Zbigniew Chechliński[1]

THE EFFECTS OF THE HYPOTHETICAL IPLEMENTATION OF PREFERENTIAL VOTING METHODS IN POLAND ON THE POLISH POLITICAL STAGE AND NATIONAL INTEGRITY

Abstract:

One of the factors which foster political polarization of polish society is the D'Hondt voting method. Replacing it with the preferential methods – Instant Runoff Voting and Schulze methods would reduce the political polarization and thus increase the national integrity. The preferential methods would incentivise the political parties to use more conciliatory rhetoric. Instant Runoff Voting would encourage them to court for a vote of the moderate voters, instead of basing on their core electorates. In turn, the Schulze method would tend to advantage the most compromise parties and thus would discourage the politicians from using aggressive and confrontational rhetoric and strategies. Nonetheless, implementation of the new system would also create risks, especially in case of the Schulze methods, which was never applied in any country on the central level.

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[1] University of Essex, United Kingdom.

Introduction

National integrity is an essential states'asset. Unfortunately, in the second decade of the XXI century, the political polarization of Polish society intensified. National integrity is influenced by many factors, including historical, economic or religious. This article focuses on the role of institutions, particularly the voting systems. The paper analyses the influence of the hypothetical implementation of the preferential voting systems – IRV and the Schulze methods on the Polish domestic politics and the political discourse.

The topic of the voting systems was already raised in Geopolitical Review by Piotr L. Wilczyński. In his article "*Analiza wyników wyborów samorządowych w 2014 i prezydenckich z 2015 w świetle postulatów zmiany systemów wyborczych w Polsce*" he analyses the results of the elections in 2014 and 2015 from the point of view of the majority first-past-the-post, Single Transferable Vote and the mixed systems (Wilczyński, 2016). Also, in his article from 2019 "*Wybory Parlamentarne 2019 w świetle wybranych sposobów przeliczania głosów na mandaty poselskie*" he converts the results of the parliamentary elections in 2019 using he Sainte-Laguë and Hare-Nemeyer methods (Wilczyński, 2019). Those two articles include the

quantitative simulations, used to demonstrate the effects of converting the votes into mandates by different voting methods. Unfortunately, it is impossible to run a similar simulation in case of the Instant Runoff Voting and the Schulze methods without conducting precise field research. This situation is caused by the fact that the ballots used in the D'Hondt method (current voting method in Poland) differs significantly from those used in the preferential voting. For that reason, this article does not present the exact quantitative results but rather focuses on the general effects and long-run trends caused by the implementation of the preferential methods. The topic of preferential systems was raised by the Paul E. Johnson, (Johnson, 2005) Warren Smith (Smith, 2011), Rosa Camp, Xavier Mora and Laia Samuel (Capm, Mora, Samuel, 2008). Also, the problem of the Condorcet Paradox mentioned in the article was raised by Daniel Bochsler in his paper "Marquis de Condorcet goes to Bern" (Bochsler, 2010).Above all, the article is based on the paper "A new monotonic and clone-independent single-winner election method" written by the inventor of the Schulze method, Markus Schulze (Schulze, 2003).

In the first part, the paper describes the current voting systems, used in the parliamentary and presidential elections in Poland. Next, there is a description of the Polish political stage, so the main parties in Poland. Then the article proceeds to the most important part, so the description of the preferential systems and analysis. First, the paper describes the operating principle of the Instant Runoff Voting

and explains the concept of the Condorcet system. Then the article analyses the potential ceteris paribus results of the implementation of the IRV as a voting system in Poland. Next, the article proceeds to the analysis of the long-run implication of the implementation of the IRV. The next part, the essay focuses on the Schulze method. First, the essay describes the mechanism of this method. Then, it analyses the ceteris paribus effect of the implementation of the Schulze method as the voting system in Poland. Then, the paper analyses the long-run implication, again focusing on the issue of social integrity and polarization. The last part is the summary, which concludes the finding of the whole paper. The essay argues that hypothetical implementation of the IRV and the Schulze method would decrease the political polarization of society and thus positively affect the national integrity. However, that kind of institutional reforms could have some risk, especially in case of the Schulze method, which was never implemented by any country on the central level.

Political stage in Poland

<u>United Right</u>

United Right is an informal alliance of three conservative parties. The core is the Law and Justice – Christian-democratic, national conservative and statist party. The United Right also has the moderate and the radical wing. The first one is Agreement – socially conservative and economically liberal party. The second one – United

Poland is more explicitly conservative and statist than its larger sister, Law and Justice. United Right is softly eurosceptic, and all the three parties are the members of the European Conservatives and Reformists, where the United Right is the leading force. Since 2015 the coalition has an absolute majority in Sejm and thus rules the country. In the parliamentary election in 2019, the party received43.59% of votes. (PKW, 2019)United Right has the largest negative electorate, as 40% of respondent declare that they would never this group (CBOS, 2019).It is important to mention that such a high result is influenced by the fact that the United Right is a large and well-known fraction. The electorate of the United Rights is the most socially conservative, static and eurosceptic among all the parties (CBOS, 2019).

Civic Coalition

Civic Coalition is a big tent electoral alliance of centre to left-wing political parties. The main party in the alliance is the liberal Civic Platform, the member of the European Peoples' Party. The Civic Platform ruled Poland between 2007 and 2015 alongside the Polish Peoples Party. The Civic Coalition is also comprised of the classical liberal Modern (Alliance of Liberals and Democrats), social democratic and anticlerical Polish and the Greens (European Green Party). The Civic Coalition is strongly euroenthusiastic. The alliance received 27.40% of votes in the parliamentary election in 2019(PKW, 2019).Civic Platform, the main component of the Civic Coalition, has the largest negative electorate, as 37% of respondents declare that

they would never this party (CBOS, 2019). The electorate of the Civic Coalition is more economically liberal and significantly more socially progressive than the average for the population (CBOS, 2019). It is also the most euroenthusiastic among all electorates (CBOS, 2019). It is important to mention that the flows of electorates between the Civic Coalition and the United Right are marginal (IPSOS, 2019). Thus, it seems that the border between those two groups is, in fact, a trench between the two hostile camps.

The Left

The Left is the alliance of three left-wing parties: socialdemocratic, post-communist Democratic Left Alliance (Progressive Alliance of Socialist and Democrats); progressive and social liberal Spring (Progressive Alliance of Socialist and Democrats) and socialist Left Together (Democracy in Europe Movement 2025). This coalition is strongly euroenthusiastic and obtained 12.56% of votes in the parliamentary election in 2019. (PKW, 2019) Spring and Democratic Left Alliance have consequently 14% and 15% of the negative electorate (CBOS, 2019). This relatively low level of the negative electorate is influenced by the fact that those two parties are smaller and thus less recognizable than the main two parties. It is reasonable to expect that due to their relative radicalism The Left could, in fact, have a bigger share of the negative electorate, especially after increasing its recognizability in the election campaign 2019. The electorate of the Left is the most socially progressive among all

electorates (CBOS, 2019). It is also only slightly less euroenthusiastic than the electorate of the Civic Platform. Surprisingly, despite the social-democratic rhetoric of the Left, it is electorate is also more economically liberal than those of the Civic Coalition. (CBOS, 2019)

Polish Coalition

Polish Coalition is the alliance of the Polish Peoples' Party, Kukiz'15 movement and few other minor parties. The core of the alliance is the Polish Peoples' Party - Christian democratic and agrarian party, which traditionally played a role of the pragmatic bridge between the left-wing and the right-wing camps. Polish Peoples' Party formed a coalition government with Democratic Left Alliance in 1993 and with Civic Platform in 2007 and 2011. It is important to mention that by that time, the Civic Coalition was significantly more conservative than in 2019. It means that the Polish Peoples' Party was able to cooperate both with the Centre-left and the Centre-rights parties. The second biggest fraction in the Polish Coalition is the Kukiz'15 - an anti-establishment and conservative-liberal movement, which champions direct democracy and deep constitutional reform. Polish Coalition is euroenthusiastic but is more socially conservative than the Civic Coalition. Polish Coalition received 8.55% of votes in the parliamentary election in 2019. (PKW, 2019) Polish Peoples' Party and Kukiz'15 have consequently 5% and 10% of the negative electorate (CBOS, 2019). Similarly to the case of the Left, the actual negative electorate of the Polish Coalition could be potentially higher.

Nonetheless, it is reasonable to expect that it would be still significantly lower than in case of the Left, Civic Coalition and the United Right. In terms of social conservatism, economic liberalism and euro enthusiasm, the electorate of the Polish Coalition is in between the United Right and Civic Coalition. Interestingly, this electorate's views are very close to the average views of the whole population (CBOS, 2019). The primary alternative preference declared by the Kukiz'15 electorate is the United Right, while in case of the Polish People's Party it is the Civic Platform (now the fraction of the Civic Coalition). The above findings support the view, that the Polish Coalition stands in the centre of the political stage, between the main enemies – the United Right and the Civic Coalition.

Confederation Liberty and Independence

Confederation is the alliance of the paleolibertarian KORWiN with the national-catholic National Movement, reactionary Confederation of the Polish Crown and few other minor parties. Confederation champions free-market economy, social conservatism and traditional, catholic values. This eurosceptic party received 6.81% of votes in the parliamentary election in 2019. (PKW, 2019) KORWiN has relatively large negative electorate, as 18% of voters declare that they would never vote for this party (CBOS, 2019). The National Movement and the Crown were not included in the poll. It is reasonable to expect that overall the Confederation has large negative electorate. The voters of this right-wing alliance are slightly less

socially conservative and eurosceptic than the United Right supporters (CBOS, 2019). Remarkably, the Confederation has by far the most economically liberal electorate and no other electorate gets even close to the Confederation's enthusiasm toward the free-market. Due to the synthetic measure used in the research the distance between the Confederation and Civic Platform in terms of economic liberalism is almost 3.5 times larger than between the liberal Civic Platform and statist United Right. Thus, the Confederations electorate is remarkably more economically liberal than the United Right's electorate (CBOS, 2019). Surprisingly, the research on the preferences of the KORWiN's and National Movement's electorates implies that the Confederation's electorate would be more willing to vote for the United Right than for the Civic Platform (CBOS, 2019). This finding suggests that the economic views are not the leading indicator of the Poles' preferences and Polish domestic politics can be simplified to the one-dimensional spectrum, with socially conservative eurosceptics on one side and socially progressive euro enthusiasts on the other side.

Voting systems in Poland

Constitution of the Republic of Poland shapes Polish domestic politics since 1997. According to this document, Poland is a democratic country, with a strong position of the lower house of parliament – Sejm. There are three voting methods at the central level in Poland.

<u>Senate</u>

Senate elections are held using the majority, first-past-the-post system in 100 single-mandate districts (Kancelaria Senatu, 2010). The significance of the election systems was especially visible after the election in 2019 when the opposition block, comprised from the Civic Coalition, the Left and the Polish Coalition adjusted their strategy to the voting algorithm, which allowed them to win the majority in the Senate.

<u>President</u>

A presidential election is held using the absolute majority system. (Kancelaria Senatu, 2010) Polish presidents usually enjoy a high level of social trust and a relatively low level of the negative electorate. Notable, polish society traditionally has a more favourable opinion about the presidents, than about the parliament (CBOS, 2019). One of the reasons behind this situation is the voting algorithm - to win the election in the runoff the candidate needs to get more than 50% of votes to win the election. Thus, the candidates court for a vote of the moderate voters. The intuition behind this is explained in the example below:

Let's assume that in the hypothetical election, with the two candidates in the turnout – centre-left and centre-right candidate. The complexities of the political spectrum go beyond the simple right-left axis. However, in the sake of simplification, this example assumes that the political stage can be reduced to the pure, one-dimensional

spectrum. In this model, the centre-right candidate naturally expects to be supported in the runoff by his core, centre-right electorate, which voted for him in the first stage of the election. He also assumes to be supported by the more right-wing voters, who would naturally prefer to vote for him than for a centre-left candidate. A similar situation would occur in case of the centre-left candidate. Thus, in the turnout, the candidates focus court for a vote of the so-called "centre" voters to get over 50% of votes. Therefore, they need to use more moderate and conciliatory rhetoric to win the election. In the long-run, this feature promotes lowering the temperature of social discourse, what in turn decreases the polarization of society.

Sejm

The elections to the lower chamber of Polish parliament – Sejm are held using the proportional D'Hondt method in 460 multi-mandate districts (Kancelaria Senatu, 2010).

The D'Hondt method is a proportional system, which means that the proportion of votes gained by a party in an election is similar to the proportion of seats won in parliament. It is achieved by dividing the candidates in each district into the parties' lists. There are multiple mandates available to win in each district. The system allocates the adequate number of mandates to each list, which roughly reflects the aggregate number of votes. In order to avoid an excessive fragmentation in parliament, the countries often introduce the threshold -the minimal result in national level which party needs to

receive to get to the parliament. In Poland, the threshold is 5% for parties and 8% for coalitions. In this system, committees with highest results tend to win proportionally more mandates than parties with low results. One of the features of the D'Hondt system is that the party can gain a significant share of parliamentary seats, despite having a big negative electorate. An excellent example of a situation like this is the election in Poland in 2015, when Law and Justice won 235 out of 460 seats in parliaments (51%), despite gaining only 37.58% of votes in the election and having an extensive negative electorate (CBOS, 2015).Thus, parties can base their success in the election on the aggressive rhetoric, which targets the core electorate instead of courting for a vote of the more moderate voters. As a result, the D'Hondt method fosters the radicalization of political discourse and consequently, polarization of society. Furthermore, the governments formed as a result of the proportional election based on D'Hondt system tend to have a relatively low level of social support, what undermines their legitimacy and encourage the opposition to use obstructive political strategies.

The proportionality rule is intended to increase the representativeness of the parliament. Thus, the public should tend to identify with at least some fraction of the MPs. In fact, despite the seeming representativeness of the parliament, the public's opinion about Sejm tend to be significantly less favourable than on presidents (CBOS, 2019).

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Introduction to analysis

Assumptions

The paper assumes the implementation of the IRV and Schulze methods as the voting methods in the election to Sejm, as this chamber dominates Polish politics. However, apart from the Sejm's election, it could also be introduced in the senate elections as it would not affect the results of the analysis.

First, the article describes the mechanism of the IRV system and analyse the effects of the implementation of this system. Then, the article does the same with the Schulze method. The article conducts two types of analysis; ceteris paribus and the long-run analysis.

Ceteris paribus analysis

This type of analysis outlines the potential composition of the Sejm elected using the IRV and Schulze methods, without taking into consideration the long-run evolution of the Polish political stage caused by those institutional reforms. This type of analyses is more straightforward, as it includes fewer variables and unknowns than the analysis of the long-run effects. On the other hand, it is strictly theoretical and has a very speculative nature. It is because it assumes that parties would not adjust their strategies and rhetoric to the new institutional environment. Not only this situation is improbable to happen, but also it is against the primary assumption of this article, according to which the voting system actively influences the behaviour

of actors within the political system. Nonetheless, it is essential to conduct this type of analysis, as it provides a good starting point for further analysis. The analysis is based on the characteristics of the parties and their electorates; the electoral alternatives of the voters (CBOS, 2019); the parties' negative electorates (CBOS, 2019); the flows between the electorates (IPSOS, 2019) and the political views of the parties' electorates (CBOS, 2019).

The long-run analysis

The second part – the long-run analysis describes the expected long-run effects of the implementation of the IRV and the Schulze methods as a voting system in Poland within the following few terms of the parliament. In other words, it forecasts the possible trends in the Polish political discourse after the theoretical introduction of the electoral reforms outlined in the above chapters.

Instant Runoff Voting

The mechanism (Marron, 2003)

Instant Runoff Voting is a preferential, single-member electoral system used in national elections for the Australian House of Representatives (Australian Electoral Commission, 2014), American Congress in Maine state (Katherine, 2017) and parliament in Papua New Guinea. (Limited Preferential Voting, 2010) It is also used to select the presidents of Ireland (Limited Preferential Voting, 2010).

IRV is a ranking system, which means that the voter ranks the candidate from the most preferred to the least preferred. A voter ranks with number 1 the most preferred candidate, number 2 with the less preferred candidate, but preferred over any other. Then the voter can rank number 3 with his third choice and so on until he ranks the least preferred candidate. The winning candidate is selected by elimination. First, the system eliminates the candidate with the lowest number of votes (highest preferences), and his votes go to the candidates ranked 2nd by the voters who voted for an eliminated candidate. Then the procedure is repeated until one candidate has more than half of the votes. Usually, the voter can leave some candidates without any rank. It means then that he is preferred less than any candidate with a rank. Also, the voter can give two or more candidates the same rank. To minimize the probability of strategic voting (hiding the voter's true preferences in order to stop another candidate from winning), it is good to consider applying this method in the form of a head-to-head comparison of each pair. In that case, the voter would be simply asked: "Which of those two candidates would you prefer to win". However, the effectiveness of applying this modification has rather psychological, not mathematical reasons.

IRV system is expected to cause bipolarity in parliament. However, in case of IRV preferences of voters would be mapped more actually, as this system eliminates the problem of the waster votes - the votes not for elected candidates. In other words, in the IRV

system, every single vote influences the composition of the parliament. It is because voters, who voted for smaller parties can transfer their votes for bigger parties in instant-runoff. However, despite its relative complexity, the IRV is not the Condorcet winner. It means that the winner is not necessarily the candidate preferred over any other candidate in most of the direct duels. Therefore, the IRV system is not a Condorcet method. To exemplify this problem, let's assume that there are three candidates: A, B and C.

	40%	0%	11%	9%	0%	40%
1st	A	A	B	B	C	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

Source: Private

In that case candidate B is eliminated, as he gained only 20% of first-choice votes, while candidates A and C both received 40%. In the instant-runoff candidate, A received additionally 11%, while candidate C only 9%. Thus, in the runoff, candidate A won, as he received 51%, while candidate C only 49%. However, it is visible in the table, that candidate B is preferred over the candidate A by 60% of voters. Similarly, player B is preferred over player C also by 60% of voters. Thus, B>A and B>C in the direct duels. Candidate B is, therefore, a Condorcet winner, as he is preferred over any other single candidate. Nonetheless, under IRV, he would not win the election.

<u>Ceteris paribus effects of implementing IRV method in Poland. (Robb, 2011)</u>

Applying the IRV method in Poland is expected to cause a bipolarity in the parliament. It is because, in the most likely scenario, the two committees in the last "instant-runoff" (so after all other parties are eliminated) are the United Right and Civic Coalition. The later one would be expected to represent the left-liberal and euroenthusiastic bloc, by gathering the votes of Left's supporters(CBOS, 2019).On the other side of the political spectrum, United Right would represent the right-conservative and more eurosceptic bloc. This formation would supposedly gather the votes from Confederation's supporters, despite the differences on a field of economic between those two groups (CBOS, 2019). It is difficult to predict the exact behaviour of Polish Coalition voters without conducting more specific field research on this topic. The support of the Polish Coalition voters could supposedly tip the balance and give one of the blocs' victory. Nonetheless, Polish Coalition could get a small fraction of mandates as well, by winning in a few districts with the strong party structures of the Polish Peoples' Party.

Due to bi-polarity of the parliamentary system, it would be possible that either United Poland or Civic Coalition would get an absolute majority in parliament. Again, it would be difficult to state which exact party could get an absolute majority without conducting more specific field research. However, the fact that the opposition bloc comprised

from Civic Coalition, Left and Polish Coalition won a majority in Senate by forming an electoral alliance is an important premise suggesting the victory of the left-liberal side.

On the other hand, the result of the Senate election in 2019 could be different, if the United Right formed a similar alliance will all the right-wing parties, including the Confederation. Thus, the Senate election is not a straightforward estimation of the theoretical IRV election.

Neither the Left nor the Confederation would be expected to have a representation in parliament, as it is unlikely that any of those two parties would get over 50% of votes in the last "instant runoff" in any district.

Long-run effects of the implementation of IRV method in Poland

It is expected that in the long-run the parties would need to adjust their rhetoric and elections strategies to get over 50% of votes in the last "instant runoff" in the maximal number of districts. Thus, the system would incentivize the committees to court for a vote of the most moderate "centre" voters. As a result, the biggest parties would get closer to each other in terms of programme, rhetoric and political agenda. It would supposedly unlock the flows of electorates between the United Right and Civic Coalition (or their political incarnations). In other words, it would be more common for voters to hesitate between voting for those two parties and to change their preferences

from one of those parties to another. All the processes described above could result in lowering the temperature of the political discourse and what follows the mitigation of social polarization and mistrust. Not only parties would need to use more conciliatory rhetoric in order to win the hearts and minds of the most moderate voters, but also changing the political affiliation by the voter would be more frequent and thus seen as something natural.

Another feature of the IRV method is that it would be more likely for the winning committee to have an absolute majority in the parliament, as there would be fewer parties in the parliament. This could increase the stability of the system, as it would be more frequent fo the winning committee to form a single-party cabinet without conducting difficult negotiations with the potential partner. Thus, it would be easier to avoid situations like that in Belgium, where the parties could not manage to form a government for a long time after the election. (CNN, 2011) On the other hand, this feature of the IRV system could result in the hegemonic position of the largest party and create an incentive to ignore the voice of the opposition.

As it was mentioned above the radical parties would not be represented in the parliament. In some fashion, it would deprive the members of those parties the capability to represent their views using democratic tools. In turn, their members and supporters could feel alienated from the current political discourse. Thus, there is a risk that they would express their views using means different than those

provided by democratic institutions, within the legal system. Throwing stones at the police and burning cars during the protest could become a new standard for those groups. Thus, marginalization of the extreme parties could result in their further radicalization. This feature could foster the political polarization of society and negatively impact the national integrity. On the other hand, there are no wasted votes in the election based on the IRV system, unlike in the election based on the D'Hondt method. Therefore, contrary to the D'Hondt election, the composition of the parliament selected using the IRV method would reflect the views of all voters, still including those most radical.

The expected bipolarity in the parliament could potentially lead to the development of the two-party system in the long run. However, the two-party tendencies are expected to be less profound than in the case of the first-past-the-post majority system. It is because in the IRV system, there are no wasted votes, so the voice of the smaller parties' electorate is taken into account. Therefore the politicians from those parties have a tool to actively influence the public opinion. Fact that the actions of the minor parties are somehow effective could create an incentive for its members to maintain the existence of those parties, instead of transferring to bigger parties or giving up their political activities.

Another difference of those institutional reforms is that parties would become less autocratic and the power within those organizations would be more dispersed, similarly to the Anglo-Saxon

model. This feature is typical for the majority systems, where the MP's are more a kind of representants of their districts, not the soldiers in the strongly hierarchical political organizations. Thus, the tendencies of forming the wings within the political parties and alliances (for example Agreement and United Poland as the wings of Law and Justice, Modern and Polish Initiative as the wings of Civic Platform, KORWiN and National Movements as the wings within the Confederation) would intensify.

Schulze Method

The mechanism (Schulze, 2003)

Schulze method is a ranking system, similarly to IRV. Nonetheless thanks to its complexity, it is a Condorcet winner method. This system is not implemented in any national election yet. However, it is used in the several elections to the board of the companies or NGOs, including the Wikimedia Foundation. (Plamondon-Williard, 2008)

Markus Schulze, the creator of this method explained in his paper: "Basic idea of the Schulze method is that the strength of the indirect comparison "alternative a vs. alternative b" is the strength of the strongest path $a \equiv c(1),...,c(n) \equiv b$ from alternative $a \in A$ to alternative $b \in A \setminus \{a\}$ and that the strength of a path is the strength

(N[c(i),c(i+1)], N[c(i+1),c(i)]) of its weakest link c(i),c(i+1)" (Schulze, 2011).

Further description of mathematical mechanisms would significantly decrease the approachability of this paper. To avoid jargon and simplify the content, this article explains the mechanism basing on the following example, which divides into three stages:

Stage 1: Head to head comparison, identically to the IRV system. In case if the winner of the elections is the Condorcet winner, so is the winner of the direct head-to-head comparison in the majority of duels with other candidates, this is the end of the procedure. However, in other cases, the winner, it is necessary to proceed to the next stage.

Stage 2: Drawing a graph of pathways and their strengths.

Stage 3: Head to head strength comparison of both direct and indirect relations between each pair of candidates.

Let's assume that there is a small single-mandate constituency with 19 voters and 4 candidates: A, B, C and D. The following table illustrates how many times did a particular configuration of preferences occurred.

	7	4	3	5
1st	A	D	B	D
2nd	B	A	D	A
3rd	C	B	C	B
4th	D	C	A	C

Source: Private

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Below are the example results of the simple head to head comparison in case of a hypothetical duels in the 1 vs 1 instant runoff. A>B, as 16 voters preferred A over B and only 3 voters preferred B over A.

A<D, as 12 voters preferred D over A and only 7 voters preferred A over D.

B>D, as 10 voters preferred B over D and only 9 voters preferred D over B.

There is no Condorcet Winner, as A>B, B>D, but A<D. To find a most preferred winner, the system checks the strength of the certain preferences, by subtracting the number of losing votes from the number of winning votes, so that:

A>B: 16-3=**13**.

A<D: 12-7=**5**

B>D: 10-9=**1**

It is visible that, according to simple head-to-head comparisons, the preferences of the group are not transitive (Transitivity: If X>Y and X>Z, then X>Z). The clue of the method is to examine the preferences by examining the strength of both direct and indirect relations between the candidates. All relations are presented by the "pathways" of preferences. The chart below presents the above reasoning graphically:
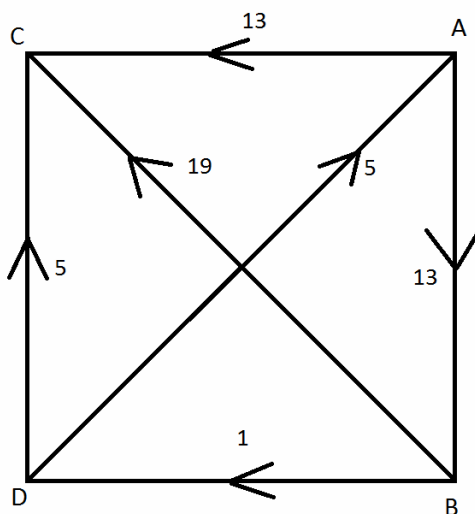
Each corner symbolizes one different candidate. The arrow on the graph indicates looser. The number near to the arrow represents the strength of direct preference. The shortest pathway between B and D represents the direct relation. Due to the direct relation B>D. However, D>A and A>B. In that case, the indirect relation is B>A>D. Schulze method compares the strength of direct relation, so the shortest pathway, with the strength of the indirect relations, so the pathways composed by more than 2 candidates. In the pictures below there are graphical representations of those two types of pathways and the relations between B and D:
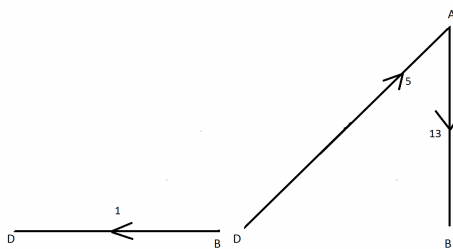
The picture on the left represents the shortest pathway, while the picture on the right represents the longer pathway, composed of 3 candidates. In the example above, the strength of the direct preference is equal to 1. It is because 10 voters preferred B over D and 9 voters preferred D over B. On the other hand, the strength of the indirect preference is equal to 5, as 5 is the weakest preference in this pathway. Thus, the preference D>A>B is stronger than the preference B>D, as 5>1. Therefore, in this case, the Schulze winner of the head-to-head strength comparison between D and B is D.
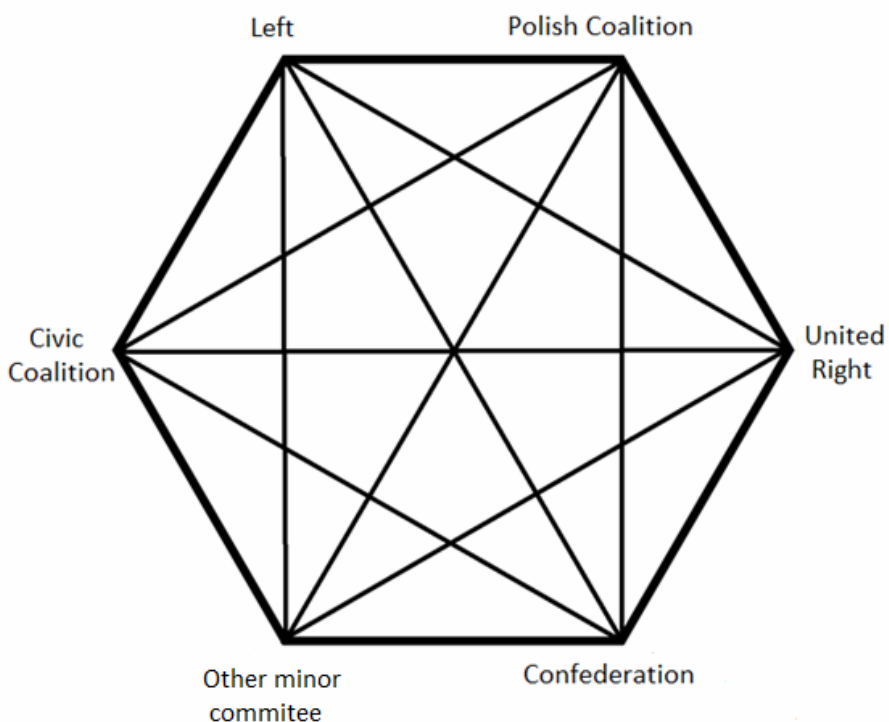
The aggregate of the all direct and indirect preferences would give the following result: D>A, D>C, A>B, B>C, A>C, B>D. Thus, the Schulze winner is candidate D, as he won all head-to-head strength comparison.

<u>Ceteris paribus effects of implementing the Schulze method in Poland</u>

In opposition to the IRV, the Schulze method might not favour the main parties, so the United Right and Civic Coalition. It is because under this method, the winner should not have an extensive negative electorate. As the Schulze method is the Condorcet method, the most obvious effect is that the winner in each district would be a Condorcet winner. As a result the winning party at the central level would be rather moderate. The party traditionally seen as a bridge between the right-conservative and left-liberal camps is the Polish Peoples' Party, the core member of the Polish Coalition. It is, therefore, possible that

this party would win the most significant share of seats in parliament. Supposedly, Polish Coalition could also win an absolute majority. However, in many districts in Eastern Poland, the Condorcet winner could be the United Right – in some constituencies this group has over 50% of support even in D'Hondt elections. Also, Civic Platform could win in some metropolitan districts. Nonetheless, it would be almost impossible for Left and Confederation to get any mandates. To sum up, the main fractions in the parliament would be the Polish Coalition and the United Right

The chart below represents the pathways of direct and indirect preferences between the electoral committees.

Chechliński, Z., The effects of the hypothetical implementation of preferential voting methods in Poland on the Polish political stage and national integrity, European Journal of Geopolitics, 7, 2019, pp. 34-66.

Long-run effects of the implementation of the Schulze method in Poland

It is difficult to forecast the evolution of the political stage and discourse in Poland after the implementation of the Schulze method. It is because this system has never been implemented on the national level in any country. The examples from organizations like the Wikimedia Foundation might not include all the complexities related to the politics at the national level. Nonetheless, this chapter is trying to forecast to most obvious trends at the Polish political stage after the hypothetical implementation of the Schulze method.

As it was mentioned above, in every single district, the Condorcet winner is the most compromise candidate. However, after the implementation of the Schulze method, Poland would be divided into 460 separate districts. Therefore it is important to avoid the intellectual temptation of treating the whole country as one big electoral district. However, despite political divisions between the Eastern and Western Poland, as well as between the electorates in the large cities and the countryside, none of the five main political groups in Poland has a regional character. Polish political stage is significantly less regionalized than British or Spanish. Therefore, the strategy of relying on the support of one region, ignoring the rest of the country would not be a default option for any of the main powers. Thus, to win the general election and rule the Poland parties would tend to court for a vote in the whole country, not only in part of it. It is necessary to

highlight this finding, despite its seeming obviousness, because it leads to the conclusion that not only is the Schulze winner most compromise in each district, but also the party with the biggest share in the parliament is most compromise (or at least close to compromise) on the aggregate level. Thus, it is reasonable to expect, that in the long run only the relatively moderate parties would be able to win the elections and rule the country.

Thus, the implementation of the Schulze method would result in mitigation of the confrontational and radical rhetoric, as the parties would strive to minimize their negative electorates. This feature would reduce the temperature of the political dispute and in turn, decrease the social polarization. The differences between the main parties would diminish, and the borders between their agendas would become more blurred.

A decrease in social polarization seems to be an attractive prospect for politically divided Poland. However, the governments formed by the parliaments chosen in the elections based on the Schulze method could be incapable of introducing a necessary, but unpopular reforms. Poland could end up having in having perpetual "warm water in a tap" policy – a situation when the government avoids introducing the important, but unpopular reforms for the sake of temporary stability.

Also, it is possible that introducing the Schulze method would cause the effect opposite the one intended. As it was mentioned

above, it would be crucial for the parties to maintain the relatively low level of the negative electorates. Possibly the parties would not directly attack each other in an obvious way, in order to maintain opinion of the Doves of Peace. Still, negative campaigning could be a domain of the media. Therefore, it could create an incentive for the media informally affiliated with the party A to viciously attack the party B and vice versa. This could, in turn, increase the political divisions between the camps and thus foster the polarization of society.

It would be very difficult for the radical parties to win any constituency. Similarly like in the case of the IRV system, the marginalization of the extreme parties could result in their alienation and further radicalization. This problem could be more profound in the case of the Schulze method, as the mainstream political stage would be even more moderate. Thus, it would be even more difficult for the extreme voters to identify with any of the sanitized parties in the parliament.

Finally, the Schulze algorithm is complicated, and many voters could struggle to understand it. As a result, they could feel alienated and tricked by the mainstream parties, which base their legitimization on some incomprehensible mathematical calculations. Thus, paradoxically, using the sophisticated algorithm which faithfully reflects the preferences of the public could result in a peoples' distrust towards the state.

Conclusion

To sum up, due to the simple majority voting system used in the presidential elections, the candidates for presidents need to use conciliatory rhetoric to court for a vote of moderate voters. In contrast, the D'Hondt system allows the parties to win the Sejm's election despite having relatively big negative electorate. Thus, the parties can use less conciliatory rhetoric which increases the temperature of the social discourse and in turn, fosters the social polarization.

The Instant Runoff Voting is a preferential method of voting, which allows the electorates to rank the candidates. Ceteris paribus, introducing this system in Poland would result in forming a bipolar system in the parliament, with the leading role of the conservative United Right and centre-left Civic Coalition. In the long-run implementation of this system would result in decreasing of the temperature of the political discourse and thus the social polarization, as the parties would need to court for a vote of the so-called "moderate" electorate to get over 50% of votes in the last "instant runoff" in the maximal number of districts. The bipolar system in the parliament could increase the stability of the cabinets, as they would not need to negotiate with the potential partner. However, it could potentially also increase the autocratic tendencies of the majority

parties in the Sejm. In the long the implementation of the IRV system could potentially lead to the formation of the two-party system. However, those tendencies would be less explicit than in case of other majority systems. Nonetheless, parties would tend to be less autocratic and more dispersed. It could lead to the formation of the wings within the political groups, similarly to the Agreement and United Poland parties within the United Right coalition. It would be possible that the extreme parties which supposedly would not be represented in the parliament would radicalize, as their members and supporter could feel alienated from the mainstream political discourse.

Schulze method is the preferential voting systems, more complex than the Instant Runoff Voting. The winner in the Schulze method is also a Condorcet winner. It means that in Schulze winner would win in the majority of the simple 1 vs 1 comparison with any other candidate. Thus, the Schulze winner in any of the constituencies would be the most compromise candidate.

Ceteris Paribus, the winner of the Schulze election on the national level, would be moderate, compromise party, supposedly the Polish Coalition. Implementation of the Schulze method as the voting system in Poland would be expected to lower the temperature of the political discourse and thus, social polarization. It is because the parties would need to minimize their negative electorate. However, introducing the Schulze method as the voting system in Poland would

also create risks. First, the parliament politicians could avoid the important, but unpopular issues, not the increase their negative electorates. Also, the role of negative campaigning could increase. What is more, the problem of further radicalization and alienation of the supporters of the extreme parties could be even more profound than in case of the IRV system. Finally, this system is complicated and possibly many voters would never understand it.

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