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What Affects Voter Turnout?
Macro and Micro Evidence from Poland

Abstract

The aim of this paper is to discuss briefly the issue of voter turnout and ascertain what kind of socioeconomic variables can affect it. The main body of the article is devoted to the search for empirical findings on the basis of the Polish presidential and parliamentary elections in 2010 and 2011 respectively. The central analysis is conducted using OLS regressions on NTS4 areas (powiat) with the utmost importance attached to the role of socioeconomic variables and especially to the role of adversities such as unemployment and other features of the labor market. Furthermore, the logit model has been built on individual data in order to corroborate (or debunk) findings derived from macro regressions. Although it was not the main intention to study in detail the theory of various turnout models it seemed instructive to sketch them along with stylized facts regarding the phenomenon of voting.

Keywords: elections, voter turnout, unemployment, expressive voting, instrumental voting.

1. Introduction

There is voluminous and growing literature stressing the importance of the institutional impact on the economy. Among numerous aspects of both formal and informal institutions (for an engaging review of such institutions see Garbicz (2012)) that can be perceived from highly theoretical but also empirical vantage point it seems that political institutions received special attention. Works of such illustrious economists as D.Acemoglu, A.Alesina, T.Persson or G.Tabellini, to list only the most notable and recent ones[1], shed some light on the way how political settings can affects nearly all domains of a democratic country.

Elections, which are the crux of this text, play a role of the utmost significance among other institutions of a political nature and the electoral competition of politicians, parties or unions should not be underrated. Electoral competition can shape the state of public finance, rates of economic growth and the stability of law, see Persson et al. (2003) or Alesina et al. (2003).

An issue that needs some further investigation, and is the topic of this paper, is the voter turnout. First attempts to explain the phenomenon of varying turnouts

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[1] It is worth noting that one of the first authors that dealt with political issues in the economic context was Michał Kalecki, see "Polityczne aspekty pełnego zatrudnienia (1943)".

both between countries and in the march of time were made in the end of the fifties and went further as the democratic society developed. It seems that right now the literature in this area, which covers the obviously overlapping field of economics and political science, is quite rich and touches various aspects of the election attendance. The progress is made both on the ground of theoretical models, which explain more and more of the reasons why people attend the polls, and empirical ones which discover new "stylized facts" about decisions why we cast ballots.

Nevertheless, the empirical literature is focused mainly (in fact solely) on the US and Canadian elections leaving many questions open in the realm of European elections that are a far cry from the American ones. Totally different electoral procedures, historical background and socioeconomic conditions suggest that some aspects of the voting behaviour may differ. This is the reason why it might be instructive to examine several issues that have been already investigated, at leasts to some extent, using North American data but this time using Polish data in order to establish if any potential discrepancies exist between Poland and Western countries.

The history of Polish elections and political development is a riveting subject in itself (for an excellent and brief overview of socioeconomic and political changes in Poland over the ages see Morawski (2010)). Obviously, it is far beyond the scope of this text to delve into historical details of elections in Poland yet as the past affects the present and the future it is worth pointing out that first privileges containing some electoral rights are dated to 1454 (Nieszawa, Cerekwica) and, above all, 1505 (Nihil Novi, Radom) while the first time a king was elected was 1573. In the era before 1793 the attandence during elections, both regional, parliamentary and regal, was extremely high, which probably reflected the fact that it was an elite's *privilege* to cast a vote. In the interwar period the turnout ranged between 60-70%, which is much higher in comparison with the turnout after the collapse of socialism. Elections in the era of socialism were organised regularly and they were equally regularly subjected to electoral frauds so their real outcomes are entirely uncertain. The turnout of these elections was significantly overrated for the issues of propaganda and the act of voting was often more or less extorted, which in reality made elections compulsory. All this resulted in an official turnout above 95%. The voter turnout after 1990 is summarized in table 1.

The nineties was an era of serious social and economic upheavals that resulted in enormous political instability. It makes it impossible to disentangle the influence of various factors on elections as they were subjected to severe shocks in the turbulent environment. Political issues are particularly sensitive with respect to the (in)stability of the socioeconomic environment and this feature resulted in significant turnout dispersion across elections. Furthermore, the appalling quality

of data or even the lack of any data sources makes the research entirely infeasible even on the ground of the pure econometric theory. Political conditions in Poland seem to have stabilized since 2004 when Poland became the member of the EU, which, together with better data sources, suggests focusing on last elections only in order to conduct any kind of research.

Table 1. Voter turnout in Poland since 1990

Elections	Turnout in %	Elections	Turnout in %
Presidential I 1990	60,6	Local 2002	not available
Presidential II 1990	53,4	Referendum 2003	58,9
Local 1990	42,2	European 2004	20,9
Parliamentary 1991	43,2	Presidential I 2005	49,7
Parliamentary 1993	52,0	Presidential II 2005	51,0
Local 1994	33,8	Parliamentary 2005	40,6
Presidential I 1995	64,7	Local 2006	46,0
Presidential II 1995	68,2	Parliamentary 2007	53,9
Referendum 1996	32,1	European 2009	24,5
Parliamentary 1997	47,9	Presidential I 2010	54,9
Referendum 1997	43,3	Presidential II 2010	55,3
Local 1998	not available	Local 2010	47,3
Presidential 2000	61,1	Parliamentary 2011	48,9
Parliamentary 2001	46,3		

Source: State Election Commission (Państwowa Komisja Wyborcza).

The main aim of the article is to ascertain what is the driving force that makes people vote. Large and relatively stable differences in turnout between areas in Poland (highest turnout in NTS4 areas is about 70% while the lowest just about 30%) imply that there must be some long-term relations between the propensity to vote and socioeconomic features of a potential voter. What these features are and if they are in line with the the conventional wisdom is the topic of this paper.

This paper is organized as follows: section 2 gives a brief overview of theoretical models enunciating the voter turnout; section 3 presents the most important general stylized facts regarding the turnout and points out some directions of research to be conducted in this paper; section 4 reviews the data used for the statistical investigation; section 5 and 6 discusses results of macro and micro models respectively while section 7 concludes.

2. Theoretical aspects of voter turnout

The aim of this paper is not to elucidate the theoretical frameworks enunciating the phenomenon of voting. Nevertheless, it is instructive to sketch briefly these theories as they lay excellent ground for the empirical research.

2.1. Instrumental voting

The first complex theory trying to explain voting behaviour is attributed to Downs (1957). His seminal contribution has become the ground for political economics and nearly every paper touching the issue of political competition, no matter which field of economics the main issue of an article pertains to, is based on the Downsian model or its conclusions like the median voter theorem.

The model is built on the neoclassical assumptions of a rational agent: such agent acts in a way that maximizes his/her expected utility according to his/her idiosyncratic preferences over a set of alternatives. In the context of electoral behavior alternatives are embodied by different policy proposals connected with certain politicians or parties. The distinguishing feature of the model is the fact that the utility is derived solely from the electoral outcome, which bears a close analogy to the consumer choice problem on a competitive market.

The decision whether to cast a vote is summarized by the following equation (Geys, 2006):

$$R = P \cdot B - C > 0,$$

where P is the probability of being the pivotal voter, B is the value of a difference between material benefits connected with particular policies represented by certain political parties and C is the cost of voting.

Rational voter decides to attend elections only if R takes a positive value. As the rational voter cares *only* about the actual outcome of the election and the way he/she can affect it, the fundamental equation of the model creates the so called "paradox of (not) voting". As the probability of being a pivotal voter, even in moderate elections, is negligibly small[2] the value of the expression $P \cdot B$ is close to zero, which implies that R is negative in case of nonzero voting costs. The costs incurred by a potential voter can come both from actions connected with the information collection about policy proposals and from such expenses like time and money devoted to getting to the voting station. The expected turnout is equal to zero and, contrary to common sense, such turnout is desirable in the model as it is economised not to vote.

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[2] Precise values of the probability vary between authors; see the appendix of Edlin et al. (2007). Nevertheless, this probability can be comapared to the chance of hitting the jackpot in a national lottery and is of order $1/n$, where n is the number of voters.

The zero turnout is not the only drawback of the Downsian model, see Brennan, Hamlin (1997). The framework cannot provide any explanation for abstention because of political alienation; it projects that in case of a nonzero turnout equilibrium, which is possible under some untenable assumptions, voters are drawn from the very tails of the political preference distribution; the phenomenon of strategic voting cannot be introduced and it is impossible to support the idea of voting for unpopular parties having no chance to win any elections. Nonetheless, the instrumental voter model is the cornerstone and the reference model for other contributions in the field of electoral economics. Moreover, the model can explain electoral behaviour at the margin, i.e. it can account for changes in individual decisions induced by changes in model parameters.

2.2. Expressive voting

Expressive behavior, which contains also actions in the realm of electoral competition, are all the actions that are taken in order to manifest and confirm someone's identity or stance. These actions are not deemed as irrational yet only in a situation in which we do not preclude the derivation of utility from aspects of life that are not material. In this context the utility is given as follows, see Hillman (2010):

$$\text{total utility} = \text{material utility} + \text{expressive utility}.$$

Expressive and material utility can exist both in conflict or be of the same sign. A rich person may object to a higher tax rate on the ground of his own financial interest but support them because he/she wants to be linked with an identity as a person believing in the importance of hight tax rates for social cohesion.

The expressive voting evolves according to following equation, see Riker, Ordeshook (1968):

$$R = P \cdot B - C + D > 0,$$

where D represents all benefits derived from the expressive voting or from fulfilling the civic duty by casting a vote; other variables are the same as in the instrumental voting environment. As $P \cdot B$ is close to zero, the decision to vote or to abstain is made in comparison to C and D. It means that voters participate in elections without any economic reasoning about future stances of a potential government and their policy consequences. The main problem with the expressive voting theory is the fact that it does not offer a predictive power as it is based on an assumption of vague idiosyncratic preferences explaining all decisions.

The expressive model accentuates the *act* of voting; it is the *action* that is important, while the final outcome is not significant. This is why expressive voting

can be perceived as watching a football match by a football fan rather than as a consumer choice. A person can vote for his preferred candidate but also he/she can try to vote in order to punish a hated politician, which opens the way for strategic voting. Expressive voting behavior can be perceived as attached not to a certain politician but to a certain group of supporters: a person votes to stress belonging to a well-defined group.

The expressive model can lead to the so called "expressive voting trap" as it is based on the tenet of the insignificant probability of one vote being decisive. The material utility is of negligible significance because of the zero probability of being pivotal so decisions are made solely because of the expressive utility component. This behavior is replicated for all voters and there can be a majority support for a policy that each individual member of the supportive majority would oppose if he/she could.

2.3. Social groups, altruism and ethical voting

Rational agents are most often assumed to have entirely selfish preferences, which is in line with the approach proposed by Adam Smith. Even if a model takes into account some variances of utility that does not come directly from material aspects of the existence (e.g. expressive voting), the spare utility is attributed just to a certain agent and comes solely from him/her alone. Such an approach can seem to be erroneous and needs an introduction of more general preference system that also embraces other people's utility: $U = U_{own} + \alpha_i \sum_i U_i, \ \alpha_i \geqslant 0$.

Goodin, Roberts (1975) found that in the setting of the negligible probability of being pivotal and therefore the negligible value of U_{own} the altruistic preferences dominate the egocentric ones and it can be rational to vote because of the utility derived from the impact of the electoral outcome on the whole society. An interesting formal development of such an approach is presented by Edlin et al. (2007). Their model contains a feedback mechanism that stabilises the turnout in large elections: a larger electorate lowers the probability of being pivotal and therefore lowers the individual part of the utility but inflates the importance of the altruistic part of preferences. Main equations of the model can be given as follows:

$$U = P \cdot B - C,$$
$$B = B_{self} + \alpha N B_{soc},$$

where $P = \beta/N$ and β is the competitiveness factor, N is the number of population members, B denotes benefits connected with the political outcome, α is a discount factor and U denotes own utility.

Results of the model are in line with common sense and with most of the empirical findings, which means that ethical voting models can be a valuable source

of knowledge about voting. A potential drawback about this group of models comes from the psychological point of view: how to disentangle own preferences and other's ? We all tend to think that what is good for us is good for (almost) every one else.

The altruistic approach can be also reviewed in the context of social groups, see Rotemberg (2008). His model is based on the tenet that people tend to be more altruistic towards those who agree with them and people's utility is higher the more people share their beliefs. This assumption can lead to a conclusion that people vote to raise the well-being of other members of the society who share their political opinions and this mechanism can justify a positive turnout equilibrium and some other existing empirical findings.

Finally, one can think of models stressing the importance of benefits given to the whole groups (eg. pension privileges for certain professions) as they can outweigh costs of voting at the group level, see Grossman, Helpmann (2001). The social pressure can force group members to vote even if they have some incentives to depart from voting because of nonzero voting costs.

2.4. Other theories of voting

The already mentioned theories of voting constitute the most important (instrumental and expressive voting) or promising (social group theories) explanations of voting behaviour. Nevertheless, there exist other theoretical views that are worth noticing.

- **Minimax regret and information processing.** Potential voters face a decision problem under uncertainty as the probabilities about states of the world (in this case: the real attitude of politicians against given issues) are unknown or at best ambiguous. Rational voter try then to act in a way that should result in a minimal regret in the worst scenario (Farejohn, Fiorina, 1974). Information models are similar to some extent with the minimax regret ones as they also accentuate the limited access to information. Imperfect information, combined with risk aversion, can lead to a situation, in which a potential voter decides not to vote as he/she is not certain if the most preferred candidate is in fact the right person to vote for, see Matsusaka (1995). More information makes the potential regret derived from choosing a wrong candidate less severe so better informed voters are more inclined to vote whereas uninformed ones decide to delegate the voting responsibility to apt members of the society. Furthermore, it is crucial to keep in mind that information collection and processing is costly so groups with different opportunity cost in this field or elections with different information cost can experience various turnouts. In general, the information models cannot offer a better explanation why people vote than a mere remark that they have a propensity to vote and the propen-

sity can be lowered by the lack of information. Nevertheless, they are capable of accounting for different participation rates among different groups.

- **Game theoretic approach.** The main tenet in this class of models is that the problem about voting is not just an individual's decision but a decision explicitly involving other people's behaviour. In general, the voting decision revolves around the probability of being pivotal – if everyone decides to vote this probability is small, which leads to the decision to abstain from voting. Then, if no one votes the probability is equal to one so it is rational to vote yet it results in a situation in which everyone votes and this line of reasoning can be repeated without end. According to Palfrey, Rosenthal (1983) such model can have an equilibrium with a positive turnout yet it needs some unrealistic assumptions like perfect information. Furthermore, it seems that strategic interactions can exist only in extremely small elections like trade union elections in the USA, see Farber (2010), and it is dubious if the game theoretic model can be applied to any larger elections.

- **Adaptive learning.** The model is built on the assumption that people learn on their own past behaviour or on the behaviour of others. People link their past actions, i.e. voting or abstaining, with positive or negative utility derived from the election outcome and in case their action resulted in some positive utility it is replicated. Positive and negative utility is allotted to actions depending on the election of a preferred candidate or his/her opponents. Moreover, the adaptive learning takes into account the possibility of habit formation: people that have already voted are more inclined to vote again. This group of models seems to fit the stylized facts relatively well as it projects a positive turnout rate and can reflect differences in participation rates across different groups and elections types.

There is no theory that could answer all the questions regarding the voter turnout on the basis of the rational agent assumption. Every theoretical proposition cannot cope with at least some of the stylized facts such as the positive turnout rates or different participation among various socioeconomic groups. It seems that progress can be achieved by attempts to unify several less complex theories, see Geys (2006). Such an approach was proposed in Brennan, Hamlin (1997), where the instrumental and expressive voting have been integrated resulting in concise outcomes. Conclusions derived from this kind of eclectic model can be used for an empirical research like the one in this paper.

3. Empirical findings regarding turnout

There exist a vast amount of literature devoted to the empirical verification of various theoretical hypotheses regarding the turnout levels. This section

presents a brief overview of the main results of the empirical research. Socioe-conomic factors play the most important role in the analysis conducted in this paper, therefore the previous empirical analysis in this field deserves special attention. Nevertheless, some insight that does not touch the main issue directly is also presented.

3.1. Evidence about the rational voting approach

Surprisingly, the issue of whether the voting decision of an individual can be perceived as a rational choice or not has not received much attention in the research literature. The reason for this can probably be some degree of pragmatism among researchers: in the worst scenario, if it turns out that the voting decision is to a large degree made on a random whim or is just subjected to fully idiosyncratic variables and shocks that affect individuals in a totally heterogenous way it would be impossible to formulate a theoretical model capable of positing any projections about the voting phenomenon. Furthermore, as we can observe actual individual political decisions in extremely rare situations we have to rely on polls or experiments that are necessarily based on opinions, declarations or artificially "extorted" decisions, which can be a particularly acute problem in setting like research in electoral decisions.

The evidence about the voter's rationality and motivation is mixed. Blais, Young (1997) found in an experiment setting (groups of students were subjected to a short lecture about the paradox of voting and the fact that the probability of being pivotal is minimal; those who attended the lecture were less inclined to vote in national elections that were held shortly afterwards) that voters's behavior does not reject the rational voter theory at all as there was a nonzero response to the information about the probability of affecting the elections, yet point out that voters rarely think about elections in "costs & benefits" terms. Moreover, Mycoff et al. (2009) found that the identification regulations, which differ in the US among states with the respect to the strictness, do not cause significant differences in the turnout although they might pose some difficulties for potential voters and therefore could be perceived as additional costs. This could suggest that voting is rather a form of some habitual activity exercised mainly on the grounds of civic duty instead of thinking about it in the context of a rational choice action, especially in the light of research made by Blais, Achen (2011), which points out how important the sense of duty is for voters.

On the other hand, Fraga, Hersh (2010) found that exogenously imposed costs in the form of inclement weather can cause some significant declines in the turnout but only in case of elections that are not close. This finding, along with the obvious empirical fact that flat distribution of preferences among voters makes the turnout higher, suggest that though the instrumental voting approach

must be important at least to some voters or in some situations. Farber (2010) confirms the hypothesis of, at least, partial applicability of the rational choice method using a tremendous set of nearly 75 000 elections concerning trade unions in the US. The qualities of these elections (size, stakes or incurred costs) were different from the nationwide political ones so it is arguable if these results could be generalized, yet the result shows that about 20% of voters decides to cast a ballot in accordance with the (subjective) probability of being pivotal to the elections.

The expressive choice theory is proved in the experimental design only to a small extent, see Carter, Guerette (1992). It can be argued that the reasons for that are experiment limitations. Kamhon, Yang (2000) confirm the expressive voting theory using the poll about the presidential election in the US in 1988. They find some evidence about two sources of utility: the one connected with the fulfillment of the civic duty and the other found in the expression of preferences. Furthermore, they do not find any influence of the probability of being pivotal on the decision whether to abstain or not.

3.2. Impact of socioeconomic factors

The significance of the impact of a broad set of socioeconomic variables on the turnout is beyond any discussions. Nevertheless, the direction and size of this impact is often unclear.

Firstly, it is of little doubt that the propensity to vote rises with education and income. Lijphart (1997) suggests, by giving a concise overview of related empirical research, that voting is a feature of the upper and middle class with little, if any, evidence that could debunk this hypothesis.

Independently given variables such as age and sex are important sources of variation in the observed turnout. Women seem to be more inclined to cast to a vote, while the relationship between voting and age is likely to be nonlinear: inclusions of both "age" and "age^2" in econometric specification is a common procedure. The propensity to vote is highest for those in the middle age and is lower for youngsters and the elderly, see Geys (2006). The marital status is slightly important and married persons are more inclined to vote.

The role of the labor market for the electoral turnout has not been investigated intensively and the results are, in general, mixed. The theory offers the following hypotheses about the effect that unemployment and economic adversities can have on the individual propensity to vote.

- "Withdrawal" is a most popular concept, whose evidence was found the first time probably by Rosenstone (1982) and corroborated by Schur (2003). It says that being unemployed and suffering from economic adversities causes people to decrease any kind of social and political activity. Reasons for that

are both psychological as the unemployment is very stressful and humiliating and economic as being unemployed can, paradoxically, raise the opportunity cost of voting because the unemployed have to use their scarce financial and finite time resources to survive and look for a job opportunity.

- Although the vast majority of evidence suggests the hypothesis of the depressing impact of unemployment on the turnout, there is some evidence that contradicts it. Burden, Wichowsky (2012) claim that they found contradictory evidence both on the aggregate and individual level. The theory that stays behind these results is based on fact that the unemployment level is a measure that is easy to understand and to follow for most citizens and it is the main indicator of the state of an economy and voting is the easiest and a low cost activity to remedy economic adversities that hit the economy. To put this simply, voters and potential voters can punish incumbents by "negative" voting, especially as the high average unemployment rate takes the blame for being between jobs out of an individual and can give him/her back the sense of activity.

- "Unemployment-in-the-context" hypothesis, proposed and advocated empirically by Incantalupo (2010), posits that the impact of economic hardships, which are best embodied by the unemployment status, is shaped by the general socioeconomic context and can be supposed to be nonlinear. It is claimed that in the context of low unemployment a job loss can be perceived solely as an individual problem and therefore can be connected with all the demobilizing features. High levels of unemployment can lead to a perception that this phenomenon is a social problem rather than a mere individual failure and it can be mobilizing to vote.

- The hypothesis of no impact is based on the idea that counteracting factors can either be balanced or that voters do not in fact attach so much importance to their labor market status, at least in the context of electoral competition. The evidence for this assumption is so weak and outdated that it is not even worth noting.

The negative situation in the labor market can be, at least to some extent, perceived as relatively independent from the income inequality, and, even more, from the feeling of subjective unequal distribution of wealth. The research made by Horn (2011) suggests that taking into account only income dispersion while partialling out the effect of other variables such as individual characteristics produces a negative impact of the inequality although the effect is not particularly strong.

In the light of the theory, the information processing and its availability can play a crucial role in the "to vote or not to vote" decision. The individual's situation on the labor market can in turn affect significantly the capability of collecting information. Verba et al. (1995) claim that the the work environment

offers skills and opportunities to exchange and collect political information. In-
cantalupo (2010) points out that the unemployed have more leisure time and
could therefore devote more time and effort to activities connected with infor-
mation processing yet the empirical evidence is precisely opposite. Nevertheless,
Melvin, Kerwin (2011) present some empirical findings confirming the opposite
theory that employed individuals possess reduced political knowledge because of
the fact that they are less exposed to the media.

It is a well-know fact that there is a strong and positive correlation between
the declared degree of church attendance and a wide variety of pro-social activities
and behaviour, which also embraces voting turnout. Gerber et al. (2008) try to
establish if there is a causal relationship between the turnout and the attitude
towards religion with a conclusion that the turnout can be caused by the church
attendance.

3.3. Turnout bias, partisanship and normative suggestions

High turnout rates are almost always perceived as a positive sign and as
an indicator of the good state of democracy. A lot of individuals, celebrities,
governmental organizations as well as NGOs pay attention to actions, whose
aim is solely to increase the turnout. Their motivation is probably to promote
prosocial behaviour yet the real political outcome of these actions can be, at least
theoretically, crucial to the electoral result.

It is argued in numerous studies, eg. Lijphart (1997), that there are significant
differences in individual socioeconomic features that affect the decision of whether
to cast the voting ballot or not, which has been presented in the former section.
These differences can shape political preferences and be correlated with them. It
leads instantaneously to a hypothesis that those who vote more often are different
in political attitudes from those not voting, which must result in a turnout bias.
The issue whether the turnout bias in fact exists and if a higher turnout could
lead to significantly different results is a matter of considerable controversy (see
Hansford, Gomez, 2010) for a brief review of literature in the field).

Blais et al. (2006) contradict the existence of the bias and claim that differ-
ences in opinions with regard to various political issues are of small significance
between those who vote and those who do not. In result claims of higher turnout
rates helping certain parties by taking into account votes of those rarely vot-
ing are unjustified. On the other hand, Hansford, Gomez (2010) find evidence
of some serious ramifications resulting from higher turnout rates: a better re-
sult of the American Democratic Party, some skeweness against incumbents and
higher volatility of results. The mixed results of the research can be attributed
to different econometric techniques and the question itself has not been answered
yet.

4. The data

In the vast majority of applied econometric research the data quality and availability fails to meet highest standards. Unfortunately, in case of Poland, this hurdle seems to be especially difficult to overcome because of socialism and transition times that resulted in serious data problems or its total unavailability.

The data that has been used for the macro models comes from 3 sources: State Statistical Office (GUS), State Election Commission (PKW) and Catholic Statistical Institute (Katolicki Instytut Statystyczny). PKW offers data for just a couple of last elections (not to mention the fact that the data is incosistent across elections and provided in an extremely user-unfriendly way), which narrows the research posibilities and forces us to focus on 3 last elections only. Unfortunately, the data unavailability prevented the incorporation of such factors into the model as the inequality measures or the weather. The last factor could be particularly valuable as the weather is said to affect the election turnout (and in fact the election outcome too, see Fraga, Hersh (2010) or Hansford, Gomez (2010)), yet the evidence is particularly scant.

The macro research is based on the 378 cross-sectional observations (3 elections are treated separetly) out of 379 NTS4 (powiat) areas in Poland in years 2010 and 2011. Sopot has been treated as an outlier being an area with nearly all values as extremes: the highest turnout, remuneration and the lowest unemployment. Along with a very small population it should be rather treated as a luxorius part of Gdańsk and therefore it has been dropped out of the dataset.

Polish General Election Study 2011 (Polskie Generalne Studium Wyborcze 2011, PGSW) was the only source of microdata. PGSW is a survey that was carried out in October 2011 and included the whole area of Poland. Unfortunately, the feedback ratio was different in various layers and the overall feedback ratio was about 40% (there are 1919 records out of 4832 planned interviews). In order to solve the problem of different participation rates among layers there are weights designed to counteract this phenomenon. As usual in such surveys, the voter turnout is overrated. This is because either people perceive voting as a socially desirable action and are ashamed to admit they failed to fulfil this duty or surveys are biased in the way that those who accepted to answer the survey are more inclined to vote, see Blais et al. (2006). Furthermore, the quality of some answers makes it impossible to use them in the research. It is perfectly exemplified in questions regarding person's income, where about 40% of the surveyed refused to give any answers, or marital status. Nevertheless, there is nothing one can do with an already existing survey.

The sample contains 1919 interviewed persons yet 54 persons have been dropped because they were ineligible for voting in the elections in 2010 and 2011,

mainly because of the age condition. A detailed description of the data is given in the appendices.

5. Macromodel

This section presents two models that are based on the macro data. The first one addresses the question how stable turnout rates are with respect to the time by regressing the turnout rates in certain areas on turnout rates of earlier elections. The other model is the heart of the paper as it ascertains the impact of various variables on the turnout rate.

5.1. "Auto-regressions"

Even a brief inspection of table 1 suggests that various election types in Poland are associated with different turnout levels, which clearly imitates Western countries' pattern. Alas, the data unavailability makes it impossible to conduct a thorough research in this aspect and asess quantitatively the differences. Furthermore, the nineties and beginning of the 21st century were the "age of turbulence" in the sociopolitical environment, which causes any inference in the socioeconomic environment to be an exercise in futility.

Table 2. OLS/FGLS "auto" regressions

	(1) parliament	(2) parliament	(3) pres II
pres I	1.063***		0.902***
	(63.55)		(42.75)
pres II		0.879***	
		(29.88)	
Constant	-10.04***	-1.520	6.009***
	(-11.51)	(-1.03)	(5.46)
Observations	378	378	378
Adjusted R^2	0.915	0.703	0.829
AIC	1493.3	1782.6	1669.0

t statistics in parentheses

* $p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 2 presents results of regressions that could be called "autoregressions" as turnout rates are regressed on turnout rates of other elections. The elections that are within the scope of the enquiry were conducted within about a year (20 June 2010, 4 July 2010 and 9 October 2011), which makes them comparable as it is extremely unlikely that social conditions changed significantly within this

time. There are 3 regressions, each of them uses 378 turnout rates from NTS4 areas (powiat):

(1) the parliamentary turnout ("parliament") is regressed on the first stage of the presidential elections ("pres I"),
(2) the parliamentary turnout is regressed on the second stage of the presidential elections ("pres II"),
(3) the second round of the presidential elections is regressed on the first round turnout ("pres II" on "pres I").

Technically speaking, the first and the third regression is just a plain OLS regression, while the second one is a GLS (or "feasible generalized least squares") as the problem with heteroscedasticity in this regression was nontrival.

The results given in table 2 show clearly that the phenomenon of voting is highly persistent and goes nearly in a "one-to-one" manner in an environment of extremely significant coefficients. It must mean that voting decions are made upon some stable underlaying interdependencies between some socioeconomic parameters or are just a habitual activity (yet such explanation does not satisfy anyone; still there must be something that accounts for getting into such a habit).

Furthermore, it seems that parliamentary elections are much more similar to the 1st round of the presidential elections than the 2nd one, which is suggested by a much higher R^2 coefficient for 1st regression than for the 2nd one and by the fact that the regression coefficient is closer to unity in the 1st regression. The coefficient in the 3rd regression is lower than unity, which again shows that the second round is less popular among voters.

It all means that parliamentary elections and the first round of the presidential elections are subjected to similar trends and resemble themselves more than the presidential election with only 2 candidates. It is precisely in line with expectations and with results of Western countries. It is extremely likely that some voters in Poland (that are gathered in certain areas subjected to common socioeconomic conditions) are much more inclined to vote, which, not surprisingly, corroborates the hypothesis that voting depends on the social and economic situation. Although we should be cautious with drawing too far-fetched conclusions, it seems that people vote rather to announce their preferences than to choose instrumentally between two alternatives and this can be observed from the comparison between 1st and 2nd round of the presidential elections.

5.2. Cross-sections

The literature in the field offers several empirical findings about various socioeconomic features correlated with the propensity to vote. The empirical findings from Poland described in the previous subsection confirm that such correlated

features must exist. This section presents results of regressions in which turnout rates of parliamentary elections as well as both rounds of presidential elections are run on the same set of explanatory variables. Technically, all 3 models are FGLS regressions as the heteroscedasticity was present and OLS technique was inappropriate. The selection of regressors has been made on the basis of previous works and the theory; both were reviewed in previous sections. Table 3 contains the results of regressions and the precise description of all the variables is presented in the Appendix A.

It is important to note that the differences in economic significance between the coefficients of the 1st and the 2nd regression are not important. It corroborates the hypothesis that these two types of elections are particularly similar. Coefficients of the 3rd model are slightly different yet they do not differ in sign but only in the magnitude.

In general, the coefficients are in line with expectations but with 2 important caveats. Firstly, the impact of age is *precisely* contrary to what we could expect from the Western findings. The interdependence is highly nonlinear but instead of being an inverse U-shape it is U-shaped with the minimum around the age of 45-47. Secondly, the impact of religiousness is also parabolic while it was expected to be a rising monotonic function. The minimum is slightly above the mean value and the turnout rate takes the minimal value for areas with approximately 40% of the population attending church services on Sunday.

The role of social groups is of lesser importance in the light of the empirical evidence. Is should be expected that inhabitants of smaller cities, towns and villages should be more prone to social pressure yet the impact of the number of inhabitants is reverse. The same applies to such factors as the ratio of those employed in agriculture or industry, which are both traditional branches with some potential influence of trade unions in the latter. Nevertheless, there are significant differences between areas of Poland that experienced different historical background: those regions that were part of Germany before the Second World War and whose inhabitants came after the war mainly from the East of Poland have not developed the voting habit. The social bonds of those who were forced to move to the West were destroyed so there might be some social impact of social interactions on the other hand.

The number of new marriages, used as some kind of a proxy for a general number of married couples, does not affect the turnout significantly in economic terms taking into account small number of potential values it takes among observations. Nevertheless, it is statistically significant and the sign of the coefficient is in line with expectations. The same applies to the male/female ratio yet the variable has been dropped because of the lack of variation leading to high standard errors.

Table 3. FGLS regressions

	expected sign	(1) parliament	(2) pres I	(3) pres II
Constant		100.449*	94.350**	112.699*
		(2.336)	(2.777)	(2.185)
Kaczynski	+	0.099***	0.095***	0.176***
		(6.006)	(5.572)	(10.71)
das Reich	-	-2.242***	-2.305***	-1.822***
		(-6.381)	(-6.107)	(-4.510)
ln inhabitants	?	1.534***	1.052***	1.128***
		(5.706)	(4.148)	(3.985)
marriages	+	0.705*	0.668*	1.095***
		(2.376)	(2.329)	(4.066)
own business	?	0.582***	0.662***	1.029***
		(7.884)	(9.617)	(15.24)
ln remuneration	+	2.993**	1.979	3.754**
		(2.673)	(1.556)	(2.628)
agriculture	?	-0.162***	-0.110***	-0.053***
		(-10.280)	(-7.780)	(-4.000)
industry	?	-0.111***	-0.064***	-0.047**
		(-5.472)	(-3.424)	(-2.751)
age	+	-3.359	-2.490	-4.627**
		(-1.850)	(-1.826)	(-2.106)
age^2	-	0.037	0.026	0.050**
		(1.857)	(1.757)	(2.051)
religion	+	-0.369***	-0.316	-0.358***
		(-4.677)	(-3.659)	(-4.239)
$religion^2$	linear	0.004***	0.0039***	0.004***
		(5.274)	(0.3.976)	(5.126)
social assistance	?	-0.172**	-0.198***	-0.067***
		(-3.060)	(-4.159)	(-1.269)
ln unemployment	?	-2.973***	-2.089***	-1.313**
		(-6.521)	(-5.105)	(-2.794)
Observations		378	378	378
AIC		1566.6	1610.4	1579.2
Adjusted R^2		0.848	0.849	0.774

t-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finally, there is a clear effect that the economic adversity has on the turnout rate. The inspection of the data is in favor of the hypothesis of withdrawal caused by unemployment. The rate of people helped by the social assistance confirms it too, as well as the average wealth level of the area. Finally, and probably most interestingly, there is a very significant effect of the ratio of those having their own business. Contrary to the opinion that those working on their own can have a high opportunity cost of gathering information or voting in general, the impact of owning a business is clear and positive.

Finally, the political differences between areas are present. The idea of plain inclusion of the support rate into regressions has been widely criticised because of the fact that it can lead to endogeneity problem as the same factors can affect the support for a certain politician and the process of making decision whether to vote or not. Unfortunately, the data set does not offer other possibilities to measure the impact of political bias in Poland and one can hope that the endogeneity problem is not grave. There is a clear concentration of support for J.Kaczyński that is most pronounced in the southern and eastern regions of Poland yet, fortunately, the correlation between the support and other socioeconomic variables is not particularly high so, even in case of some endogeneity, the problems should not affect the model much. Basing on the model, it cannot be inferred automatically (although it seems to be probable) that J.Kaczyński supporters are more inclined to vote – the model says only that in areas in which the support for J.Kaczyński is higher the turnout is higher as well. It can be the case that in such areas this can be tantamount to the "close election" situation in majoritarian electoral system and act as an incentive to vote for other voters.

6. Micromodel

An analysis of the microdata can corroborate or debunk conclusions drawn from the macromodel, although it must be kept in mind that the quality of micro data is not flawless so the inference must be done with some caution. Technically, the four models are all binary logit models with robust errors and with "zero" meaning abstaining and "one" attending the elections. There are two dependent variables: the participation decision for the first and second round of presidential election and four models as these two variables can be regressed on constrained and a full set of explanatory variables. The results are presented in table 4. Moreover, for the ease of interpretation and comparison there is table 5 containing odds ratios.

Firstly, it is worth pointing out that there is a consensus about the fact that modelling behavior of aggregated entities is easier than of individuals. It is conspicuous if we compare R^2 of the micromodels with those of macromodels

and we should note that many variables are not statistically significant. Besides that, the constrained set of variables consists of sociodemographic factors with one declaratory variable ("economic liberalism" describes the attitude towards socialism-liberalism), while the extended set consists also of other indicative variables that present just opinions and stances of respondents. It is crucial to note that these factors are much more important in assessing if an individual is more likely to vote or not than the sole socioeconomic variables.

Generally speaking, socioeconomic factors have signs that are consistent with expectations based on the theory or previous empirical investigation. Nevertheless, it is striking that so many of these factors are either statistically or economically unimportant. 1865 seems to be a sample that is big enough to demand comparatively high t-values. Only 3 factors are statistically important: age, education and religiousness, all with some considerable economic impact. In case of age, the micromodel is only partially consistent with the macromodel as there is monotonic relationship with the turnout. Religiousness ratios give same conclusions across models as they suggest the U-shape interdependence with the minimum again around the mean. Interestingly, the indicator of political stances, i.e. variable "economic liberalism", suggests that there is no systematic difference between supporters of various political programs.

An inspection of the extended model gives interesting findings. It must be pointed out that nearly all the additional factors give signs that are expected and are extremely significant in both statistical and economic terms. Those who treat voting as a civic duty or perceive the act of voting as important for the shape of national policy are much more inclined to cast a vote. Interestingly, there is a big difference in the coefficient between the 1st and 2nd round of the elections: people perceiving that voting is a duty vote more often in the 1st round. Does it mean that they vote for expressive purposes and in the 2nd round they cannot vote for their favourite candidate? The same would apply for the fact that having a favourite party makes people vote more often but in the second round the impact is less pronounced, probably because of the reason that has been just mentioned. The voting ease is the most important factor affecting if someone is going to vote or not. Although the answer to the question whether visiting the voting station is difficult states that for about 92% of the surveyed it is easy, those who claimed the opposite are much less likely to vote. Moreover, the negative impact of the variable is more pronounced for the 2nd round of the election. It seems to be an additional evidence in favour of the expressive voting theory: in the first round it is worth voting even if it is difficult as one can vote for the favourite candidate.

Table 4. Logit regressions

	expected sign	(1) pres I	(2) pres II	(3) pres I	(4) pres II
Constant		-3.239***	-4.658***	-2.341*	-4.798***
		(0.000)	(0.000)	(0.016)	(0.000)
female	+	-0.188	-0.144	0.0689	0.110
		(0.083)	(0.185)	(0.576)	(0.376)
married	+	0.163	0.101	0.0166	-0.0775
		(0.144)	(0.369)	(0.896)	(0.538)
ln age	+	0.651***	1.001***	0.241	0.736***
		(0.000)	(0.000)	(0.165)	(0.000)
education	+	0.146***	0.181***	0.0580*	0.104***
		(0.000)	(0.000)	(0.016)	(0.000)
unemployed	?	-0.245	-0.304	-0.314	-0.395
		(0.179)	(0.104)	(0.136)	(0.064)
town size	?	0.0701*	0.0379	0.0340	-0.00796
		(0.024)	(0.225)	(0.334)	(0.820)
religious	+	-0.0203	-0.107	-0.120	-0.216
		(0.887)	(0.455)	(0.483)	(0.203)
religious^2	linear	0.0193	0.0300*	0.0266	0.0384*
		(0.198)	(0.047)	(0.132)	(0.029)
economic liberalism	?	-0.00640	0.0123	-0.00968	0.0134
		(0.751)	(0.548)	(0.675)	(0.567)
voting importance	+			0.140**	0.168***
				(0.001)	(0.000)
favourite party	+			0.801***	0.778***
				(0.000)	(0.000)
pivotal voter	+			0.350*	0.504***
				(0.011)	(0.000)
voting easeness	+			1.058***	1.295***
				(0.000)	(0.000)
voting duty	+			1.193***	0.974***
				(0.000)	(0.000)
gifts for voting	+			-0.190**	-0.223***
				(0.001)	(0.000)
political knowledge	?			0.170*	0.191**
				(0.011)	(0.004)

interest in politics	-		-0.353***	-0.266***
			(0.000)	(0.001)
Observations	1865	1865	1865	1865
AIC	2266.3	2252.4	1931.4	1929.4
pseudo R^2	0.0541	0.0749	0.2019	0.2154

p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Odds ratios

	(1)	(2)	(3)	(4)
	pres I	pres II	pres I	pres II
female	0.829	0.866	1.071	1.116
	(0.083)	(0.185)	(0.576)	(0.376)
married	1.177	1.106	1.017	0.925
	(0.144)	(0.369)	(0.896)	(0.538)
ln age	1.917***	2.721***	1.272	2.088***
	(0.000)	(0.000)	(0.165)	(0.000)
education	1.158***	1.199***	1.060*	1.109***
	(0.000)	(0.000)	(0.016)	(0.000)
unemployed	0.783	0.738	0.731	0.674
	(0.179)	(0.104)	(0.136)	(0.064)
town size	1.073*	1.039	1.035	0.992
	(0.024)	(0.225)	(0.334)	(0.820)
religious	0.980	0.898	0.887	0.806
	(0.887)	(0.455)	(0.483)	(0.203)
religious^2	1.020	1.030*	1.027	1.039*
	(0.198)	(0.047)	(0.132)	(0.029)
economic liberalism	0.994	1.012	0.990	1.014
	(0.751)	(0.548)	(0.675)	(0.567)
voting importance			1.151**	1.182***
			(0.001)	(0.000)
favourite party			2.227***	2.177***
			(0.000)	(0.000)
pivotal voter			1.420*	1.656***
			(0.011)	(0.000)
voting easiness			2.882***	3.649***
			(0.000)	(0.000)
voting duty			3.295***	2.647***
			(0.000)	(0.000)

gifts for voting			0.827**	0.800***
			(0.001)	(0.000)
political knowledge			1.185*	1.211**
			(0.011)	(0.004)
interest in politics			0.703***	0.766***
			(0.000)	(0.001)
Observations	1865	1865	1865	1865

Exponentiated coefficients; p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The information does affect the voting decision. Those who are better informed are more likely to attend voting and it is visible both in subjective and objective measures of information: those who declare more interest in politics are more likely to vote (the variable in the model is rather counterintuitive and it should be perceived as "political disinterest"; the lower the coefficient the more interested in politics one is) as well as those who answer some questions regarding their political knowledge.

The last factor worth mentioning is the fact that those who have experienced directly or indirectly some material gifts for the very act of voting are less likely to vote. It can mean that people perceive voting as a "pure" act of civic duty and do not want to connect it with direct bribes or any other direct material rewards. Obviously it does not preclude voting for getting some preferential treatment in the pension system etc. yet such decisions must be made in the official and democratic parliamentary framework.

7. Conclusions

The aim of this paper was to establish main trends and findings in the area of electoral economics in Poland. To the best knowledge of the author there is not existing literature in the field, which means that this article can be, at least to some extent, useful as a basis for potential more profound research. Although the results are mostly in line with results established in Western democracies there are some differences that are worth noting as well as general conclusions.

Generally speaking, it seems that voting is attributable to educated and wealthy citizens, which is precisely in line with the opinion of Lijphart (1997). Moreover, economic hardship affects voting negatively while demographic variables such as sex or marital status are ambiguous. The impact of age is significant and in individual terms older people are more likely to vote, while in aggregated data both older and younger people tend to vote contrary to middle aged ones. The age effects could be explained by the fact that middle aged people are dis-

illusioned by the standards of a new democracy and the transformation process and young people from bigger cities and with better educational status have more positive attitude towards democracy. The same argument can be repeated in case of religiousness: those who are least religious tend to show more civic behavior as well as those most religious. Those in between can be perceived as "ordinary" members of society for whom attending church services is just a habit that does not involve changing their social behavior.

It all shows that the act of voting needs some social capital that is accumulated through education or some positive social interaction. The results of education are visible both in terms of civic duty obligation, better access to information and a better situation on the labor market. The impact of social groups does not seem to be so important, with some exceptions to the role of the church.

In the light of the research, there is some evidence that Polish voters choose whether to vote on the basis of the expressive voting theory as well. Nevertheless, some elements of the instrumental voting approach are also present. It can lead to conclusions that there should be an eclectic theory embracing two theoretical models.

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Co wpływa na frekwencję wyborczą? Mikro i makroekonomiczna analiza empiryczna

Streszczenie

Celem artykułu jest ustalenie roli czynników społeczno-ekonomicznych wpływających na kształtowanie się frekwencji wyborczej ze szczególnym uwzględnieniem roli bezrobocia i innych zmiennych związanych z rynkiem pracy. W pracy podjęta zostałą próba skonfrontowania wyników badań w Polsce z wynikami uzyskanymi w krajach o dłuższej tradycji demokratycznej. Dodatkowo, podjęta została próba odpowiedzi na pytanie jakie koncepcje teoretyczne wyjaśniające powstawanie niezerowej frekwencji wyborczej mogą sprawdzać się w Polsce. Empiryczna część artykułu opiera się o ekonometryczny model liniowy stworzony na danych pochodzących ze wszystkich polskich powiatów dla zmiennej objaśnianej jaką są frekwencje w wyborach parlamentarnych w 2011 oraz dwóch turach wyborów prezydenckich w 2010 roku. Drugim modelem empirycznym jest model logitowy oparty na danych pochodzących z ankiety "Polskie Studium Wyborcze", w której ankietowani deklarowali udział w wymienioncyh wyborach.

Słowa kluczowe: wybory, frekwencja wyborcza, bezrobocie, głosowanie ekspresyjne, głosowanie instrumentalne.

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A Macromodel

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Table 6. Summary statistics of macrodata

Variable	Mean	Std. Dev.	Min.	Max.
turnout parliament	45.134	5.953	33.4	67.75
turnout presidential I	51.89	5.355	37.84	68.930
turnout presidential II	52.837	5.306	38.94	70.63
kaczynski	49.367	14.068	16.05	82.900
das reich	0.291	0.455	0	1
preussen	0.198	0.399	0	1
russia	0.378	0.486	0	1
austria	0.132	0.339	0	1
inhabitants	101.852	116.864	21.04	1708.49
male	48.908	0.883	45.493	51.120
marriages for 1000	5.47	0.521	4.16	7.270
social assistance	9.542	3.744	2.2	22.9
own business	10.31	2.774	5	20
remuneration	3062.23	448.281	2224.07	6324.79
unemployment	15.542	6.094	3.6	37.1
long unemployment	33.661	7.774	6.5	54.9
agriculture	30.394	20.596	0.35	78.92
industry	28.831	11.725	3.5	71.600
inferior services	14.231	6.731	3.3	40.33
superior services	2.335	1.623	0.39	12.99
other services	24.209	7.899	9.07	45.37
age	44.855	2.348	38.46	54.45
religion	40.583	10.055	25.4	70.5
Observations	378			

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The appendix contains a brief description of the data used in the macro regressions. All variables pertain to the NTS4 (powiat) areas and to 2010 and 2011, depending if the model describes the turnout of the presidential or parliamentary elections. All ratios are stated in 0-100 interval. The data has been taken from such sources as State Statistical Office (Główny Urząd Statystyczny), State Election Commission (Państwowa Komisja Wyborcza) and Catholic Statistical Institute (Katolicki Instytut Statystyczny).

turnout parliament, presidential I, presidential II turnout during the parliamentary elections in 2011, the first round of the presidential elections in 2010 and the second round of presidential elections in 2010, respectively, measured as the ratio of all casted ballots to the number of all eligible persons.

kaczynski the ratio of J. Kaczyński supporters during the second round of presidential elections in 2010.

das reich, preussen, russia, austria binary variables taking the value 1 if the area was part of Germany in 1939 or part of Germany, Austria or Russia in 1914, respectively.

inhabitants the area population, given in thousands.

male the ratio of males to the whole population.

marriage the number of new marriages in the given area. Calculated as the ratio to 1000 inhabitants.

social assistance the ratio of inhabitants receiving help from the social services.

own business the ratio of those having own business to 100 inhabitants.

remuneration average gross remuneration in PLN.

unemployment the official unemployment rate in June 2010 and November 2011 respectively.

long unemployment the ratio of the unemployed without a job for at least 1 year to the whole number of unemployed.

agriculture, industry, inferior/superior/other services the ratio of people working in the agriculture, industry and various services respectively to the whole number of employed.

age the average age in the area.

religion the ratio of those who attend catholic church services on Sunday to the 80% of the area population. Reported by Catholic Statistical Institute (Katolicki Instytut Statystyczny).

B Micromodel

The appendix contains a brief description of the data used in the logit regressions. All variables have been taken from the survey Polish General Electoral Study 2011 ("Polskie Generalne Badanie Wyborcze 2011"). The data is available on the website "Archiwum Danych Społecznych" www.ads.org.pl

presidential I, presidential II binary variable taking the value 1 if a person declared taking part in the first/second round of presidential elections in 2010.

female binary variable taking value 1 for females.

age age of a person in 2010.

religion variable taking values 1 to 8. It answers the question "how often do you attend church services?" with the answer "1 - never" and "8-more than once a week".

married binary variable taking value 1 for a married person.

education variable taking values from 1 to 12 and describing the educational

status of a person. The answer 1 means no education or partial primary school education and 12 means a PhD degree or a higher scientific degree.

Table 7. Summary statistics of microdata

Variable	Mean	Std. Dev.	Min.	Max.
presidential I	0.667	0.471	0	1
presidential II	0.653	0.476	0	1
female	0.549	0.498	0	1
age	47.006	17.327	17	85
religious	5.434	1.818	1	8
married	0.617	0.486	0	1
town size	2.915	1.852	1	6
education	5.835	2.957	1	12
unemployed	0.083	0.275	0	1
voting importance	3.569	1.402	1	5
economic liberalism	4.343	3.957	0	10
favourite party	0.357	0.479	0	1
pivotal voter	0.317	0.465	0	1
voting easiness	0.923	0.266	0	1
voting duty	0.851	0.356	0	1
gift for voting	1.476	0.942	1	5
political wisdom	1.743	1.086	0	4
interest in politics	3.487	0.999	1	7
Observations	1865			

unemployed binary variable taking value 1 for unemployed.

town size variable taking values from 1 to 6 with the answer "1- village" and "6- city with more than 500.000 inhabitants".

voting importance variable describes the person's perception if the act of voting can change anything on the political scene. 1 means that voting cannot change anything while 5 that it can change a lot.

economic liberalism variable describes the attitude towards the idea of liberalism and social solidarity. 0 means that a person strongly prefers social solidarity and 10 means that he/she prefers economic liberalism.

favourite party binary variable taking value 1 for a person that declares having a favourite party.

pivotal voter binary variable describing the subjective probability of being a pivotal voter for a given person. The answer 1 means "there is a big chance that I can be a pivotal voter" while the answer 0 means "there is no chance that I can be a pivotal voter or this chance is slim".

voting easiness binary variable describes how difficult it is to get to the voting station. 1 means that it is very easy or easy and 0 that it is very difficult or difficult.

voting duty binary variable that takes value 1 if a person perceives voting as a duty of every citizen.

gift for voting variable states if a person believes that voting can be connected with direct rewards, gifts or bribes received from politicians. 1 means that a person perceives such possibilities as impossible while 5 means that he/she has experienced such situations personally.

political wisdom variable taking values from 1 to 4 and describing the knowledge of a person about international and home politics. The variable takes value 4 if a person has answered correctly to all 4 questions. The questions were given with 4 answers to choose yet a large fraction of people decided not to answer the questions at all.

interest in politics variables describes the interest in politics with following possibilities: "1 - very interested" and "5 - not interested at all" with other possibilities in between.