite different assumptions underlie a method based on the mixing procedures. First, modelling is based on analysing likelihood distribution and estimating its parameters. It means that we can include them in the group of methods applied in confirmatory data analysis (CDA). During the procedure, it is not defined which elements belong to which

<sup>&</sup>lt;sup>1</sup> For consistency, further details of the methodological overview have been moved to Section 6.

clusters, but an attempt is made to maximise opportunities for the occurrence of a particular cluster structure of the analysed random value.

A very elegant, intuitional and explicit approach is the reference to simulation. If, as a result of the mixing method application, it has been determined that the density of the likelihood of the support value consists of three components in the proportions 0.13, 0.8 and 0.07, it means that 13% of the respondents provide their answers according to the distribution of the first component, 80% of the respondents provide their answers according to the distribution of the second component and 7% of the respondents provide their answers according to the distribution of the third component.

Unfortunately, it is impossible to identify the respondents, that is: it is impossible to identify the class but it is also certain that this latent class is among the respondents. If the research aims to analyse the structure of the research value, not the division of respondent groups, a highly efficient and effective tool is obtained to analyse the structure of those values.

Another highly favourable characteristic of the mixing method is the abandonment of ubiquitous and inadequate procedures based on the Gaussian distribution (mean square procedures). As it is commonly known, variables analysed in political science research are very often characterised by significant occurrences of extreme opinions that cannot be ignored. However, at the same time, it is difficult to incorporate them into a homogenous form of probability density. Usually, using various heuristic methods, we sublimate those respondents, and their research opinions are analysed separately. The detailed study on the application of finite mixture distributions is discussed in numerous monographs (Lindsay, 1995; Dankmar, 1999; MacLahlan & Peel, 2000; Aitkin et al., 2009; Stasinopoulos et al., 2017).

In the analysis of the mixing distributions, the separation of the zero-altered or zero-inflated densities is quite popular. Among the procedures applied in this research study, the authors use the Beta distributions without separating extreme values. The model of the support scale consists of three components of the non-standard Beta distributions with the parameters presented in Table 1 and Figure 1. In this way, the density of the scale is given with an equation

$$f(x) = 0.13f_1(x) + 0.8f_2(x) + 0.07f_3(x), \quad (1)$$

where  $x \in (-2,2)$  and density  $f(\cdot)$ ,  $i \in \{1,2,3\}$  are the densities of the nonstandard Beta distributions. The details of the Beta distributions and the mixing method are described in Appendix.

A collective opinion of the Polish society is presented in a histogram in Figure 1-A. The histogram is far from the Gaussian bell curve. Particularly, it is possible to observe too high frequencies near the extreme scale values (Anti- and Pro-EU), significant right skewness and a fairly large fraction near zero. The same characteristic is presented in the chart of the density estimator of the support scale, marked in red in Figure 1-A. The curve of the density estimator comes as a linear combination of densities displayed in Figures 1-B, 1-C, and 1-D with the coefficients 0.13, 0.8 and 0.07.

0.84

0.12

0.199

0.03

0.8

0.07

The chart in Figure 1-C corresponds to the main group accounting for over 80% of the Polish society expressing their opinion on EU support. The group Table 1: The density parameters of the support scale components

Component —	Density parameters		11	Standard	C 1	Dl.
	р	q	Mean	deviation	Gmd	Prob
<i>f</i> Su.1 (⋅)	0.5	0.4	0.05	1.44	0.403	0.13

0.42

-0.01

Table 1. The density parameters of the support scale components

1.7

173.6

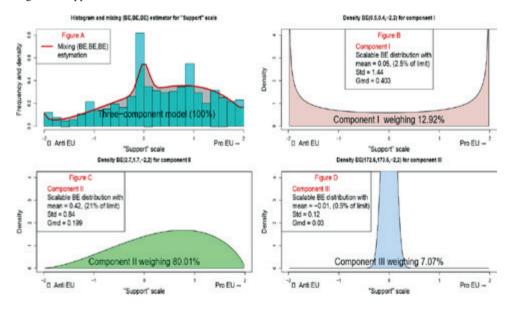
Figure 1. Support scale model

2.7

172.6

fSu.2 (⋅)

fSu.3 (·)



The respondents who express their opinions under that density support the EU (mean = 0.42). The standard variation is Std = 0.84 and is not very high (the coefficient of variation is V = 2). It is possible to state that it is the natural main group of the society.

An equally natural group consists of over 7% of the respondents whose opinions are presented per the density in Figure 1-D. It is a group of respondents who are indifferent to the discussed problem. The expected value of the probability density mean = -0.01, and the dispersion is very low (Std = 0.12).

The chart in Figure 1-B presents opinions provided by the respondents with extreme attitudes. The entire group comprises almost 13% of society and is characterised by balanced extremities. The parameters' values referring to this group's density reflect the respondents' balance. The expected value is mean = 0.05, and the standard deviation is considerable

(Std = 1.44). The configuration of the respondents precisely defines the attitude toward the support for the EU and debunks populist myths on the size of the latent classes. For example, it cannot be stated that society is polarised, and such polarisation cannot be eliminated. Indeed, polarisation can be observed, but its values are comparable, and they jointly account for less than 13%.

## The Main Component (Figure 1-A)

The support of the Polish society for EU membership has been maintained at a high level since the accession of Poland to the European Community. During the accession referendum, the turnout reached 59%; 77% of voters were for joining the EU, and 23% were against – mainly people from Poland's south-eastern and eastern regions. Carried out by various Polish public opinion research institutions or commissioned by EU institutions, the subsequent surveys indicated the support for Polish membership in the EU at the level of 80%. Hence, a high expected value and the median of the main component at 80% are not surprising. The support of society for the EU membership is largely non-political. It does not mean, however, that the political parties do not discuss the attitude toward EU institutions or the policy pursued toward the EU.

The mainstream opposition parties, such as Platforma Obywatelska (PO; the Civic Platform, later enlarged by some smaller groups and transformed into the Civic Coalition – KO), left-wing parties and PSL (Polish People's Party) who often supports them, definitely support the EU membership. The largest government party PIS (Law and Justice) assumes a wide range of attitudes toward the EU. However, it has been increasingly expressing criticism or even hostility toward the EU, following the example of its coalition partner, Solidarna Polska (United Poland), without whom it would lose the majority in the Sejm, losing also the possibility to govern the country. Nevertheless, the PIS voters are largely the main component that supports the EU membership. The situation is different with voters supporting United Poland and Konfederacja RP (Confederation RP) – the opposition group with high capabilities to form a coalition with PIS. The electorates of these two radically right-wing parties develop their political communication strategies largely based on hostility expressed toward EU institutions.

In their electoral mass communication, the political strategies pursued by the two largest political parties, namely KO and PIS, do not emphasise their attitudes toward the EU, focusing attention on other current issues. In this way, KO has surrendered to the popularity of identity politics that has dominated the Polish political scene over the past several years, accompanied by the populism of the radical right-wing parties. Having neither courage nor ideas for confrontation, the party has been focusing on the issues generated by the right-wing that polarise society. Having provided the right social diagnosis, PIS has based its communication strategy on exploring social polarisation, which has already been tried out in the United States of America and Great Britain.

Jacobson (2013, pp. 691–694) indicates the growing role of ideology among voters participating in the American elections (since the 1970s), who choose to stand on one of the sides of the increasingly polarised political scene. When faced with the radicalisation of political activists, moderate and centre attitudes remain unnoticed and have no influence on the functioning of the party and also on public life. Political parties in the UK rely their communication on ideologically engaged party members. People of moderate views leave politics, giving way to more determined and active people who represent more radical attitudes. The centre party, which the Liberal Democrats tried to be in the UK, quickly lost their supporters in the polarised political scene of the country. After it joined the right-wing Conservatives, the party lost 60% of its members during the first year of joint rule, and during the next election, it fell out of the game where participating in governing was at stake (Sides & Hopkins, 2015, pp. 128–129). Considering this aspect, the problem of the attitude toward the EU is inconvenient for PIS because it does not divide society deeply enough. Those Poles who do not support the EU membership or they do not support it "very much", are a minority group. For the mass party looking for its electorate in its rivalry with the opposition parties (KO, the left-wing, PLS), it does not provide the mobilisation potential strong enough to play that card.

Although it indicates well-established majority support of the Polish society for the EU, the main component does not mean that this support will last, even though it has been maintained so far. Antony Downs's *Economic Theory of Democracy* (Downs, 1957), has lost its relevance as a political strategy that rewards candidates for becoming similar to the majority in the electorate. It is proved by an increase in orientation toward social polarisation in the United States and by copying this model in some European countries, as it was demonstrated during George W. Bush's campaigns of 2000 and 2004 designed under Karl Rove's concept. He theorised that the best way to Bush's victory was to mobilise conservative voters and restore Christians. Internet technologies and content targeting that properly unified the electorate around the polarising issues became communication tools. The electoral campaign was reinforced during the period before the presidential election of 2004 by mobilisation of voters around the issue of banning same-sex marriages. Mobilising own voters was more efficient than appealing to the moderate electorate (Stout, 2020).

## The Polarisation Component (Figure 1-B)

In the United States of America and Great Britain, it is indicated that the orientation toward polarisation and mobilisation of the electorate results from the reduction in the number of centrist voters. Polarisation has led to a bimodal distribution with two sets of large groups of voters at the poles of the spectrum. Additionally, these sets of voters are relatively equal in size, so no group has a natural advantage. Candidates who move to the centre risk alienating voters in their parties, with a low likelihood of altering voters' opinions from the other side (Stout, 2020, pp. 55–56).

In Poland, the polarisation potential of the attitude toward the EU is very low because both extreme streams jointly account for not more than 13%, and they are equally distributed into approximately 6% on both sides. However, this level is high enough to appear in the political communication of some politicians who would count on mobilising their electorates and gaining more voters in the polarising centre. Considering Polish politicians and their attitudes toward the EU, United Poland, the co-governing party, has considerably discussed this issue. That group declares a hostile attitude toward the EU, which is a distinguishing feature in shaping its political programme. Although United Poland gets some marginal support (1%-2%), the party does not change its strongly negative attitude toward EU institutions, counting on triggering similar emotions before the next electoral campaign and focusing on issues particularly important for its electorate. It competes with the Confederation RP, which oscillates on the verge of the electoral threshold, identified as a singular party in Poland at 5%. This party expands its polarisation arsenal with other issues significant to its extreme right-wing electorate, such as a negative attitude toward migrants, including refugees seeking shelter from the war in Ukraine.

Anti-EU politicians and both above-mentioned anti-EU parties have been probably counting on consuming radicalism, following the American model where candidates who use racist slogans may be rewarded with a more mobilised electorate without sacrificing the support provided by centrist voters who have largely selected their side (Stout, 2020, p. 55). The persistence of polarisation comes as a threat to democracy in general but will not change the attitude represented by the main component of Polish society toward EU membership. Hence, the authors believe that a considerable shift cannot be expected in the opinion on the analysed question, namely: on Polish citizens' attitudes toward a further commitment to the EU integration and despite a growing conflict between the Polish government and EU institutions on the disbursement of EU budget funds for Poland. Although it is highly significant to the Polish state budget and numerous investments already announced, the issue is neither particularly important to nor properly understood by the society because it does not find any vent in a mass social reaction, except for a fervent discussion between experts and politicians.

## The Neutral Component (Figure 1-D)

Social polarisation and radicalisation research in some selected Western countries indicate decreasing groups of people with independent ideological views. It has also been observed that tendencies to divert from one's preferred policy are decreasing, even if such a policy cannot be implemented. The tendency to modify one's own opinions has been weakening. Such behaviour has already found its terminology explanation as a concept of motivated reasoning (Taber & Lodge, 2006). The radicalisation of the political discourse reduces or eliminates reasons for any potential changes to political attitudes. People who define themselves as independent in their views from any political party, during elections, vote

according to their previously well-established ideological beliefs or their number is so low that they account for a very low percentage of the population – it is highly probable that they do not vote at all (Stout, 2020).

In Poland, it seems that the neutral component should not indicate any traits of motivated reasoning in relation to citizens' attitudes toward the EU, considering the large size of the main component – as described above – who supports the EU membership and is relatively low polarising. Still, it is possible to observe the marginal character of the phenomenon and considering the lack of any radicalising aspect, it can be explained with indifference to the discussed phenomenon. The indifference is explicitly lower here than in relation to other issues that divide society, such as abortion, LGBT communities, migrants and other categories that have been exploited to some very large extent by populist parties of the right-wing before important political elections. Considering the phenomenon of the neutral component, it should be stated that the Polish society members have well-established opinions and very few people indifferent in their attitudes toward the EU.

The considerations do not mean that the situation cannot be changed. The growing polarisation in Great Britain has resulted in increased social alienation from politics and politicians. It has been manifested by the decreasing turnout during the elections, falling trust toward politicians and falling numbers of political party members (Jacobson, 2013). Thus, Brexit took place as a direct consequence of rivalry inside the governing party of Conservatives, which organised a referendum on the attitude toward the EU membership where one ultimate question was fragmented into problems dividing the society. The social polarisation in Great Britain reached such a high level that the adequately developed electoral campaign supported by technological targeting tipped the scales of victory for the option of leaving the EU.

#### **Conclusions**

The support of the Polish society for EU membership at the level of 80% is perceived as large and non-political, making the current state stable. The discussed research indicates a large and permanent advantage of the main component, which expresses its support for EU integration. The research results show the potential of Poles' polarisation toward the EU-related issues as very low because both recognised extreme streams jointly account for not more than 13%, and they are equally distributed into approximately 6% on both sides. At the same time, it should be stressed that the level of polarisation of attitudes towards some EU integration processes seems to be exploited in the political communication of some politicians hoping to mobilise their electorates and win more voters in the polarising centre. In this context, continued polarisation threatens Polish democracy in general, although it will not change Poles' attitudes to EU membership in the short to medium term. The authors believe that no significant change in opinion is expected regarding the research question under consideration, namely: the attitudes of Polish citizens towards EU membership. Some

relatively inconsiderable polarisation on EU integration issues and very low neutrality suggest that politicians who support leaving the EU do not have any chance to implement such a process efficiently. However, the attitude toward the EU is not attractive enough to involve public opinion in the radicalising discourse. It is not because it is unimportant but because in the public discourse, other issues discussed by politicians are applied to antagonise and more efficiently polarise society. Indifference towards EU membership is noticeably less than about other issues that divide society, such as abortion, LGBT communities, migrants and other categories that populist parties have very much exploited.

## **Appendix**

#### Methodological Remarks

In the classical approach, the interpretation of opinion poll results is often based on treating the data collected as a fragment of the global population of respondents. In the field of political science, this approach is relatively popular and accepted. However, we increasingly often do not speak of a population and a sample from a population but treat the result of observation as a random value with a specific distribution with unknown parameters. This approach is applied in the presented article. Interpretation of the test results is then based on the analysis of the distribution parameters rather than on the descriptive values of the empirical characteristics of the results data. For this reason, it is impossible to provide descriptive characteristics of the respondents in the clusters obtained. However, based on the observations obtained, we argue that the global population is mainly composed of the indicated clusters. We can also give their fraction of occurrence (as clusters), and we can estimate descriptive characteristics in the specified clusters. This calculation method is given in Section 4.

The support for leaving and remaining on the European Union scale was assumed to be subject to a linear combination of three probability distribution Beta densities with unknown parameters (compare the Formula 1).

The selection of the probabilistic density adopted in the model is always subjective but supported by observing technical parameters and the coincidence of factual considerations. The substantive rationale was mainly concerned with the probabilistic density carrier and the global results of the qualitative observation of the stratification of the opinion of the scale analysed. The technical parameters also indicated that the choice of Beta distributions is the most appropriate in the class of distributions studied (Subsection *Execution procedure*).

In a simplified manner, the clustering procedure applied in this paper consists of considering all possible subdivisions of the results into subgroups and selecting the division with the highest reliability (ML method). An indispensable part of using this procedure is to determine the number of clusters. Many attempts at model construction have been carried out, and it appears that adopting a binary structure leads to a substantively unjustified

reduction of cluster C in favour of cluster D (see Figure 1). The parameters of technical adequacy also do not mandate this approach. In contrast, increasing the number of clusters increases the technical fit parameters, but firstly, the proportion of respondents in successive clusters is quite small (less than 1%), and the probabilistic distributions in these clusters deviate little from those already present.

This argumentation convinces us to treat the adopted model as well-established.

## **Definitions and Theorems**

**Definition 6.1 (Johnson et al., 1995, Ch. 25)** For given parameters p > 0, q > 0, a < b, the probability density

$$f(x) = \frac{1}{\beta(p,q)} \frac{(x-a)^{p-1}(b-x)^{q-1}}{(b-a)^{p+q-1}}, \quad x \in (a,b)$$

where the function  $\beta(t,s) = \frac{\Gamma(t)\Gamma(s)}{\Gamma(t+s)}$ , for t>0, s>0 is called the density of the

Beta distribution with parameters p, q on the interval (a,b).

A distribution with density  $f(\cdot)$  is called Beta distribution with parameters p, q, a, b, and we denote it Beta(p,q,a,b).

The standard form of the density of Beta distribution with parameters p > 0, q > 0, is given by the formula

$$f(x) = \frac{1}{\beta(p,q)}x^{p-1}1 - x^{q-1}, \quad x \in (0,1)$$

**Proposition 6.1** If the random variable  $\xi$  has the Beta distribution with parameters p, q, a, b, then the transformed random variable  $\eta = \frac{\xi - a}{b - a}$  has the standard Beta distribution with parameters p > 0, q > 0.

**Proposition 6.2** If the random variable  $\xi$  has the standard Beta distribution with parameters p > 0, q > 0 and a < b, then the transformed random variable  $\eta = a + (b - a)\xi$  has the Beta distribution with parameters p, q, a, b.

**Proposition 6.3** *If the random variable*  $\xi$  *has a standard Beta distribution with parameters* p *and q then the expected value and variance are given by the formula* 

$$\mathbb{E} \xi = \frac{p}{p+q}$$
,  $Var(\xi) = \frac{p q}{(p+q)^2 (p+q+1)}$ .

**Proposition 6.4** *If the random variable*  $\xi$  *has a standard Beta distribution and* 

$$E\xi = \mu$$
,  $Var(\xi) = \sigma^2$ ,

then the parameters p and q are given by formulas

$$p = \frac{\mu}{\sigma^2} S$$
,  $p = \frac{1-\mu}{\sigma^2} S$ ,

where  $S = \mu - \mu^2 - \sigma^2$ .

#### Definition 6.2 (Cifarelli & Regazzini, 1996; Yitzhaki & Schechtman, 2013)

Let  $F(\cdot)$  be a continuous distribution function satisfying the conditions F(x) = 0 for x < 0 and  $0 < \mu = \int_0^\infty x dF(x) < \infty$ . Gini's mean difference is the coefficient given by the

formula  $Gmd(F) = \frac{\triangle}{2\mu}$  where

$$\triangle = \int_{0}^{\infty} \int_{0}^{\infty} |x - y| dF(x) dF(y)$$

**Proposition 6.5** *If the distribution function*  $F_X(\cdot)$  *of random variables* X *satisfies the conditions of definition 6.2, then* 

$$\triangle = \int_{0}^{\infty} \int_{0}^{\infty} |x - y| dF_{X}(x) dF_{X}(y) = 2 \int_{0}^{\infty} F_{X}(x) (1 - F_{X}(x)) dx$$

#### Execution procedure

As a model in the support scale, a random variable was adopted, whose density is a linear combination of three Beta densities set in the range (-2,2) with unknown parameters p and q (cf. Definition 6.1) and unknown combination coefficients. At least two indications should be mentioned among the arguments suggesting such an approach. The natural clue is that the support scale is limited to the range (-2,2).

The second one results from carrying out the distribution fitting procedure. For this purpose, the R language package gamlss (Generalised Additive Models for Location, Scale and Shape (Stasinopoulos et al., 2017)) was used. The gamlss::fitDist function with k=2, type='real0to1' arguments was used for the rescaling support scale (Proposition 6.1), and the Beta distribution was obtained as the optimal one based on the Global Deviance criterion.

The parameters of the components were obtained by applying the maximal likelihood method using the gamlss::gamlssMXfits function. As a result, estimators of *p* and *q* parameters for Beta distribution and coefficients of the linear combination given by formula 1 were obtained.

Calculations of expected values and standard deviations were based on parameter estimators *p* and *q* for Beta distributions (see 6.3) and not based on sample mean or sample variance.

Similarly, the Gini's concentration coefficients are calculated numerically from the formula in Proposition 6.5 for Beta distributions with the resulting parameter p and q estimators.

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