Voting Behaviour in Hungary – Are Voters Sophisticated Optimisers or Clueless Rubes?

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1 Introduction

The central importance of relationships among electoral outcome to the wealth of nations and the well-being of people has attracted much interest among academic researchers for many years (Ashworth, 2012; Healy and Malhotra, 2013). As a leading political economist, Tufte (1978, 65) famously claimed *"When you think elections, think economics*". In the last few decades, economists and political scientists have examined the economics and elections connection, often referred to as *economic voting*.

Scholars have extensively documented correlations or sometimes causal relation between economic indicators and election outcomes. Three broad theoretical models of voting behaviour emerged that explain these empirical patterns. The first two are best described by a reward-punishment model that accords with a rational choice framework, while the third is rooted in psychological biases. *The first explanation* within the rational choice theory suggests that voters (principals) are attempting to reduce moral hazard on the part of elected representatives (agents) (Downs, 1957; Key, 1966). Accordingly, voters see elections as referenda, punishing incumbents if they presided over poor economic times and rewarding incumbents for a strong state of the economy (Kramer, 1971). By this process, voters incentivise politicians to pursue the best economic interest of the country as well as of the individuals. *The second model* – again within the rational choice framework – sees economic voting as a process that ensures the selection of a leader who perform most competently after being elected (Fearon, 1999). Within this model, voters not only punish or reward politicians based on the current or past economic achievements but they strive to learn about an incumbent's quality through his or her performance in office and based on this information, they make an optimal decision for the future. As a result, voters either re-elect the most competent leader or support an unknown challenger from the opposition. According to the first two models, elections serve the process of selecting good performers, and – in the language of rational choice theory – it reduces moral hazard and adverse

selection (Healy and Malhotra, 2013). Finally, *the third model* accounts for an individual's cognitive and emotional biases and argues that voters are not able to process all relevant information. Voters rather use heuristics to make decisions and rely on cognitive shortcuts that might lead voters to make optimal economic decisions but sometimes lead them astray. Indeed, some argue that heuristics of voters might be reasonable guides in most cases (Lau and Redlawsk, 2001), while others claim that heuristics can also produce significant mistakes (Bartels, 2016). Arguably, the beauty of the reward-punishment model lies in its simplicity and the reward-punishment approach remains the superior explanation within the economic voting literature.

Within the economic voting literature, scholars have developed an interest in considering whether voters are actually looking at the state of the aggregate economy in voting *(sociotropic voting)*, or whether they are examining their own personal economic situation and individual concerns *(pocketbook voting or egocentric voting)*. Additionally, there is a debate on whether voters are looking backwards or forwards in time and whether citizens evaluate previous economic trends *(retrospective voting)* or expected future economic trends *(prospective voting)*. Nonetheless, the economic voting literature is rife with inconsistencies. While the survey-based literature concludes that voters care more about national (sociotropic) than personal (pocketbook) economic conditions, backward-looking, and myopic (Fiorina, 1981a; Kiewiet and Lewis-Beck, 2011), the macro-based literature finds that voters are driven by pocketbook considerations and that they are largely forward looking and highly capable of disciplining incumbents for economic outcomes (Erikson, MacKuen and Stimson, 2000).

The first main contribution of this dissertation is to test all aspects of the economic voting literature and to see whether voters are driven by sociotropic versus pocketbook considerations; or whether they assess the past or look forward and gauge the future. As such, the first main objective is to conduct confirmatory research. The first half of the dissertation aims at confirming or rejecting the main premises of the economic voting literature

and does not intend to challenge a gap in the literature or to construct new hypotheses. Confirmatory research is still valuable given that the economic voting literature is rife with inconsistencies and with contradictory results. Therefore, *precisely testing and estimating* the effect of economic variables might bring some clarity in the empirical literature. There is a consensus in the literature that some of the inconsistent results are due to imperfect data. Almost all of the evidence about the individual level effects of economic circumstances comes from survey questions that are elicited at only a single point in time: right before or right after an election. This is potentially problematic, as partisan preferences, limited human memory, and other factors might challenge subjective assessments (Wlezien, 2015). On the other hand, macro data obscures individuals, while a very aggregate "local" contexts are often geographically vast and therefore at best imprecise proxies for local experiences (Dinesen and Sønderskov, 2015; Moore and Reeves, 2020).

Using a unique dataset, this dissertation aims at painting a full picture of the economic voter and at testing the economic voting premises. We rely on an extremely granular data, on a long repeated cross-sectional individual surveys with 108 442 face-to-face individual level interviews between 2006 and 2018 in Hungary. This dataset allows us to achieve two main objectives. First, this dataset enables us to test all four economic premises on one dataset and to precisely estimate the effect of sociotropic voting, pocketbook voting, retrospective voting as well as prospective voting in one single regression so that none of the economic voting variables are omitted from the calculus. Many papers test only one of the economic voting hypotheses and leave the other variables in the error term. This is potentially problematic as the omitted variables in the error term might be correlated with the observed explanatory variable that bias estimates in directions that are ambiguous *ex ante*. By specifying a regression equation that is potentially able to control for omitted variable bias, we are more confident in confirming or rejecting the leading economic voting hypotheses using Hungary as a case study. Second, this dataset also allows us to estimate how the relative importance of the four economic voting hypotheses were changing over

time and relative to each other. We therefore show the changing importance of the economic considerations of voters over time. As such, this dissertation does not aim to place Hungary in a comparative perspective nor does it seek to understand why we see certain patterns in the estimated effects: it merely shows an unbiased estimation of all four variables over time. This confirmatory research might help researchers to think more carefully about what variables to include in a regression equation.

While the objective of the first contribution is to include all aspects of economic voting variables in one regression and hence to avoid leaving any of the economic considerations in the error term, it still focuses on individuals' *perceptions* on economic circumstances that might introduce another bias in the estimation. Therefore, **the second main contribution** of this piece is to provide an unbiased estimation on voters' sociotropic considerations by relying on a source of exogenous variation. A widely cited problem with cross-sectional designs arises when a covariate in an estimating equation is correlated with the error term and as a result, this correlation will produce a biased and inconsistent estimate of the effect of that covariate. In economic voting models, these biases may occur because of endogenous relationships between a measure of party preference and the evaluations of national or personal economic conditions over retrospective or prospective time horizons. For instance, party support (partisan attachments, vote intention or the vote itself) colours voters' attitudes about economic conditions that leads voters to view the same economic events more favourably if their preferred party is in office. In other words, voters' judgement on economic conditions are led by whether they support or oppose the incumbent party. That is, voters decide who they are going to vote for, and then report an economic evaluation that conforms with that choice (Chzhen, Evans and Pickup, 2014; Duch, Palmer and Anderson, 2000; Evans and Andersen, 2006; Pickup and Evans, 2013). Some empirical papers have attempted to overcome the issue of endogeneity problems in several ways. For instance, one possible empirical solution is to use pre and post election panel data, with all covariates measured in the pre-election wave panel and voting reports measured in the post-election

wave. The idea being is that if voters cast their ballots on election day, then the act of voting could not have caused pre-election responses to economic evaluations. Another way to overcome reverse causality is to use objective measures rather than subjective assessments of economic conditions (Van der Brug, Van der Eijk and Franklin, 2007). Others are concerned with identifying (potentially exogenous) economic shocks that hit one segment of the society and compare how this segment (a potential treatment group) is different to the rest of the groups in the society (a potential control group). Finally, a prominent paper by Healy, Persson and Snowberg (2017) – that also motivated our research – use personal financial data from tax records (more precisely changes in disposable household income) as an exogenous source of variation for individuals' perception on their own financial situation.

To complete this task, this dissertation merges the survey data with national and local economic measures between 2006 and 2015 that is in many ways superior to data used in existing research. The dataset is designed at individual and survey wave level and includes relevant local economic measures (such as changes in settlement level income and changes in settlement level unemployment rate) as well as national economy measures (such as GDP growth or changes in unemployment measures). This unique dataset allows us to predict the exogenous variations in individuals' national perception measures and thus to provide an unbiased estimation. It further enables us to test how changes in objective economic measures at local as well as at national level explain individuals' perceptions and in turn their party preferences. This idea resonates with the identification strategy of Healy, Persson and Snowberg (2017) who also argue and empirically show that changes in an individual's household disposable income affect party preferences but only through perception on individuals' own financial circumstances. Similar to this idea, we use the most widely cited objective, economic measures in the literature (Fidrmuc, 2000; Roberts, 2008; Tucker, 2001) and first rely on two *local level* objective measures: changes in income level at settlement level as well as changes in unemployment rate. We then turn to *national*

level macroeconomic variables: GDP growth rate and changes in the unemployment rate as potential sources of exogenous variations in the perception on national economy. In other words, to precisely estimate the effect of individuals' perception on national economy and on their party preferences, we rely on the exogenous variation in the perception variables: changes in objective economic variables both at local and at national levels. This dataset is unique in the literature because 1) the objective economic measures have an extremely low level of aggregation (the median settlement in our data set has less than 700 eligible voters); 2) we link individuals' perception on the economy to their micro environment as well as to the macro environment; 3) in contrast to most of the economic measures that are observable at such a low level of aggregation, this administrative data are measured without sampling error.

Distinguishing between three periods following the Hungarian four-year term length (that is between 2006 and 2010; 2010 and 2014; and 2014 and 2018) the main results suggest that on average, 1) pocketbook voting has strong explanatory power in Hungary between 2014 and 2018; 2) the importance of sociotropic voting remains – roughly equally – significant in all three periods; 3) retrospective and prospective voting on the national economy explain party preferences with the former having the stronger effect. Evaluating the changing importance of the economic voting variables over times, we find that 1) the relative importance of retrospective voting in explaining support for the incumbent party is larger in 2014–2018 than in 2010–2014; 2) pocketbook voting has strong explanatory power in Hungary between 2014 and 2018, but not before; 3) the importance of sociotropic voting remain – roughly equally – significant in all three periods.

Second, turning to two stage least squares estimation, there are two main results worth noting here. First, Ordinary Least Squares (OLS) regressions systematically overestimate the effect of individuals' perception on their own national economy on party preferences. If we only rely on the variations in perception that is estimated by the changes in the actual and objective measures, we calculate a smaller – in magnitude – coefficient. It has

important implication for the survey-based literature that makes conclusions based on only subjective perception measures. Second, the fit of the first stage is strongest when we rely on national level macro measures only, that implies that perception on national economy is indeed driven by national level macro measures (such as GDP growth rate and changes in unemployment rate) and not by local level economic variables.

The relevance of this paper is rather straightforward. First, political scientists as well as economists take advantage of the unprecedented quantity of available information on economy and voting behaviour. Based on a wide variety of dataset, scholars make important conclusion and articulate striking implications about the effect of economy on voting behaviour. Nonetheless, one of the main punchlines of this dissertation is that our understanding of economic voting depends crucially on the quality of available data and on the empirical strategy. Second, economic voting is a crucial component of democratic accountability. As the punish-reward model suggests, the process of voting indeed incentivises politicians to satisfy voters by growing the economy, and allows voters to sanction politicians who do not perform well via regular elections. Thus, understanding whether voters judge politicians for economic performance is crucial for any assessment of representative democracy.

The rest of the dissertation is organised as follows. Section 2 summaries the literature along the debate on voters' pocketbook *versus* sociotropic considerations; along the findings on retrospective *versus* prospective voting; while it also explains the main limitations of the economic voting literature. Section 2.3 on limitations leads us to the endogeneity concerns that is discussed in Section 2.3.1. Section 2.4 overviews the literature in search of causal relationship, and groups the literature based on the main empirical approaches.

Sections 3.1 and 3.2 overview the Hungarian political and economic landscape over the period of the research. Section 4 describes the variables, data and definitions, while it also presents correlations between the main variables in interest. Section 5 presents the key empirical findings that contribute to the first main objective of the dissertation. Section 6

turns to the two stage least square estimations and explains the main findings. The final section summarises the main lessons.

2 Literature on Economic Voting

2.1 Pocket Voting and Sociotropic Voting

A large portion of the economic voting literature attempts to discern whether voters have pocketbook or sociotropic motivations, settling on the latter (Fiorina, 1981b; Kiewiet and Lewis-Beck, 2011; Martin, Thisted and Mannemar, 2016; Nadeau, Lewis-Beck and Bélanger, 2013). Traditionally, these two views were regarded observationally equivalent at the aggregate level, with the assumption that an improving aggregate economy implies that most individuals notice an improvement in their personal finances (if national wealth is distributed reasonably uniformly). In highly influential early works, Kiewiet and Rivers (1984) and Kinder and Kiewiet (1981) use individual survey data and argue that voters see the national economy as an indicator of the incumbent's ability to promote (eventually) their own economic welfare. Kiewiet and Rivers (1984), however, acknowledge the theoretical limitations of using one's own pocketbook and point out that "[if] a distant relative dies, leaving a substantial inheritance, does the lucky recipient attribute his or her good fortune to whoever happens to be in the White House at that moment?" (page 381). The authors provide empirical evidence that respondents' national evaluations are not simply functions of their personal experience and that the state of the national economy might be a better predictor of an individual's future well-being than the individual's own recent economic performance.

Later, in the 1990s, survey research on economic voting has became very influential that provided further evidence for voters' sociotropic considerations. Survey based papers overcome the issue of inferring individual behaviour from the observation of aggregate relationships, while the nature of the datasets also allows researcher to examine the individual heterogeneity of the economic vote (Welch and Hibbing, 1992); to test whether economic *versus* non-economic issues drive voters' decision (Alvarez and Nagler, 1995); and to look at the relationship between economic circumstances and vote share depending on the political

sophistication of an individual (Godbout and Bélanger, 2007).

The proposition that sociotropic considerations rather than pocketbook voting consideration drive voters receive clear support in recent researches relying on a wide variation of data and estimation strategies. In their paper, Duch and Stevenson (2010) look at the question of how voters react to an unexpected economic shock. They argue that voters are able to determine the extent to which these shocks are the result of the incumbent's competencies and able to assess the unexpectedness of the shock. Therefore, voters are able to weight the importance of shocks in their vote decision. Relying on six-nation survey from Great Britain, Spain, Denmark, France, Italy, and Germany and then examining economic time series from 19 countries over the 1979–2005 period, they demonstrate that variances in the macroeconomic measures explain variations in the economic vote. Finally, the authors show that in countries with open economies – which are more subject to exogenous economic shocks – economic voting has smaller explanatory power than in those economies that are less dependent on global trade. Nadeau, Lewis-Beck and Bélanger (2013) focus on ten European countries polled four times between 1988 and 2004 and provide evidence for sociotropic voting patters. In particular, they find that if voter's sociotropic perception changes from "worse" to "better", there is an increase in the support of the incumbent from 19 to 35 percent. Foucault, Seki and Whitten (2017) look at the impact of tax policy on vote share in 21 countries. Their finding show that tax policies have a statistically significant effect on left-wing parties' support, with the relationship moderated by the extent of clarity of responsibility, government ideology, and whether or not there has been a recession in the year before an election. In a recent paper, Jacques and Haffert (2021) examine the political effects of fiscal consolidations and look at the question of whether consolidations reduce the voters' support for the incumbent party. They conclude that electoral outcomes cannot reflect well the effect of a policy as electoral outcomes are affected by the strategic timing of consolidations or by the political alternatives on offer. Based on a cross-sectional comparative study, Quinlan and Okolikj (2020) examine the impact of eco-

nomic policy preferences on the vote in 32 states. They offer empirical evidence that voters economic preference on income redistribution and spending directly impact vote choice, while they also find that positional economic voting is more likely to take hold in mature democracies. Dassonneville and Lewis-Beck (2019) question whether the reward-punish model is stable and if so up to what degree. Focusing on Denmark, Germany, Great Britain, Italy, the Netherlands, Norway, and Sweden, they estimate the vote share of the incumbent government at the individual as well as at aggregate levels. They find that the process of economic voting is stable over time, and voters act in line of the theory at ballot box.

While these papers confine themselves in the United States and/or in Europe, basic finding holds for democracies in other regions. For instance, Bratton, Bhavnani and Chen (2012) show that voters are rewarding or punishing the government according to how they perceive government performance in sub-Saharan African democracies; Lewis-Beck and Ratto (2013) survey research on twelve Latin American democracies and find that a shift in sociotropic economic perception from "worse" to "better" increased the likelihood of an incumbent vote by 21 percent.[1]

Empirical papers using different estimation strategies support the proposition that sociotropic economic voting exercises more influence than egotropic economic voting on voters' decision. For instance, Anderson (2000) test this claim by using pooled survey analysis of thirteen European nations; Duch and Stevenson (2008) rely on 165 surveys from nineteen countries; or Nadeau, Lewis-Beck and Bélanger (2013) conduct a pooled survey investigation (ten European nations polled four times, 1988–2004). In a prominent paper, Healy, Persson and Snowberg (2017) rely on a dataset covering the 2010 Swedish election and the previous four years of personal income. They demonstrate that pocketbook considerations are just as important as sociotropic ones and show that both pocketbook and sociotropic

[1]Some explains the triumph of sociotropic voting over pocket voting with the public interest motivation of voters, while others claims that voters are self-interested, and the apparent importance of sociotropic evaluations occurs because the national economy is a clearer signal of governmental performance than personal economic experiences (Ansolabehere, Meredith and Snowberg, 2014; Elinder, Jordahl and Poutvaara, 2015).

evaluations include partisan bias, however, that bias is twice as large in sociotropic evaluations.

Hypothesis 1: Sociotropic economic voting exercises more influence than pocketbook economic voting.

2.2 Retrospective Voting, Local Economic Voting and Prospective Voting

The literature also considers whether voters assess the past or look forward and gauge the future. Much ink has been spilled on questions whether voters vote retrospectively, assessing past economic performance, or whether they vote prospectively, basing votes on expectations of the future. Retrospective voting predicts that the mass public incentivise politicians by rewarding elected officials for strong economic performance and punish them for a weak economy (reward-punishment, or sanctioning model).

Traditionally, papers look at conventional macroeconomic measures, such as unemployment and economic growth rate to test the premisses of retrospective voting. In an early study, Goodhart and Bhansali (1970) focus on the case of the United Kingdom and provide evidence for the effect of unemployment on politics and on party support. Chappell Jr and Veiga (2000) analyse 136 Western European elections and find evidence for the punishment mechanism. In particular, the authors show that an increase in the inflation rate leads to a decrease in the incumbent's party support. Another early study by Powell Jr and Whitten (1993) conducts a comparative analysis and finds that unemployment and growth rate are the key macroeconomic variables that explain pattern in voting behaviour. Indeed macroeconomic variables such as growth and unemployment appear as important explanatory variables in papers focusing on different part of the words, such as on Central and Eastern Europe (Fidrmuc, 2000; Roberts, 2008; Tucker, 2001) or on Latin America (Benton, 2005).

The main criticism against this branch of the literature is that explaining voters behaviour

with a national level variable is vast and imprecise. The literature is nearly unanimous in finding that the performance of the economy is not uniform across geography and these geographic differences do matter (de Benedictis-Kessner and Warshaw, 2020). While the economy might be booming at the national level, and while the general tendencies in some macroeconomic measures are favourable, certain regions or industries might be declining. de Benedictis-Kessner and Warshaw (2020, 663) argue that looking at national level measure only is problematic as it "*...can lead to vast differences in the meaning of economic performance for people who live in different areas. This presents measurement problems in a theory of economic voting*". While looking at the national economy might be an easy cue to learn about the general economic situation, voters tend to rather form their opinion about the economy based on cues that are closer to home, such as county level or settlement level economic performance, or their own personal finances over time.

For a number of decades, there was a noisy debate in the literature about whether voters held incumbents accountable for local economic conditions (Wright, 2012; Hill, Herron and Lewis, 2010). A very important contribution to this debate is provided by Healy and Lenz (2017) who show that the contradictory results in papers looking at the effect of the local economy on vote share in the United States are largely caused by a reliance on sample based-measures of economic performance. For instance, Wright (2012) uses estimates of county-level unemployment from the Bureau of Labor Statistics that calculates their measure based on population survey. Healy and Lenz (2017, 1420) point out that sampling error in these unemployment estimates "*can cause a county-level unemployment change to deviate from the truth by several percentage points.*" If there is measurement error in the estimates of unemployment, then it generates attenuate estimates of accountability.

Within retrospective voting, recent research indicates that voters may rely on local economic conditions as a shorthand for evaluating the national economy and in turn the performance of the incumbent (Healy, Persson and Snowberg, 2017; Simonovits, Kates and Szeitl, 2019). Focusing on local rather than aggregate economic measures are important as

a very aggregate contexts, for instance census tracts in the USA, are often geographically vast and therefore at best imprecise proxies for how individuals across a country exposed to the economy (Dinesen and Sønderskov, 2015; Moore and Reeves, 2020). Similarly, Healy and Malhotra (2013, 290) argue that "*conditions prevailing in the local economy appear to bias people's perceptions of the national economy*. Exposure to local conditions may stem from direct, personal involvement with the local economy (e.g.: job search or buying or selling a home) and from more indirect casual observations (e.g.: changing supermarket prices) (Larsen et al., 2019). Many papers test voters' responsiveness to various local economic conditions, typically to local unemployment (Simonovits, Kates and Szeitl, 2019), to the number of loan delinquencies (Healy and Lenz, 2017) or to gas prices (Reeves and Gimpel, 2012). Another set of studies test whether various features of the local economy shape voter perceptions of the national economy, which is then expected to shape voters' assessment of the government (Anderson and Roy, 2011; Ansolabehere, Meredith and Snowberg, 2014; Hall, Yoder and Karandikar, 2021). A notable paper by de Benedictis-Kessner and Warshaw (2020) conducts an evaluation of retrospective voting for the local economy across all levels of government in the United States. Specifically, the paper examines whether voters are able to hold elected officials accountable for the economy in elections for President, Senate, House, governors, state legislators, and local offices. Their results suggest that local economic circumstances have a significant explanatory power in sub-national elections. Moreover, they claim that economic voting in state and local elections is more similar to economic voting in presidential elections than scholars have previously thought.[2] Another prominent paper by Healy and Lenz (2017) looks at the question of whether local economic conditions influence presidential election outcomes in the United States. They rely on two different datasets of local economic conditions. The first one is a zip-code level credit bu-

[2]For these models, the author linked voting and economic data to create a panel dataset for each level of government (totally 7 levels). The main independent variable is the change in economic conditions in each country between two consecutive years. In their main model, they use change in log local wages as independent variable. They interact this variable with a binary indicator for whether the incumbent is a Democrat or not (incumbent here can refer to president, governor, legislature, etc).

reau data on all consumer loans in California that enables the authors to examine loan delinquencies, including those for mortgages, leading up to the 2008 election. The second dataset provides measures of total wages and employment at the county level. The authors show that presidents face incentives to boost the economy in politically important regions even if this would harm the overall national level economy. By studying local housing markets in Denmark, Larsen et al. (2019) provide empirical evidence that the local context embodies information about the state of the national economy, although the importance of the local economy varies by voters' interactions with it. Reeves and Gimpel (2012) provide evidence that increase in county-level home foreclosure rate in the four months before the 2008 presidential election in the United States increased negative evaluations of the national economy and this affect was larger in states which were most directly affected by the housing crisis. They further show that local peak gas prices in the summer before the 2008 presidential election did not affect economic attitudes overall, but among independents increase in price of gas was associated with a decrease in the economic perceptions.

Hypothesis 2: Within retrospective voting, local rather than aggregate national economic conditions inform voters.

There is some consensus in the literature that prospective evaluations matter and do so more than retrospective considerations, but debate remains intense over this question. Early studies find that both business expectations and business retrospections have significant short-run effects on election outcome (Clarke and Stewart, 1994, 1992). Nadeau and Lewis-Beck (2001) point to the important role for retrospective evaluations and argue that voters weigh different aspects of the economy differently. They develop a national business index as a measure of retrospective evaluations and an economic future index (EFI) to quantify expectations and find that when both indices are in the model, each was significant, with retrospective assessments having a slightly larger effect than prospective assessments.[3]

[3]NBI is built from the following question: "Would you say that the present time business conditions are better or worse than a year ago?" The authors assign a score of 1 for better, -1 for worse, and 0 for same. They calculate the percentage in each category and subtract the percentage worse from better. EFI is built in the

They also show empirically that when the incumbent does not run in the election, voters are more forward-looking, while retrospective considerations prevail when an incumbent is running and there is a record to evaluate. Prospective evaluations, however, require a cognitive step beyond either retrospective, sociotropic or pocketbook evaluations (Lacy and Christenson, 2017). Anticipating future national economic performance are somewhat easier when the incumbent party is likely to win the election and continue past policies. However when a new opposition party is running, anticipating the national economy poses a significant challenge to voters who cannot acquire and retain the information necessary to compare competing candidate platforms and judge their effect on the economy. Lacy and Christenson (2017) find that the information required to anticipate one's future economic performance will be less burdensome when the incumbent is likely to win the election than when the challenger might win, leading to a change in national economic policies.

Hypothesis 3: The effect of prospective economic evaluations on the incumbent's support are somewhat stronger than the effect of retrospective voting.

2.3 Limits on Economic Voting

Economic voting and its premises have received fair amount of criticism. First, voters tend to be poorly informed, and thus subjective evaluations will be noisy (Bartels, 1996; Hellwig and Marinova, 2015). The level of noise vary with political sophistication of the voters, however, there is no consensus on the direction of the relationship (Alt, Marshall and Lassen, 2016). Low-sophistication voters may be more responsive to media cues to make economic evaluations, and thus, these voters are prone to sociotropic evaluations (Mutz, 1994). On the other hand, the lack of sophistication may make it difficult for voters to assess external information, making pocketbook evaluations more accurate (Carpini and Keeter, 1996). At the same time, the level of noise vary not just with sophistication but

same way from the following future-oriented question: "Now turning to business conditions as a whole—do you think that during the next 12 months we'll have good times financially, or bad times financially?"

also with voters' inclination to "buy" information. Rational ignorance – a concept famously endorsed by Downs (1957) – starts with the assumption that the chance for an individual to deliberately influence the final outcome of any election is close to zero. Thus, investing in better information (on politicians and their policies) has a too high cost and people simply buy little information. A number of seminal models account for poorly informed voters and find that voters selectively expose themselves to particular sources of information (Dal Bó, Dal Bó and Eyster, 2018), they make intertemporal decisions in inconsistent ways (Lizzeri and Yariv, 2017) and fail to extract the right information from other voters' actions (Esponda and Vespa, 2014; Esponda and Pouzo, 2017). Many papers indeed show that voters systematically punish politicians for events, such as floods and natural disasters that are clearly beyond the control of the incumbent. Achen and Bartels (2004) for example, show that Woodrow Wilson lost vote share in coastal New Jersey towns in the 1916 election due to a rash of shark attacks preceding the election. In contrast, Healy and Malhotra (2010) show that voters punish politicians for every tornado caused monetary damage, but this finding is not driven by false attribution of responsibility, but by how voters perceive the failure of the government to react to or prevent such event. In this sense, they argue, that voters could reasonably expect government to be responsible for preparation, mitigation, and response to natural disasters. In line with this hypothesis, voters do not punish politicians for deaths caused by tornadoes and thus they do not simply respond to tornadoes emotionally, but rather they are sophisticated enough to be able to separate out economic and non-economic concerns. Interestingly, the same authors published a paper in the same year that goes somewhat against their own findings. Healy, Malhotra and Mo (2010) demonstrate that a win by the local college football team in the week before election day increases the vote share of the incumbents in Senate, gubernatorial, and presidential elections. They also show that this effect is even larger in districts where football teams have more fan support. Another interesting piece by Ansolabehere, Meredith and Snowberg (2014) develop a theory of economic voters, where voters' information about

macro-economic performance is incomplete. The authors work with the assumption that voters collect their information from people who are similar to themselves. The authors find that individuals from groups that experience more unemployment perceive that the national unemployment rate is higher. This reporting bias is common among ethnic minorities with lower educational attainment, and individuals from states with higher unemployment rates. At the same time, the authors show that perceptions of aggregate economic conditions are more homogeneous among individuals that rely on more information about the national economy. Finally, they find that state unemployment has a negative relation with evaluations of national economic conditions, and presidential support.

Second, there are some concerns over the (in)ability of voters' to retain and use economic information. First, some claims that voters have myopic bias and focus on recent rather than cumulative incumbent performance (Huber, Hill and Lenz, 2012; Kramer, 1971). For instance, Wlezien (2015) provides evidence that voters are basing their judgments only (and equally) on the final two years of a president's term in the United States.[4] Using an experiment, Huber, Hill and Lenz (2012) show that voters overweight recent payments from the allocator and thus make voting decisions even if this decision does not maximise their economic welfare. To understand why voters put so much weight on election year, Healy and Lenz (2014) conduct a series of survey experiments and find that even though it is the best intention of the voters to access the whole presidency, but voters end up replying on election-year income growth because it is a more easily available metric. Second, voters are not able to benchmark. For example, Leigh (2009) offers evidence that voters are not able to distinguish between global economy and their own country's economic performance. As a result, voters tend to reward incumbent due to global macroeconomic swings rather than due to good national economy. Third, voters are prone to biases from rhetoric, framing, and marketing (Lenz, 2013). Fourth, many argue that voters rely on cognitive shortcuts often using heuristics to make voting decisions. Huber, Hill and Lenz (2012) argue that part of

[4]This tendency, however, might reflect some degree of rationality, as it indeed takes some time for economic policy to filter through to economic outcomes (Erikson, 1989).

the explanation for voters' election-year emphasis comes from a pure cognitive bias as they tend to rely on a more easily available attribute and make decision based on availability heuristic. In addition to predictable cognitive biases, emotions may also influence voters. Voters decision may simply reflect voters' emotional reactions to the current state of affairs (Healy and Malhotra, 2013).

No surprise that some economists cast doubt on the sanguine view of economic voting and argue that voters appear to make (economically) substantial, consistent, and correlated errors often holding some entity accountable for actions beyond their control (Cerrato, Ferrara and Ruggieri, 2018). While these discrepancies and limitations of economic voting theories indeed cast doubt on voters' ability to hold their elected representatives accountable (Gomez and Wilson, 2001), and while it is very important to keep these in mind, this dissertation looks at a third issue that is the most salient from empirical perspective: *the issue of endogeneity*. Therefore, Section 2.3.1 is devoted to examine and explain the issue of endogeneity, while Section 2.4 looks at how prominent papers overcome this issue with a special focus on two papers that are directly relevant for this dissertation.

2.3.1 Limitation of the Economic Voting Literature: Endogeneity

Several studies argue that the relationship between perception on national as well as on own economic circumstances and party support is plagued by endogeneity. The key assumption, most of the literature uses is that economic perceptions influence vote choice (Dassonneville and Lewis-Beck, 2019). Accordingly, voters first have a clear party preference and then report an economic evaluation that conforms with that choice (Chzhen, Evans and Pickup, 2014; Pickup and Evans, 2013). In other words, perceptions might be biased by partisanship that leads voters to view the same economic events more favourably if their preferred party is in office (John, 1992).

A branch of literature claims that economic perceptions are an outgrowth of voters partisan dispositions (Anderson, 2007; van der Eijk et al., 2007). In particular, voters first

have a clear party preference and then report an economic evaluation that conforms with that choice (Chzhen, Evans and Pickup, 2014; Pickup and Evans, 2013). In other words, perceptions might be biased by partisanship that leads voters to view the same economic events more favourably if their preferred party is in office (John, 1992). Therefore any effect of the perception variable on party preference is not due to actual economic conditions and rationally updating attitudes, but rather due to partisan bias and partisan filtering (Bisgaard, 2015; Schaffner and Roche, 2016). For instance, Evans and Andersen (2006) estimate the effect of economic perceptions and partisanship on vote share. They find evidence that prior partisanship significantly affects economic perceptions; and thus economic perceptions are not exogenous. Schaffner and Roche (2016) use a natural experiment involving the October 2012 jobs report announcement in the United States and examine the reactions by Republicans and Democrats on a question about the unemployment rate right before and right after the announcement that unemployment had fallen below 8 percent for the first time during the Obama presidency. Their results show that Democrats *versus* Republicans reacted to the news in a systematically different way. While Democrats reveal a uniform updating of information in the direction of greater accuracy, a large share of Republicans perceive unemployment to be even higher than 8 percent after the date of the announcement. In line with this finding, Taber and Lodge (2006) show that when voters process new information, individuals may be influenced not only by their desire to have accurate information but also by having information that are in line with an individual's prior beliefs or attitudes.

Another branch of the literature is rather interpreting voters behaviour within the rational choice framework and argue that while partisanship and partisan filtering are important determinants, still – despite the heavy influence of partisanship – voters have the capability to make accurate assessments. Relying on data from American election between 1968 and 2008, Lewis-Beck, Martini and Kiewiet (2013) show that changes in objective macroeconomic measures such as changes in GDP, CPI, and the S&P 500 explain very well changes in

an individual's perception on the national economy. In a comparative analysis of the 2008 and 2011 Spanish elections, Fraile and Lewis-Beck (2014) argue extensively about the issue of endogeneity and claim that when accounting for possible sources of endogeneity (ideology), economic perceptions have a significant explanatory power in elections.

Hypothesis 3: The effect of perception on own and on the national economic circumstances are plagued by endogeneity concerns.

2.4 The Search for Causal Relationship in the Economic Voting Literature

The theoretical account of economic voting drew heavily on a funnel of causality. In search of causal relationship, majority of papers are concerned with identifying (potentially exogenous) economic shocks that hit one segment of the society and that exacerbate some inequalities through changes in economic opportunities. These arguments typically understand economic voting as a consequence of the local labour-market effects of specific economic shocks such as rising import competition, changes in technology, rise of winner-take-all markets and erosion of labour-market protections. Such changes (and shocks) normally generate widespread dislocation and cause an erosion in voters' trust in the political system. While this approach is powerful and provide convincing evidence on exogeneity, most of these papers actually look at changes in one minor part of the society as compared to another part. The narrow focus of these papers has implication for generalisability.

Another, rather new branch of papers assume that changes in objective measures such as changes in household disposable income indeed affect vote share, but only through the perception of individuals on national and personal economic circumstances. Hence, changes in observable economic measures serve as an ideal tool for estimating exogenous variations in endogenous perception measure and thus for estimating the effect of perception on party preference more precisely and accurately. Nonetheless, there are only a limited number of

papers following this practice as merging survey data to observable changes in economic variables is an extremely rare and very data-hungry process.

We below overview both branches of the literature, nonetheless, more papers exist within the first category, hence the overview is unbalanced.[5]

2.4.1 Literature on Endogeneity: Identifying an External Economic Shocks

Majority of the studies in the field of economics draw at least implicitly from the politically contentious nature of globalisation and trace any changes in party preferences from its strong redistributive implications. In a notable piece, for instance Rodrik (2018) argues that advanced stages of globalisation are prone to populist backlash. While the economic anxiety and distributional struggles exacerbated by globalisation generate a base for populism, the relative salience of available cleavages as well as the narratives provided by populist leaders are what determine political orientation (thus left-wing and right-wing variants of populism). More precisely, for Rodrik (2018) the forms in which globalisation shocks can make an impact on society also determine the content of the populist reaction: right-wing populist mobilise along ethno-national/cultural cleavages as a result of issues such as immigration and refugees; while left-wing populists organise themselves along income/social class lines as a reaction to trade, finance, and foreign investment shocks.Economics-centred literature is very prominent in identifying special forms of globalisation and in estimating its effect on certain segments of the society. In particular, three different types of globalisation shocks challenge local economic circumstance that are (1) trade shocks (2) immigration and (3) financial crisis.

Instead of globalisation in general, economists typically engage in testing the local labour-market effects of trade exposure from foreigners (Hakobyan and McLaren, 2016; Autor et al., 2020). There are several mechanisms at work linking trade shocks to political back-

[5] Sub-section 2.4.1 is an extended and strongly revised version of an article written together by István Benczes (Benczes and Szabó, 2021).

lash: import exposure (1) affects a well-defined minority, typically blue-collar, manufacturing workers who suffered substantial income losses (Autor et al., 2020); (2) induces anxiety about the future (Mughan, Bean and McAllister, 2003); (3) changes the economic circumstances of certain part of the society through lowering consumer prices or through increased targeted government transfers (Dippel et al., 2021); (4a) acts as a shock to local labour markets in case of manufacturers shift production toward more differentiated higher-markup output varieties; or (4b) if it leads to task-upgrading within industries and occupations (Becker and Muendler, 2015). The effect of the concentrated impact of the China shock on specific industries and regions is also in the focus of studies (Tella and Rodrik, 2020). Autor et al. (2020) find that the exposure of local labour markets to increased foreign competition has contributed to rising political polarisation in the policy preferences and media viewing habits of the American public. In contrast, focusing on the United States, Feigenbaum and Hall (2015) find no effect of economic shocks from Chinese import competition on the re-election rates of incumbents and on the probability an incumbent faces a primary challenge, however they demonstrate that localised economic shocks from trade cause a pronounced and consistent shift toward protectionism on trade bills. Incumbents avoid electoral effects of economic shocks because they are able to take popular positions on foreign trade bills in response to these trade-based economic shocks. Testing similar argument but for West European party competition, Colantone and Stanig (2018) analyse the effect of Chinese import on elections in 15 Western European countries. They find that import shocks lead to an increase in support for radical-right, nationalist and isolationist parties and argue that voters respond to the shock in a sociotropic way.

To infer causality, most of these studies use Chinese import penetration as the main form of trade shocks (Ballard-Rosa, Jensen and Scheve, 2021; Barone and Kreuter, 2021; Cerrato, Ferrara and Ruggieri, 2018), while some rely on NAFTA vulnerability, or import versus export trade exposure (Jensen, Quinn and Weymouth, 2017). The dependent variable, however, can be notably diverse: the consumption of polarised media (Autor et al., 2020), the

demand for authoritarian values (Ballard-Rosa, Jensen and Scheve, 2021), vote shares for populist parties (Barone and Kreuter, 2021), and the individual's appreciation for political candidates (Cerrato, Ferrara and Ruggieri, 2018).

Another branch of economics literature tests the effect of the inflow of immigrants on voting behaviour (Steinmayr, 2016; Hangartner et al., 2019; Tomberg, Stegen and Vance, 2021). There are two commonly tested, but contradictory theories: the context theory – hypothesising that migrants and refugees could intensify negative attitudes and thus steer hostility (for example Pettigrew, LeVine and Campbell (1973); Pratto et al. (1994)) – and the contact hypothesis – assuming that people with more immigrants as friends or work colleagues have more positive attitudes towards migrants and refugees.

Those in support for the context hypothesis typically focus on a single country case: Barone et al. (2016) on Italy, Halla, Wagner and Zweimüller (2017) on Austria, Mendez and Cutillas (2013) on Spain, and Otto and Steinhardt (2014) on Germany (Hamburg more precisely). Barone and Kreuter (2021) find that immigration generates a causal increase in votes for the centre-right coalition with anti-immigrant sentiment in Italy, while Halla, Wagner and Zweimüller (2017) provide evidence that immigration increases demand for far right-wing parties in Austria. They both argue that cultural diversity, competition in the labour market and for public services, and concerns for the quality of their neighbourhood are the most relevant channels at work. Similarly, focusing on Hamburg, Otto and Steinhardt (2014) provide empirical evidence that the inflows of immigrants and asylum seekers have a positive effect on the support for xenophobic, extreme right-wing parties and an adverse effect for party that actively campaigned for liberal immigration policies and minority rights. They argue that non-economic determinants and welfare state considerations shape individual attitudes towards immigration. In a similar vein, Dustmann, Vasiljeva and Damm (2018) find that in all but the most urban municipalities, allocation of larger refugee shares between electoral cycles leads to an increase in the vote share for right-leaning parties with an anti-immigration agenda in Denmark. However, they find evidence for a sharp divide

in attitudes to refugees between urban and rural populations. Studying Spain, Mendez and Cutillas (2013) prove that Latin-American immigration increased natives' participation rate and their support for the major leftist party and explain their findings mainly through non-economic factors like dissimilarities between natives and immigrants in language, religion, and race. Similarly, Dinas et al. (2019) find that recent refugee inflows in the Greek islands generate support for restrictive asylum and immigration policies and increased vote shares for the extreme-right party. In a recent paper, Tomberg, Stegen and Vance (2021) test the causal effect of asylum seekers in Germany and find that economic circumstances, as measured by the unemployment rate and the level of disposable income condition voters' responses to the presence of asylum seekers. The effect of asylum seekers on the vote share for the far right remains stable, but weakens for the left, eventually becoming negative as the economic conditions become worse.

In contrast, relatively fewer studies find support for the contact hypothesis. According to the contact hypothesis, the inflow of immigrants might increase the level of empathy and understanding and decrease discriminatory behaviour (Berg, 2009; Finseraas and Kotsadam, 2017), particularly when in-groups and out-groups (1) share equal status and common goals, (2) find themselves in a cooperative rather than competitive environment, and (3) operate under a well-defined set of norms or regulations, contact can reduce prejudices. In support of this hypothesis, Steinmayr (2016) finds that hosting refugees decreases support for the right among a sample of Austrian communities from 2015. Gerdes and Wadensjö (2008) provide evidence that the anti-immigration parties are among those that win votes when the immigrant share increases in Denmark. Dustmann, Vasiljeva and Damm (2018) conversely find evidence for a negative effect of refugees on center-left parties, but one that is again conditional on location; in highly urbanised areas they find the effect to be positive.

Papers on immigration are highly diverse in terms of dependent and independent variable specifications. While some use immigration share (Barone and Kreuter, 2021; Brunner and Kuhn, 2018; Halla, Wagner and Zweimüller, 2017; Edo et al., 2019); migration from

accession countries (Becker, Fetzer and Novy, 2017); change in immigrant stock (Caselli, Fracasso and Traverso, 2020); others use refugee influxes (Dinas et al., 2019); change in refuge allocation; share of population of non-Western origin (Harmon, 2018); asylum seekers (Dustmann, Vasiljeva and Damm, 2018; Tomberg, Stegen and Vance, 2021) as independent variables. Similarly, the dependent variables vary from vote share for Republicans in House, Senate and presidential elections; changes in vote share for major leftists over major conservative parties (Mendez and Cutillas, 2013); vote share for far-right parties (Otto and Steinhardt, 2014) and for far-left parties (Edo et al., 2019).

While globalisation with its different types of shocks (such as a sudden influx of immigrants) have a rather long-term effect on the society that systematically alter social and economic dynamics, another branch of the literature looks at a very particular crisis: the 2008–2009 global financial crisis and the 2010 Europe's sovereign debt crisis. To test the effect of financial crisis, some papers rely on a panel dataset covering many advanced economies over time. Funke, Schularick and Trebesch (2016) examine the effect of the financial crises on vote shares in 20 developed countries over 1870 and 2014 and find that after a financial crisis, the vote share for far-right parties increase (but not far-left parties). Interestingly, regular business-cycle recessions or macro shocks that do not involve financial crisis do not produce similar effects. Bergh and Kärnä (2020) also find that there is a positive relationship between the trade and financial globalisation (measured by the KOF globalisation index) and the vote share for 33 European populist parties. Focusing on 70 countries from 1975 to 2010, Mian, Sufi and Trebbi (2014) find that following a financial crisis (as defined through banking crisis, currency crisis, debt crisis and inflation) voters turn to be more extreme while political fractionalisation increase and ruling collation become weaker.

Similarly, distinguishing between economic winners and losers, Dal Bó et al. (2018) test the effect of economic insecurity generated by the financial crisis and reforms of labour market and welfare state arrangements in 2016 on the rise of the far-right Sweden Democrats. Both the reforms and the financial crisis produced greater inequality in the Swedish society.

The main findings suggest that there is an increasing demand for Sweden Democrats in municipalities with the presence of losers from the reforms and from the financial crisis.

East-Central European countries (especially Poland and Hungary) have also become part of the interest of economists due to these countries' foreign currency debt exposure that might (have) fuel(led) demand for populism. These studies revolve around the creditor-debtor conflict hypothesis and argue that the unequal distribution of the burden of adjustment to adverse economic shocks across creditors and debtors challenge voters' party preferences. For instance, if the debt contracts are non-contingent, debtors (and potential voters) bear the burden entirely even though debtors tend to have the least capacity to absorb losses (Frieden, 2015). This burden might be even heavier if the debt is denominated in foreign currency following a crisis where domestic currency depreciates against the foreign ones. For a populist party, advocating debtor-friendly policies resonate with their claim to stand for "the people" against the establishment in general and against the financial sector in particular. At the same time, populists use their debtor-friendly redistributive policies and anti-creditor rhetoric as a signal that they are not captured by the elite. Gyongyosi and Verner (2021) provide empirical evidence for this narrative and study the rise of the far-right Jobbik party in Hungary after the financial crisis of 2008. By exploiting variation in exposure to foreign currency household loans during a currency crisis in Hungary, the authors find that foreign currency debt exposure leads to a large and persistent increase in the far-right vote share.

Additionally, the debt crises might have resulted in broader social tension. Debtors (and potential voters) borrowed in domestic currency would oppose debt relief bailing out foreign currency debtors as FC debtors took advantage earlier on exchange rate risk and obtained lower interest rates in good times. Those debtors borrowed in domestic currency might indirectly bear the cost of foreign currency debt relief (Ahlquist, Copelovitch and Walter, n.d.). Focusing on Poland, Ahlquist, Copelovitch and Walter (n.d.) find that foreign currency borrowers who are more exposed to the shock of Swiss Franc appreciation were more

likely to demand government action that would make banks pay a larger share of the cost. Among former government voters, Swiss Franc borrowers were more likely to vote for a populist party.

Compared to the previous ones, the scholarly empirical literature on the relationship between financial crises and populism is rather thin. The main dependent variables economists rely on are changes in vote share (Bergh and Kärnä, 2020); demand for government bailouts (Ahlquist, Copelovitch and Walter, n.d.); size of governing coalition (Mian, Sufi and Trebbi, 2014); political fragmentation, fractionalisation and polarisation (Mian, Sufi and Trebbi, 2014). The main independent variables are repayment of mortgages denominated in Swiss francs (Ahlquist, Copelovitch and Walter, n.d.); foreign currency debt exposure (Gyongyosi and Verner, 2021); banking, currency and debt crisis (Mian, Sufi and Trebbi, 2014).

2.4.2 Literature on Endogeneity: Identifying Changes in Observable Measure as Exogenous to Perception Measures

Within this literature, one of the most – if not the most – prominent papers is Healy, Persson and Snowberg (2017)'s research. The aim of their research is threefold, they contribute to the debate on pocketbook versus sociotropic voting; they account for the effects of partisanship on economic views; while they also revisit the question of whether voters are myopic. For the purpose of this dissertation, we overview the paper based on the two main objectives. One of the most valuable contribution of Healy, Persson and Snowberg (2017) is the construction of the unique database. In particular, they link a nationally-representative election survey to a comprehensive personal financial information. The observable economic measure comes from tax return database that includes respondents' household income for a complete four-year term of a government. Healy, Persson and Snowberg (2017, 771) claim that "*merging this data with a detailed national election survey allows us to directly analyze the impact that an individual's financial history has on economic evaluations, vote choice, and political preferences*". This dataset allows them to look at the effect of an individuals' per-

ception on personal economic circumstances on vote choice, and compare it with the effect of sociotropic evaluations.

To capture the exogenous variation in the perception variable, they first estimate variations in the perception on own economic circumstance with changes in the household disposable income along with other exogenous confounders. Then, using this estimated variation in the perception variable, they are able to estimate the true effect of the perception on own economic circumstances on party preferences. In other words, they "*implement a two-staged-least-squares (2SLS) procedure to isolate the relationship between vote choice and the portion of the pocketbook evaluation correlated with actual economic conditions*" (Healy, Persson and Snowberg, 2017, 776). Formally, they estimate the following equations:

$$y_i = \beta_1 X_{1,i} + \beta_2 X_{2,i} + C_i'\gamma + \epsilon_i \tag{1}$$

$$X_{1,i} = Z_i'\alpha + \beta_2 X_{2,i} + C_i'\gamma + \nu_i \tag{2}$$

where equation (1) is the second stage of the two-stage-least-square estimation and equation (2) is the first stage. The variable y_i is a binary variable equals 1 if individual i voted for the incumbent and zero otherwise. Variable $X_{1,i}$ is the endogenous perception on own economic circumstances, while $X_{2,i}$ is the perception on the national economy with the assumption that this variable is exogenous. $C_{i,t}'$ are individual specific covariates such as age, level of education, gender and immigration status. The instruments in equation (2) are changes in disposable income between 2009 and 2010; two dummy variables indicating whether a household experienced 10% largest positive and negative income shocks.

Their main findings suggest that pocketbook considerations are just as important as sociotropic for voters. One of their main findings also echo one contribution of the dissertation, namely that *together, the results show that our understanding of economic voting depends*

crucially on the quality of available data(Healy, Persson and Snowberg, 2017, 772).

There are two *main limitations* of this piece. First and foremost, the authors assume that perception on national economy is not endogenous, thus this variable is used to estimate the "exogenous" variation in the perception on own income variable in equation (2). Nonetheless, voters have a clear party preference and then report an economic evaluation that conforms with that choice too when looking at macroeconomic measures at national level. Second, given that this paper only looks at the 2010 election, the dataset does not have a time dimension, therefore the authors are not able to include a time fixed effect. Especially in Sweden, the financial crisis might have had a special effect on voters perception on the national economy, that could have been captured by year fixed effect.

Another very influential paper is by Simonovits, Kates and Szeitl (2019) who study the effect of local economic conditions on the Hungarian national elections in 2006, in 2010 and in 2014. The paper exploits data on local economic conditions by relying on settlement-level administrative unemployment data. In order to explore the political consequences of local unemployment, they merge this data with national election returns at settlement level. Finally, the authors also use the same dataset – but for shorter period – the dissertation relies on and match the settlement level data with the survey dataset measuring the vote intentions of nearly 100,000 individuals. The main independent variable is the unemployment rate using data of number of unemployed people registered in each settlement in Hungary, while the main dependent variable is the election returns on settlement-level. The authors estimate the following regression:

$$y_{i,t} = \beta_1 X_{i,t-4} + \beta_2 \Delta C_{i,t} + u_i \tag{3}$$

where $y_{i,t}$ is the vote share of the incumbent party at the level of settlements, $X_{i,t-4}$ is the incumbent vote share at settlement i in the last national election, and $C_{i,t}$ is changes in unemployment rate

Using the repeated cross sectional survey data, the authors estimate the following equation at individual level:

$$y_{i,t} = \alpha_1 \Delta C_{i,t} + \alpha_2 X_i + I'_{i,t}\gamma + w_i \tag{4}$$

where $y_{i,t}$ is the party preference of an individual i at year t, X_t is the mean of incumbent vote share at settlement i, $I'_{i,t}$ are four binary variables for being retired, student, employed or unemployed.

They provide empirical evidence that local economic conditions have a strong effect on incumbent vote share and that higher unemployment rate comes with a higher likelihood of punishing the incumbent party. The effect of the local circumstances are large not only during the Global Recession when economic concerns were at their height, but also in the next national election.

Essentially, Simonovits, Kates and Szeitl (2019) in equation (4) estimates the effect of an objective measure on party preference *without* including the perception on economy variable. If we accept Healy, Persson and Snowberg (2017)'s argument that changes in objective economic measures affect party preferences only through individuals' perception on the economy, then the estimation in Simonovits, Kates and Szeitl (2019)'s paper is a reduced form estimation where the coefficient on unemployment is only significant because it captures the exogenous variations in the perception variable.

While this paper is very convincing too, there are some *limitations* of the paper. The authors only account for a single local economic measure, for unemployment rate and leaves out other – potentially important measures – such as settlement level income measure. Also, while at the individual level analysis, the authors include individual level control variables on their work status, they do not control for other possible confounder such as for gender, educational level or for religion.

3 The Hungarian Context

3.1 Political Landscape in Hungary

Our research covers the period of 2006 and 2018 that allows us to test economic voting hypotheses for the incumbencies of two opposing party groups (from 2006); for the formation of a new government (from 2010); for the re-election of the reigning party (from 2014); as well as with and without the presence of a strong radical right party emphasising socio-cultural concerns over the economic aspects.

The national parliamentary election consists of a majoritarian part, where voters vote for candidates, and a proportional part that requires voters to cast vote on party lists. The majoritarian component of the election system allows supporters of smaller parties to cast their votes strategically for candidates of larger parties; however concerns on strategic voting are mitigated in party list voting, thus we focus on votes cast on party lists.

In Table 1, we summarise the coalition and alliances of political parties as well as their political orientation for the years of the Hungarian parliamentary elections. In 2006, to oppose Alliance of Young Democrats (Fidesz) and to remain in power, the Hungarian Socialist Party (MSZP) allied with the liberal Alliance of Free Democrats (SZDSZ). In 2010, Fidesz capitalised on a failing economy and together with the Christian Democratic People's Party (KDNP), they won enough seats to achieve a two-thirds majority in the National Assembly.[6][7] In 2014 and in 2018, Fidesz again acquired a super-majority (two-thirds of the seats in the National Assembly).

After the 2010 election, the party system was characterised as tripartite (Kovarek and Soós, 2016). The major block, of course, is formed by the right-wing and conservative Fidesz-

[6] In this study, Fidesz always refers to the Fidesz–KDNP colation.

[7] Fidesz's landslide victory was widely seen as an act of protest voting, against the ruling Hungarian Socialist Party that was in power since 2002. Supporters turned away from the Socialist Party especially after a 2006 leaked tape recording in which Prime Minister, Gyurcsány says his government lied to win April's election and "lied in the morning; lied in the evening" during office.

KDNP party; the leftist block is also relevant, although highly fragmented, with several left-wing and liberal parties. Among them, the two major parties are the Hungarian Socialist Party (MSZP), the successor to the communist state party; and the Democratic Coalition (DK), an MSZP splinter party, led by a former Prime Minister (Kovarek and Soós, 2016). Finally, the radical and far-right Movement for a Better Hungary (Jobbik) party roughly forms the third block.

	2006	2010	2014	2018	Political Orientation
Fidesz-KDNP	x	x	x	x	Right
SZDSZ	x	–	–	–	Former liberal party, formed a coalition government with MSZP between 2006-2008
DK	Alliance under the name of MSZP (split later)	Alliance under the name of MSZP (split later)	Ran together	x	Left
MSZP				Ran together	
PM	–	– (was part of LMP)			
Együtt	–	–		x	
MLP	–	–		–	
Jobbik	– (was part of MIÉP)	x	x	x	Radical right
LMP	–	x	x	x	Green
Momentum	–	–	–	x	Centrist, liberal
Munkáspárt	x	x	x	x	Communist
MIÉP	x	x	–	x	Radical right
MKKP	–	–	–	x	Pirate party, since 2015
MDF	x	x	–	–	Centre Right, former Fidesz ally
Centrum Párt	x	–	–	–	Centrist party
8 small parties of 2006	x	–	–	–	Small parties
3 small parties of 2010	–	x	–	–	
12 small parties of 2014	–	–	x	–	
13 small parties of 2018	–	–	–	x	
Mi Hazánk	–	–	–	–	New radical right

Figure 1: Political Parties in Hungary between 2006 and 2018

3.2 General Economic Landscape

Before the year of 2006, Hungary enjoyed a fast economic growth with an annual GDP growth rate of 4-5%. However, this was partially supported by large budget deficits (the annual deficit figures were larger than 5% of GDP) and current account deficits, that quickly became unsustainable. In 2006, the newly elected socialist government – in an attempt to stabilise state finances – announced an austerity package, which cut back government

expenditures and also contained significant tax increases. As a result of this package, the real GDP growth felt to around 0 in 2007 (see Figure 2).

By autumn, 2008, economy recovered slightly from its state in 2007, when the financial crisis hit the country. The effect of the crisis was severe: it lead to a dramatic decline in economic activity while the international financial markets also stopped financing the Hungarian government debt in October 2008. Hungary was among the first countries that had to rely on an IMF (International Monetary Fund) package. The conditions of this IMF loan included further cuts in social expenditures (e.g. pensions) and structural reforms were also required that together ended up in a nearly 7% drop in the GDP by 2009 (as in Figure 2). At the same time, the government debt increased steadily and reached 80% of GDP by 2010.

In April, 2010, Hungary's conservative opposition party, Fidesz, has secured a convincing victory in parliamentary elections, ousting the Socialists. Following the change in government, a slow economic recovery has started. Although the GDP growth rate remained moderate (and was even negative in 2012), the state finances have been stabilised: the budget deficit remained below 3% of GDP, and the government debt also started to decline slowly (see Figure 2). As a result of this gradual stabilisation, the GDP growth turned into positive in 2013, and Hungary converged towards the EU average.

An important aspect in the Hungarian stabilisation process was a steep increase in the activity rate.[8] Figure 3 shows that in 2008, Hungary had one of the lowest activity rates (around 61%) in the EU. It had especially low activity rates among those who are close to the statutory retirement age, among women at child-bearing age, and also among the unskilled workers. By implementing labour market (and related) policies that targeted this segment of the society – increasing the statutory retirement age and close early retirement

[8]The activity rate is the percentage of economically active population aged 15-64 on the total population of the same age. According to the definitions of the International Labour Organisation (ILO), people are classified as employed, unemployed and outside the labour force. The economically active population (also called labour force) is the sum of employed and unemployed persons. Persons outside the labour force are those who, during the reference week, were neither employed nor unemployed.

channels, supporting part time work of young mothers, and designing a widespread public work scheme for the unskilled – the activity rate in Hungary started to rise sharply, and by 2019 it reached the EU average of 73% (see Figure 3). This development provided a regular means of living for many people – especially in the countryside – who were heavily dependent on state transfers or subsidies.

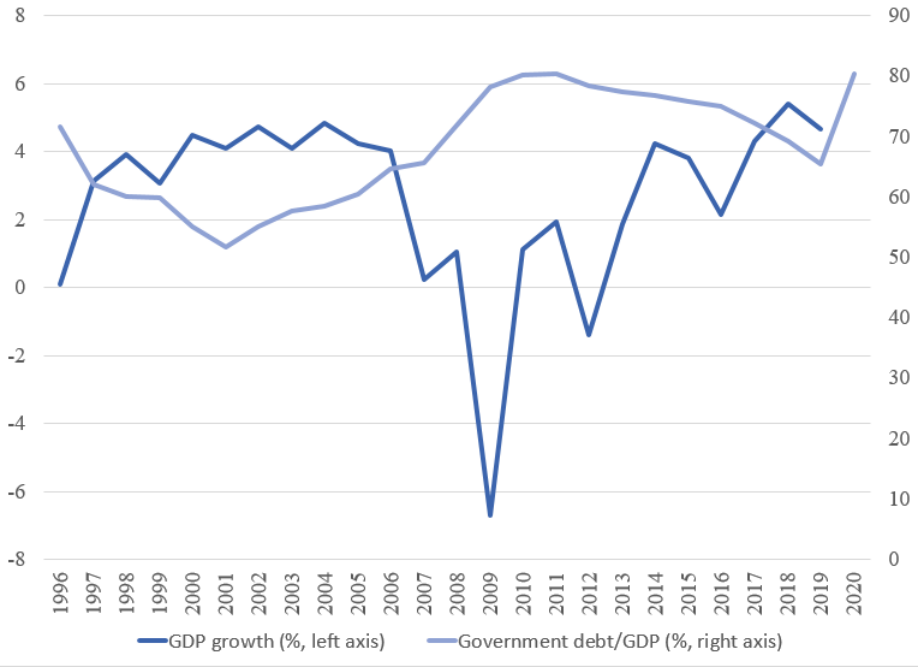

Figure 2: GDP Growth Rate and the Government debt-to-GDP ratio in Hungary between 1996 and 2020

Besides the direct labour market interventions mentioned in the previous paragraph, from 2010 the newly elected right-wing government also implemented a major tax reform. This tax reform had three main elements: decreasing labour market taxes, increasing consumption taxes, and newly introduced sectoral taxes. Regarding labour market taxes, the government gradually decreased the personal income tax rate and social security contribution rates. While the personal income tax rate in 2009 was 18% up to around 80% (1.9 million HUF) of the average wage (2.4 million HUF per year), and 36% above that, the new government gradually introduced a flat personal income tax regime with a flat rate of 16% in 2013-2015 and 15% from 2016. In parallel with this, the employee's social security contribution rate only slightly increased from 17% in 2009 to 18.5% from 2012. The employer's

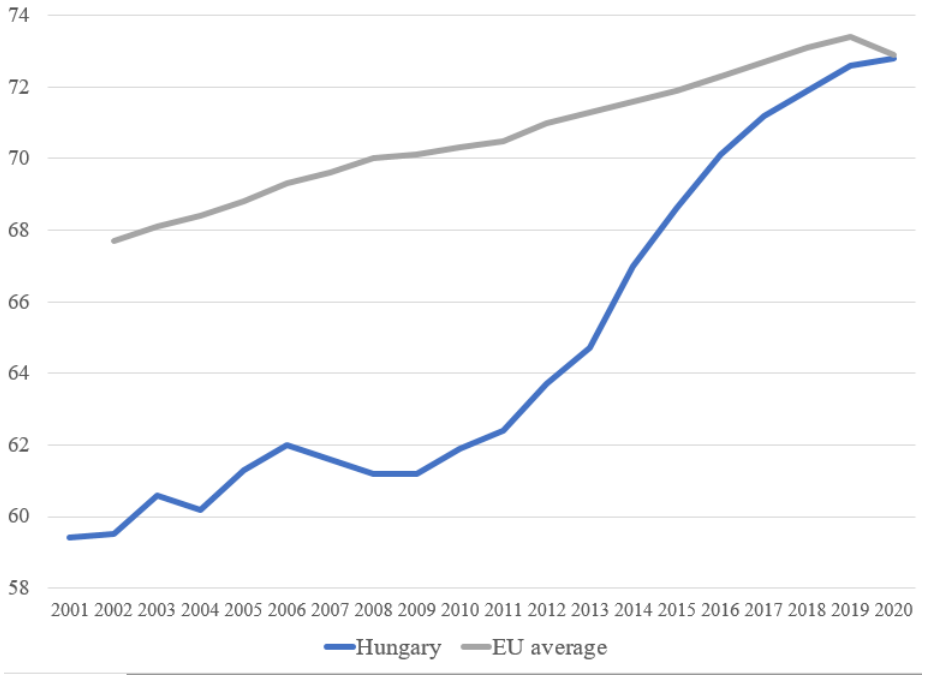

Figure 3: Activity Rate in Hungary between 2000 and 2020

social security contribution rate, however, also decreased significantly: while it was 27% until 2016, in gradually decreased to 15.5% by the second half of 2020.

These labour market policies – the combination of gradually decreasing personal income taxes and contribution rates – fuelled the significant real wage increases of 2010-s; real wages could increase without significant wage cost increases of the firms (see Figure 4). Real wage increases were especially large in the second half of 2010-s, when besides this tax policy, Hungary experienced a steady GDP growth and low inflation. For example, the net real wage indices of the 5-year period of 2016-2020 were 7.4%, 10.3%, 8.3%, 7.3% and 6.2%, respectively, which represents an incredibly large 47% net real wage increase within 5 years (see Figure 4).

In order to make up for decreasing labour-related tax revenues, in this period the government increased consumption taxes. From 2012, the value added tax rate stands at 27% (compared to the 20% general rate in 2009), which is the largest VAT rate within the European Union. The government also introduced sectoral taxes in many sectors that were perceived highly profitable and had significant foreign ownership (e.g. banks, telecommu-

nication companies and utilities).

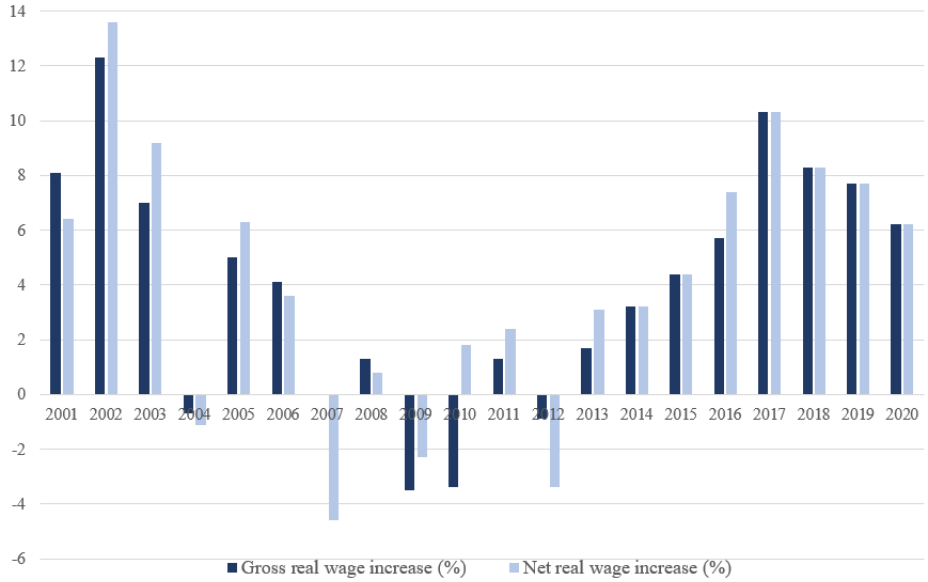

Figure 4: Real wages changes in Hungary between 2000 and 2020

4 Data and Descriptive Statistics

For our empirical analysis data are drawn from TARKI Omnibusz surveys.[9] The survey is designed at the individual level and provides information on the demographic characteristics, income level, the economic perceptions and vote intention of the survey respondents. TARKI applies random selection sampling, and prepares surveys that are representative of the Hungarian adult population.[10] In our sample, there are 107 public opinion survey waves with 108 442 face-to-face individual level interviews.[11] The surveys were conducted

[9] TARKI is a major Hungarian polling firm.

[10] Probability samples are used. For each survey, a stratified random sample of Hungarian settlements is drawn. Settlements with more than 78,000 inhabitants are automatically selected, and the randomisation process is only applied to smaller settlements. Considering the actual size of adult population in a chosen settlement, a target number of interviews is calculated for each settlement and then survey respondents are selected in the sampled settlements using the method of random walk. The final sample is weighed so that the sample becomes representative for the Hungarian adult population in four dimensions: gender, age group, settlement type and education of the respondent. This procedure ensures that the final sample matches the proportions of all population cells in these four dimensions in the census.

[11] The typical survey frequency is monthly, but certain months are missing: out of 145 months in our observation period, a survey was conducted in only 107 months. In the period of 2006-2014, we have 10-11 surveys per year (the missing month is typically August, as TÁRKI did not even try to reach people in the middle of the holiday season). From 2015, the survey frequency changed to quarterly, and therefore we only have 4 survey waves per year.

between January 2006 and January 2018. Tables A1, A2 and A4 show the year, months of the surveys as well as the number of respondents, the share of respondents with a party preference and female respondents by waves.

4.1 Party Preference

Important for the purpose of this study is the availability of party preference data. All surveys in our database include questions on vote intention. On average, there are more than 1000 individuals in each survey of that 60% have party preference.[12] This proportion is slightly below the average turnover in Hungarian parliamentary elections (62-70% in the period of the research). Party preferences are measured based on the survey responses to the question of *"If the general elections were held tomorrow, which party's list would you vote for?"*. Tables A5, A6 and A8 provide descriptive statistics for the vote share variables by survey wave. Columns 3 show the vote share for Fidesz, while columns 4 provide information on the vote share for the opposition. During 2006–2010, MSZP–SZDSZ formed the ruling party (Columns 4); while Fidesz became the incumbent party in 2010 (Columns 3) (see Section 3.1).[13]

4.2 Data on Pocketbook Voting

Individual's Income

There are two income variables at individual level: 1) self-declared net monthly income; 2) self-declared net monthly income category.[14] In the first case, respondents provide a specific amount (in HUF) as their net monthly income; while in the second case they merely situate their income in one of nine net income categories that are provided by the survey. We placed observations with a self-declared income data into an income categories as more

[12] See A1, A2 and A4 for the share of respondent with party preferences by each survey wave.
[13] DK used to be part of MSZP, hence the explanation in Figure 1.
[14] The question we use here is the following: *How much is your total monthly income after taxation?*

data are available on income categories.[15][16] 90,172 observations are grouped in one of the nine income categories. Appendix C details the range of the income categories as well as the population-weighted averages of each income category.[17] Tables A9, A10 and A11 present descriptive statistics for individual net monthly income data by survey waves, with a mean of HUF 92,929 and a standard deviation of HUF 58,933.

Table 1 shows the population-weighted mean of the incumbent parties (MSZP–SZDSZ up until 2010 and Fidesz from 2010) vote share within each income category at individual level. Table 1 provides descriptive evidence on a positive relationship between income and support for the incumbent party, thus, the economic voting hypothesis seemingly works.

Household's Income

Similarly, there are two different income variables at household level: 1) households with self-declared net monthly income; 2) self-declared net monthly income category.[18][19] In the first case, respondents provide a specific amount (in HUF) as their household's net monthly income; while in the second case they merely situate their household income in one of nine net income categories that are provided by the survey. 87,144 observations are grouped in one of the nine household-level income categories. Appendix C details the range of the income categories as well as the population-weighted mean income within each household income categories.[20]

[15] Appendix C.3, Figures A1 and A2 show the share of available data for both income variables at individual level for the January waves only, while Table A15 presents the proportion of respondents with available data.

[16] We could have estimated a specific net income for each data point, nonetheless that would have came with unnecessarily strong assumptions on the distributions of income within income categories of the Hungarian population.

[17] To present descriptive statistics of the income variable at individual level, first the self-declared, net monthly income were taken; second, for observations with missing values, we used the population-weighted mean of each income category. Finally, we treated all zeros in the income variable as missing values as zero does not necessary imply that a survey respondent does not have an income (based on the date of birth of the respondents).

[18] The question we use here is the following: *How much is the total monthly income of your household after taxation?*

[19] Appendix C.3, Figures A1 and A2 show the share of available data for both income variables at household level for the January waves only, while Table A15 presents the proportion of respondents with available data.

[20] To present descriptive statistics of the income variable at household level, we similarly used the self-declared,

Table 1: Descriptive Statistics – Incumbent Vote Share within Income Categories at Individual Level

	2006 MSZP – SZDSZ Vote Share Mean	2008 MSZP – SZDSZ Vote Share Mean	2010 Fidesz Vote Share Mean
20,000 HUF or less	0.21079	0.1251	0.4615
21,000 HUF – 40,000 HUF	0.26211	0.1216	0.4995
41,000 – 70,000 HUF	0.32085	0.1591	0.4209
71,000 – 100,000 HUF	0.34037	0.1853	0.4171
101,000 – 150,000HUF	0.36089	0.2280	0.4124
151,000 – 200,000 HUF	0.34028	0.2261	0.4372
201,000 – 300,000 HUF	0.39917	0.2287	0.3369
301,000 – 500,000 HUF	0.38865	0.3755	0.5315
	2012 Fidesz Vote Share Mean	2014 Fidesz Vote Share Mean	2016 Fidesz Vote Share Mean
20,000 HUF or less	0,1527	0,2712025	0,2870518
21,000 HUF – 40,000 HUF	0,1771	0,3428005	0,2509053
41,000 – 70,000 HUF	0,1925	0,3462428	0,2531506
71,000 – 100,000 HUF	0,1970	0,344465	0,2773655
101,000 – 150,000HUF	0,2292	0,3544281	0,3392898
151,000 – 200,000 HUF	0,2291	0,3476831	0,3355786
201,000 – 300,000 HUF	0,2737	0,3360728	0,4056188
301,000 – 500,000 HUF	0,1986	0,4682314	0,367541

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. The income category of *500,000 HUF or more* is not presented in the Table due to the low number of survey respondent.

Tables A12, A13 and A14 present descriptive statistics for household-level net monthly income data by survey waves, with a mean of HUF 177,248 and a standard deviation of HUF 237,755. 23.31% of the survey respondents live alone in a household, 31.98% of them live together with two members and 44.71 % of them live in a household of three or more. For survey respondents living by themselves, the household income variables are equal to their own income category.[21]

net monthly income variables as well as the population-weighted mean of each income category.

[21] A technical issue with this, is that household income categories are not exactly the same as individual income categories. For instance, it is not straightforward which household income category an individual falls to if an individual is in the income category of 70,000 –100,000 HUF (this individual might be converted into a household income category of 60,000–90,000 or into a category range of 90,000–120,000). To overcome

Table 2 shows how vote share for the incumbent party differs within household income categories and provide some descriptive evidence for pocket voting considerations.

Table 2: Descriptive Statistics – Incumbent Vote Share within Income Categories at Household Level

	2006 MSZP – SZDSZ Vote Share Mean	2008 MSZP – SZDSZ Vote Share Mean	2010 Fidesz Vote Share Mean
60,000 HUF or less	0.2958	0.1369464	0.3971
61,000–90,000 HUF	0.3270	0.2054705	0.3947
91,000–120,000 HUF	0.3042	0.1699027	0.4298
121,000–150,000 HUF	0.3135	0.1530889	0.4554
151,000–200,000 HUF	0.3252	0.1689822	0.4374
201,000–300,000 HUF	0.3544	0.2078962	0.4354
301,000–500,000 HUF	0.3501	0.2244026	0.3973
501,000–1,000,000 HUF	0.4021	0.2000599	0.4147
	2012 Fidesz Vote Share Mean	2014 Fidesz Vote Share Mean	2016 Fidesz Vote Share Mean
60,000 HUF or less	0.1598	0.3376	0.2246
61,000–90,000 HUF	0.1828	0.3437	0.2665
91,000–120,000 HUF	0.1894	0.3621	0.2742
121,000–150,000 HUF	0.1940	0.3668	0.3176
151,000–200,000 HUF	0.2014	0.3115	0.3276
201,000–300,000 HUF	0.2355	0.3404	0.2980
301,000–500,000 HUF	0.2406	0.3893	0.3843
501,000–1,000,000 HUF	0.3497	0.4168	0.4036

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. The income category of *1,000,000 HUF or more* is not presented in the Table due to the low number of survey respondent.

Figure 5 shows the average net monthly income of individuals and households and reveals how wage inflation is reflected in the data. Figure 5 largely reflects macro developments in Hungary such as the effect of the 2008 financial financial crisis (seen especially in the individual income series); the 2011 income tax reallocation that decreased the net wage of earners around the minimum wage; while the second half of 2010's shows a sudden increase in net wages.

this issue, we rely on probabilistic assignment of individuals into household income categories.

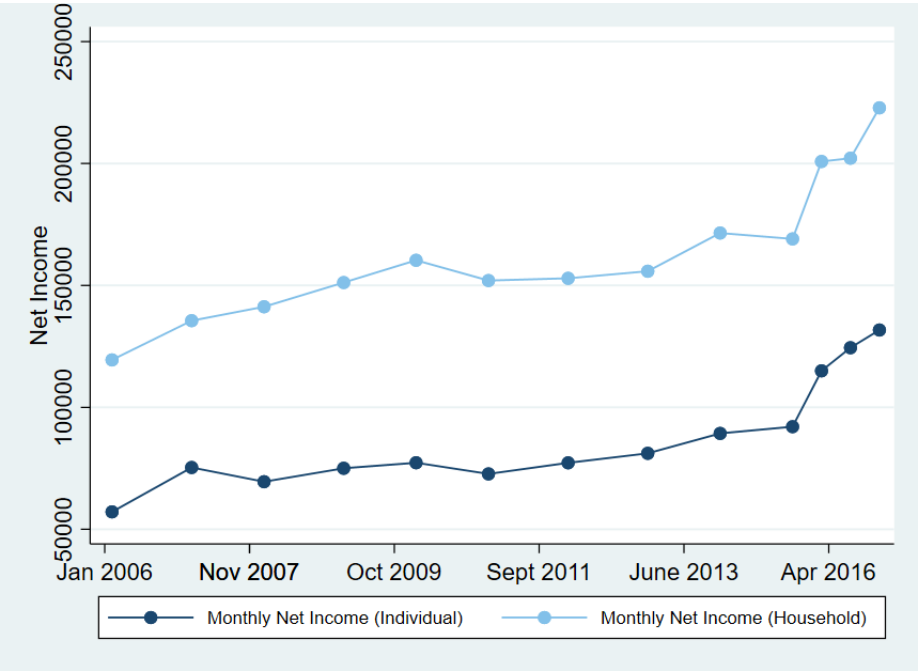

Figure 5: Monthly Average Net Income or Household Income of Survey Respondent with a Self-Declared, Non-zero Income

Individual's Assessment of their Own Circumstances

The voting behaviour literature is nearly unanimous in their belief that economic voting is derived from changes in wealth relative to some reference point, rather than levels of wealth, as is usually assumed in theories based on expected utility (Thaler, 2016). The *value function* which translates perceived changes in wealth into policy preference weights losses more heavily than gains, thus decreasing tendencies in wealth have stronger effect on policy preferences.

While we can situate a survey respondent's net monthly income relative to the median or mean income of the other respondents or even to some reference point in the survey respondents' settlement, nonetheless, it does not account for changes in survey respondents' perception on these differences nor for changes relative to their own past circumstances. To account for changes relative to a respondent's past self and to look behind the face value of net monthly income, we measure individuals perception on their own economic circumstances and use survey responses to the following question: *"How do you assess your*

own financial situation at the moment?". This is a categorical variable that varies from 1 to 5, where the value of 1 stands for a "very bad" and the value of 5 for a "very good" category.[22] [23] Table A17 in Appendix D shows the descriptive statistics for the individual's assessment variable. There are 39,177 survey respondents with a population-weighted mean of 2.63 (survey respondents, on average, are somewhere in between the "very bad" and "neither bad nor good" categories) and with a standard deviation of 0.83.

Figure 6 shows the correlation between vote share for Fidesz and individuals' view on their own financial situation. Vote share on Fidesz – being the opposition before April 2010 and the incumbent ever since – perfectly follows the moderate V shape of the assessment variable: voters views on their own financial situation was rather inauspicious before the 2010 election, thus, they punished the incumbent party (the Hungarian Socialist Party (MSZP) and the liberal Alliance of Free Democrats (SZDSZ)) and turned to the opposition party, to Fidesz. Before April 2010 election, the correlation between the assessment variable and Fidesz vote share is -0.076 (significant at 1% level), implying that more negative views on individuals' own financial situation pushed voters away from the incumbent party and pulled them closer to the opposition. This correlation turns to be positive with a value of 0.23 and statistically significant at 1% level after the election, thus in the Fidesz-era respondents who evaluate their own economic conditions as getting better vote for – and rewarding – the governing party.

4.3 Data on Sociotropic Voting

Individuals Assessment on the Performance of the National Economy

While the level of unemployment, a country's GDP or any other macroeconomic measures

[22] More precisely, the value of 5 stands for a category of "very good"; 4 is "good"; 3 is "neither good nor bad" category; 2 is for the "bad" label and the value of 1 goes to the "very bad" category.

[23] This variable is not available in each survey wave: between 2006 and 2013, this question were asked approximately 4 times in a year in January, April, July and October; between 2014 and 2015, there were annually 2 waves with this question, while in 2016, all wave included this variable. We have data in 39 waves.

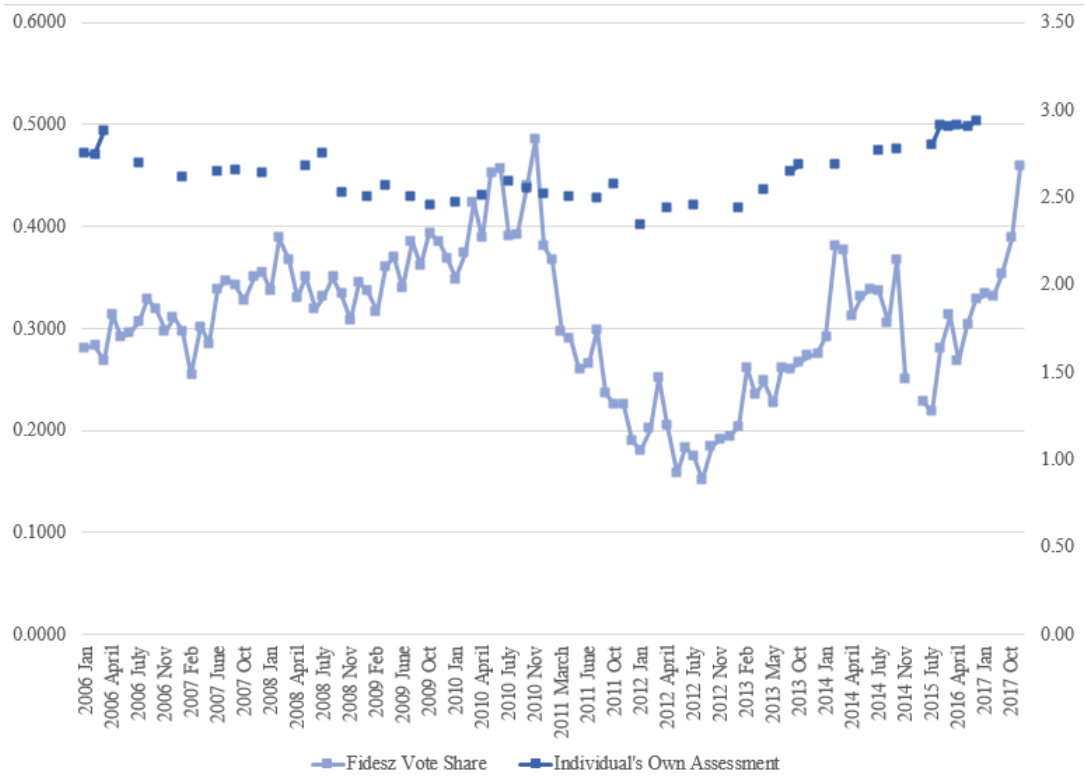

Figure 6: Changes in Fidesz Vote Share and in Individual's Own Assessment between 2006 and 2017

might be informative on sociotropic voting, individual's perception and their relative view on the national economy detects more precisely the tendencies of sociotropic voting for two main reasons. First, economic policies are often subject to the problem of time-inconsistency that undermines the pursuit of policies that are desirable for the long term. Bad economics, therefore, can be popular, if only temporarily(Dal Bó, Dal Bó and Eyster, 2018). Second, a voluminous literature claims that voters demand bad policy because voters incorrectly rank policies merely in welfare terms and systematically underappreciate the extent to which policy changes will affect the behaviour of other people (Dal Bó et al., 2018), or voters fail to understand the economic effect of certain policies (Sausgruber and Tyran, 2005). Thus, data on individuals' own assessment on the national economy party rather than macroeconomic variables show a more nuanced picture on respondents' systematically biased beliefs on how public policies work and on the potential long-term effect of macroeconomic policies on economic outcomes.

To measure individuals' perception on the national economy, we use survey responses to the following question: *"How do you assess the country's economic situation at the moment?"*. Individuals' assessment on the national economy has five categories and differentiates between "very good" (with a value of 5) and "very bad" (with a value of 1).[24] Table A19 in Appendix E shows the descriptive statistics for the individual's assessment variable. There are 42,549 survey respondents with a population weighted mean of 2.29 and with a standard deviation of 0.81.

Figure 7 shows changes in Fidesz vote share and in individual's assessment on their own financial situation and on the national economy between 2006 and 2017. The two perception variables are converging especially during the second Fidesz government after 2014. The correlation between Fidesz vote share and views on national economy resonates with the sociotropic hypothesis: before April, 2010 election, the correlation was -0.17 implying the punishment mechanisms; after April 2010, the correlation is 0.35 that supports the reward hypothesis. The positive correlation between Fidesz supporters and views on national economy was especially large within a year before the April 2014 election with a value of 0.42.[25]

4.4 Data on Retrospective Voting

Individuals Assessment on Whether the General Situation Follows a Generally Good or Bad Direction

To test retrospective voting hypothesis – the study of how citizens evaluate and act on their perceptions of government performance – we use the question of "*What do you think, is the general situation getting better or worse in Hungary?*".[26] Individuals' assessment on the general directions of the economy has ten categories and differentiates between "very good"

[24] This variable is available in 44 waves; the question was asked approximately 4 times in a year in January, April, July and October over 2006–2013; 7 waves included this information in 2014 and 2 in 2015, while in 2016, all wave provided information on this variable.

[25] The correlations were significant at 1% level.

[26] This variable is available in 63 waves from November, 2009.

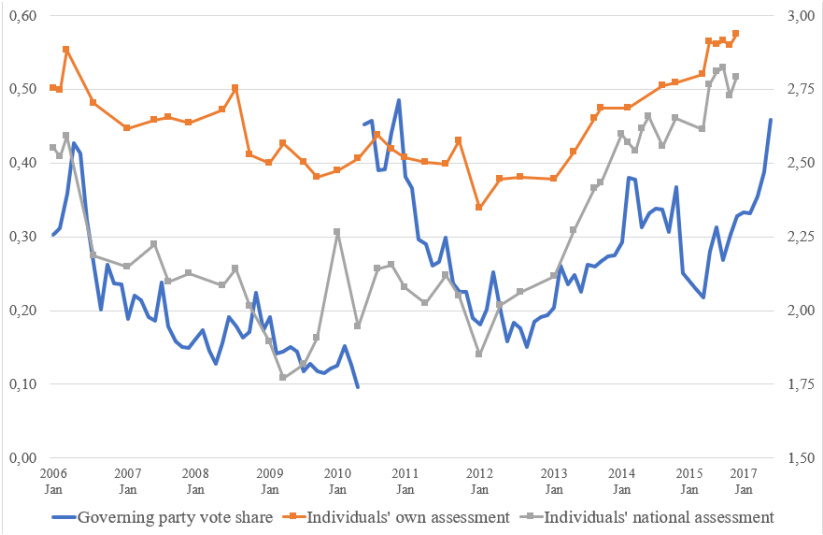

Figure 7: Changes in Fidesz Vote Share and in Individual's Assessment on their Own Financial Situation and on the National Economy between 2006 and 2017

(with a value of 5) and "very bad" (with a value of -5).[27] Table A20 and A21 in Appendix F show the descriptive statistics for the 62,457 survey respondents with a mean evaluation of 2.55 (around halfway between neither good nor bad and slightly bad) with a standard deviation of 1.00.

Figure 8 depicts the evolution of this variable over time, together with Fidesz vote share variable. Before the April 2010 election, the mean assessment of the general situation was very bad (somewhere between -2.5 and -3), and it was deteriorating. In this period the correlation with the Fidesz vote share is -0.2 (significant at the 1% level). After the 2010 election, however, respondents' view on the general situation improved dramatically (to a level of 0, approximately), and this assessment and their support for the reigning Fidesz party move together, with a strong correlation of 0.5.

4.5 Data on Prospective Voting

Several theories of voting behaviour suggest that voters evaluate candidates in an election based on the candidates' past performance as well as future promise. There is a dispute in

[27] The data were rescaled from a minus 5, plus 5 range to a 0 and 5 range.

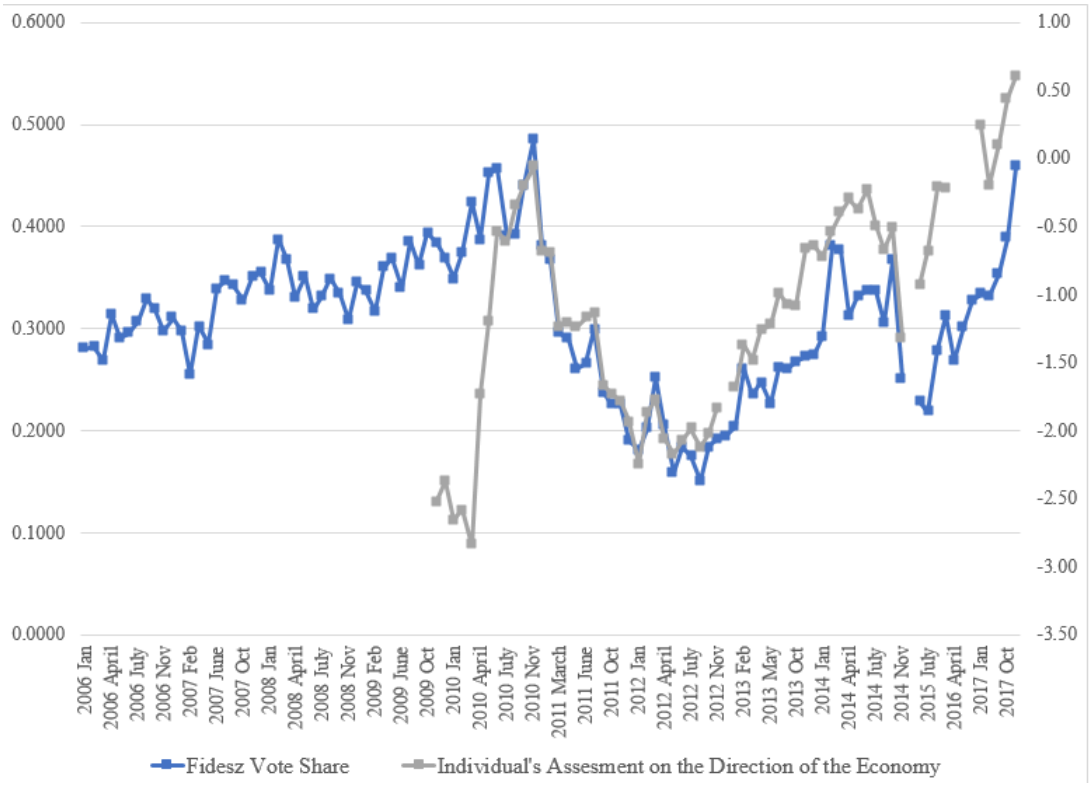

Figure 8: Changes in Fidesz Vote Share and in Individual's Assessment on Whether the Economy Follows a Generally Good or Bad Direction between 2009 and 2018

the literature on which direction voters look when choosing candidates: do voters weigh past performance or future promise more heavily in the voting booth. To test tendencies in prospective voting, we rely on two sources of information: individual's 12-month income expectations and individual's 12-month expectations for the national economy.

Individual's 12-month Financial Expectations

First, the question of "*What is your own financial expectation for the next year?*" is used to capture prospective voting.[28] Individuals' expectations has five categories and differentiates between "much better than today" (with a value of 5) and "much worse" (with a value of 1). Table A22 and A24 in Appendix G show the descriptive statistics for 77,461 respondents, with a mean of 2.76 and a standard deviation of 0.86.

Individual's 12-month Expectations for the National Economy

[28]This variable is available in 81 waves.

Second, we rely on the question of "*What is your expectation for the national economy for the next year?*".[29] Individuals' expectations for the national economy has five categories and differentiates between "much better than today" (with a value of 5) and "much worse" (with a value of 1). Table A25 and A27 in Appendix H show the descriptive statistics for 76,920 respondents, with a mean of 2.76 and a standard deviation of 0.92.

Figure 9 presents the time series of individual's 12-month own financial expectations, together with their expectations for the national economy between 2006 and 2018 and shows the voters are not able (or not willing) to distinguish between expectations for their own economic situation and for the national economy. Figure 10 provides descriptive evidence that changes in Fidesz vote share are perfectly in line with the prospective voting hypothesis. Before the April 2010 election, voters' prospects on their own financial situation as well as on the national economy as a whole were decreasing, thus, to "punish" the current government, voters turned to Fidesz that was in opposition at the time: the correlation between the vote share of Fidesz and between the two variables were -0.04 and -0.08 respectively (significant at 1% level). After the 2010 election, respondents' expectations on their own financial situation and on the national economy have a positive correlation with the vote share of Fidesz (with 0.30 and 0.39 correlation coefficients respectively).

[29] This variable is available in 81 waves.

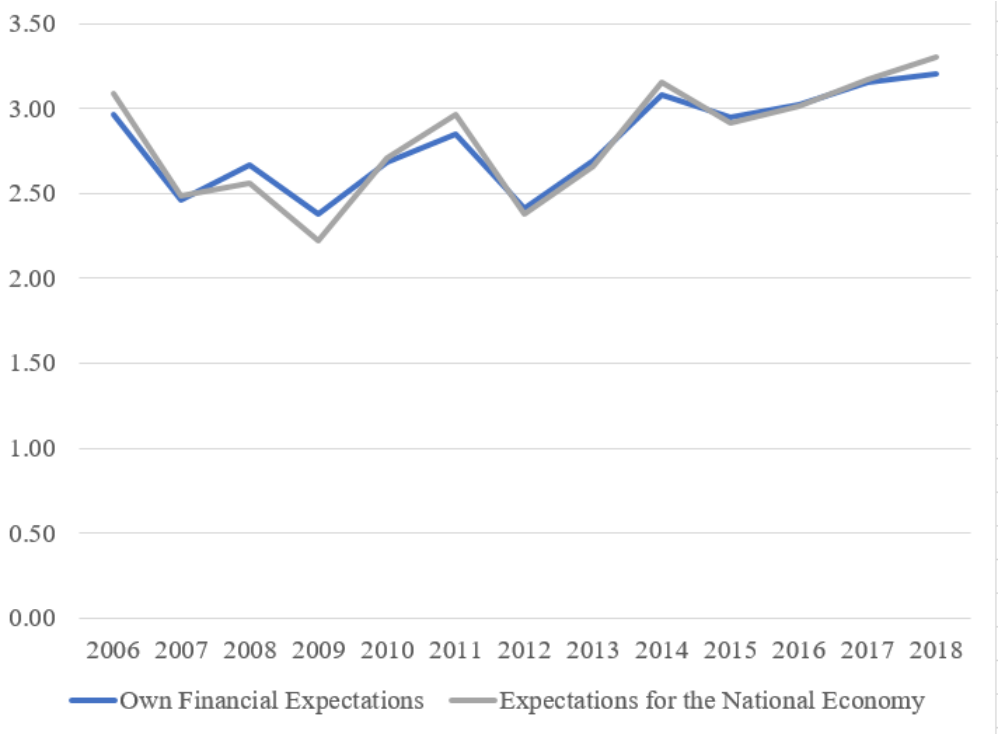

Figure 9: Changes in Individual's 12-month Own Financial Expectations and in Expectations for the National Economy between 2006 and 2018

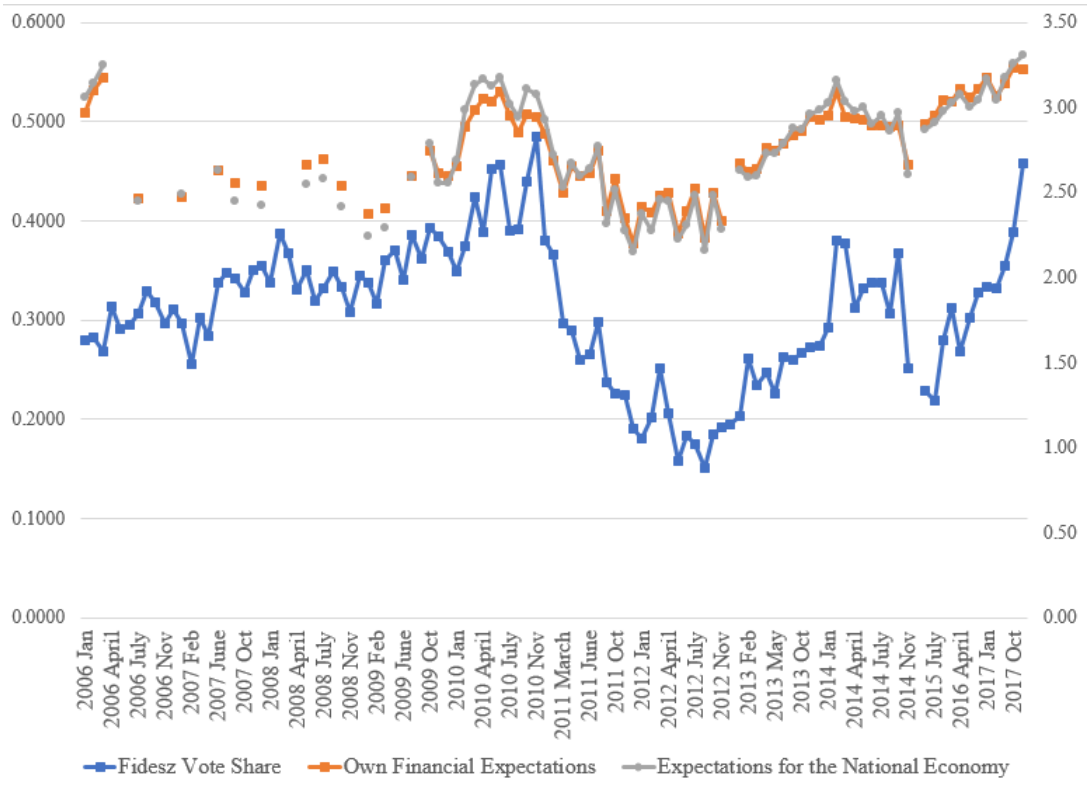

Figure 10: Changes in Fidesz Vote Share and in Individual's 12-month Own Financial Expectations and in Expectations for the National Economy between 2006 and 2018

5 Baseline Estimates

5.1 2006 – 2010

Table 3 lists the regression results for each of the economic voting hypotheses: Column 1 tests pocket voting, columns 2 is devoted for sociotropic voting, column 3 shows estimated coefficients for prospective voting and column 4 shows the regression results including most of the variables.[30][31] Table A28 in Appendix I.1 shows that pocket voting primary works through individual's own perception on their own financial situation rather than trough the actual level (or category) of their income. Column 2 resonates with one of the canonical causal claims in the literature that tests individuals' evaluations of the national economy on their votes (for example Hansford and Gomez (2015)). The effect of perception on the macroeconomic circumstances on incumbent vote share are especially large and statistically significant as compared to those with a very negative perceptions on the national economy. Column 3 provides evidence on prospective voting and shows that expectation on the national economy has a significant explanatory power.

Column 4 presents the main estimated coefficients, and we see important differences in the impact of economic voting variables on incumbent vote share. The effect of the perception on the national economy on vote share are especially strong: the better an individual's perception is as compared to those with a very bad perception on the national economy, the larger the vote share for the incumbent party is. While theories of prospective voting still hold, individuals' expectations on the national economy as a whole seem to explain better the increases in vote shares. For instance, vote share for MSZP–SZDSZ is 15.9 percentage point larger among those survey respondents who have a very good expectation on the national economy for the next year than those who have very bad. Finally, all regres-

[30] Column 1 and Column 4 include data on income category, the estimated coefficients are presented in Table A28 in Appendix I.1. To allow for a non-linear effect of income on party preferences, we rely on individual's income category data, rather than on income level data.

[31] Due to data availability, we are not able to test the retrospective hypothesis before 2010.

sions include covariates capturing demographic characteristics, however, there is no strong gender or education difference on incumbents' vote share.

Table 3: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2006 and 2010

	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ
Perception on own financial situation – Bad	0.026**			-0.012
	(0.011)			(0.012)
Perception on own financial situation – Neither Bad nor good	0.137***			0.011
	(0.011)			(0.013)
Perception on own financial situation – Good	0.244***			0.019
	(0.018)			(0.019)
Perception on own financial situation – Very good	0.109			-0.004
	(0.082)			(0.071)
Perception on the national economy – Bad		0.062***		0.048***
		(0.007)		(0.008)
Perception on the national economy – Neither bad nor good		0.283***		0.235***
		(0.009)		(0.012)
Perception on the national economy – Good		0.533***		0.436***
		(0.025)		(0.029)
Perception on the national economy – Very good		0.585***		0.515***
		(0.165)		(0.166)
Own financial expectations – Bad			0.012	-0.001
			(0.010)	(0.012)
Own financial expectations – Neither bad nor good			0.064***	0.036***
			(0.011)	(0.013)
Own financial expectations – Good			0.056***	0.031*
			(0.015)	(0.017)
Own financial expectations – Very good			-0.065	-0.040
			(0.039)	(0.057)
Expectations for the National Economy – Bad			0.040***	0.009
			(0.009)	(0.011)
Expectations for the National Economy – Neither bad nor good			0.114***	0.046***
			(0.010)	(0.012)
Expectations for the National Economy – Good			0.246***	0.179***
			(0.013)	(0.016)
Expectations for the National Economy – Very good			0.255***	0.159**
			(0.064)	(0.080)
Income categories	Yes	No	No	Yes
Female	0.017**	0.009	0.012*	0.016**
	(0.008)	(0.007)	(0.006)	(0.008)
Secondary education	-0.026***	-0.010	-0.017**	-0.019**
	(0.009)	(0.007)	(0.007)	(0.009)
Higher education	-0.019	0.000	0.002	-0.017
	(0.013)	(0.010)	(0.010)	(0.013)
Constant	0.079***	0.073***	0.051***	-0.007
	(0.023)	(0.007)	(0.008)	(0.025)
Observations	13,327	14,930	16,466	12,053

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes the first 44 waves between January 2006 and February 2010. March and April 2010 waves are not included due to changes in survey methodology. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

5.2 2010–2014

Table 4 reports estimates of the effect of various economic voting variables on the vote intention of a survey respondent.[32] Column 4 presents the estimated coefficients of all covariates, two important results emerge. Besides perceptions and expectations on the national economy, individuals' perceptions as well as their expectations on their own material welfare have strong explanatory power. Second, individuals with a higher education qualification support Fidesz to a lesser degree. As compared to individuals with primary education, survey respondents with a college degree have a 5.2 percentage point lower vote intention for Fidesz.

Table 5 tests retrospective voting and shows that among those who have a very positive view on the general situation in Hungary have a 53.8 percentage point higher Fidesz vote share than among those with a negative opinion on the general trend.

[32] Column 1 and Column 4 include data on income category, the estimated coefficients are presented in Table A29 in Appendix I.2. To allow for a non-linear effect of income on party preferences, we rely on individual's income category data, rather than on income level data.

Table 4: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2010 and 2014

	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz
Perception on own financial situation – Bad	0.016			-0.033**
	(0.014)			(0.016)
Perception on own financial situation – Neither Bad nor good	0.180***			0.050***
	(0.015)			(0.017)
Perception on own financial situation – Good	0.273***			0.054**
	(0.023)			(0.025)
Perception on own financial situation – Very good	-0.004			-0.126**
	(0.067)			(0.064)
Perception on the national economy – Bad		0.097***		0.042***
		(0.009)		(0.013)
Perception on the national economy – Neither bad nor good		0.282***		0.135***
		(0.012)		(0.017)
Perception on the national economy – Good		0.540***		0.276***
		(0.025)		(0.034)
Perception on the national economy – Very good		0.276*		-0.031
		(0.146)		(0.157)
Own financial expectations – Bad			0.034***	-0.006
			(0.008)	(0.018)
Own financial expectations – Neither bad nor good			0.119***	0.054***
			(0.009)	(0.019)
Own financial expectations – Good			0.158***	0.062***
			(0.012)	(0.024)
Own financial expectations – Very good			0.104***	0.006
			(0.030)	(0.064)
Expectations for the National Economy – Bad			0.045***	0.051***
			(0.007)	(0.015)
Expectations for the National Economy – Neither bad nor good			0.147***	0.107***
			(0.009)	(0.016)
Expectations for the National Economy – Good			0.435***	0.392***
			(0.011)	(0.020)
Expectations for the National Economy – Very good			0.517***	0.382***
			(0.038)	(0.064)
Income categories	Yes	No	No	Yes
Female	0.010	0.006	0.007	0.001
	(0.010)	(0.008)	(0.005)	(0.009)
Secondary education	-0.020*	-0.012	-0.028***	-0.014
	(0.011)	(0.009)	(0.005)	(0.011)
Higher education	-0.059***	-0.032***	-0.042***	-0.052***
	(0.015)	(0.012)	(0.007)	(0.015)
Constant	0.179***	0.139***	0.053***	0.059***
	(0.020)	(0.009)	(0.005)	(0.020)
Observations	9,942	13,121	33,369	9,198

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2010 and January 2014. February, March and April 2010 waves are not included due to changes in survey methodology. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

Table 5: The Impact of Retrospective Voting Variables on Incumbent Party Vote Share in Hungary between 2010 and 2014

	Vote share for Fidesz	Vote share for Fidesz
Assessment on the general trends – 1	0.038***	0.037**
	(0.007)	(0.015)
Assessment on the general trends – 2	0.067***	0.048***
	(0.006)	(0.013)
Assessment on the general trends – 3	0.098***	0.071***
	(0.007)	(0.015)
Assessment on the general trends – 4	0.171***	0.119***
	(0.008)	(0.018)
Assessment on the general trends – 5	0.228***	0.173***
	(0.008)	(0.018)
Assessment on the general trends – 6	0.485***	0.368***
	(0.010)	(0.021)
Assessment on the general trends – 7	0.575***	0.431***
	(0.011)	(0.024)
Assessment on the general trends – 8	0.687***	0.527***
	(0.012)	(0.026)
Assessment on the general trends – 9	0.785***	0.591***
	(0.017)	(0.039)
Assessment on the general trends – 10	0.742***	0.538***
	(0.028)	(0.059)
Income categories	No	Yes
Perception on own financial situation	No	Yes
Perception on the national economy	No	Yes
Own financial expectations	No	Yes
Expectations for the National Economy	No	Yes
Female	0.007	0.002
	(0.004)	(0.009)
Secondary education	-0.036***	-0.017
	(0.005)	(0.010)
Higher education	-0.056***	-0.060***
	(0.006)	(0.014)
Constant	0.073***	0.036*
	(0.005)	(0.020)
Observations	35,688	9,123

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2010 and January 2014. February, March and April 2010 waves are not included due to changes in survey methodology. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

5.3 2014 – 2018

Table A31 includes the estimated coefficients on various economic voting variables for the period of 2014 and 2018.[33] Table 7 tests retrospective voting and shows that the relative importance of retrospective voting in explaining support for Fidesz are larger in 2014–2018 than in 2010–2014.

We see important differences in the relative significance of an individual's economic consideration over time. In the second Fidesz era, perceptions on own financial situation turn to be significant, while perception on the national economy as a whole remain – roughly equally – significant in all three periods. The magnitude of the estimated coefficients on expectations for the national economy as a whole – while significant in all periods – are the largest in the 2014 – 2018 period showing that the government was increasingly running on a nationalist-populist platform of economic self-rule (Johnson and Barnes, 2015). Finally, by the third period, individuals with a secondary education and specially with a higher education strongly oppose the ruling Fidesz. Among individuals with a college degree, the vote intention for Fidesz is 9.4 percentage point lower than amoung those with a primary education (and this difference was 5.2 percentage point in 2010–2014).

[33] Column 1 and Column 4 include data on income category, the estimated coefficients are presented in Table A30 in Appendix I.3. To allow for a non-linear effect of income on party preferences, we rely on individual's income category data, rather than on income level data.

Table 6: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2014 and 2018

	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz
Perception on own financial situation – Bad	0.040*			-0.002
	(0.022)			(0.025)
Perception on own financial situation – Neither Bad nor good	0.170***			-0.011
	(0.022)			(0.025)
Perception on own financial situation – Good	0.475***			0.126***
	(0.027)			(0.031)
Perception on own financial situation – Very good	0.575***			0.149**
	(0.082)			(0.070)
Perception on the national economy – Bad		0.035***		0.026
		(0.012)		(0.018)
Perception on the national economy – Neither bad nor good		0.290***		0.232***
		(0.013)		(0.021)
Perception on the national economy – Good		0.685***		0.445***
		(0.017)		(0.029)
Perception on the national economy – Very good		0.772***		0.458***
		(0.062)		(0.096)
Own financial expectations – Bad			-0.010	-0.049
			(0.015)	(0.033)
Own financial expectations – Neither bad nor good			0.061***	-0.030
			(0.015)	(0.032)
Own financial expectations – Good			0.102***	-0.046
			(0.018)	(0.036)
Own financial expectations – Very good			0.126***	-0.040
			(0.044)	(0.076)
Expectations for the National Economy – Bad			0.016	0.002
			(0.011)	(0.022)
Expectations for the National Economy – Neither bad nor good			0.194***	0.076***
			(0.012)	(0.023)
Expectations for the National Economy – Good			0.528***	0.284***
			(0.015)	(0.029)
Expectations for the National Economy – Very good			0.656***	0.422***
			(0.041)	(0.067)
Income Categories	Yes	No	No	Yes
Female	0.045***	0.040***	0.041***	0.034***
	(0.013)	(0.009)	(0.007)	(0.012)
Secondary education	-0.062***	-0.045***	-0.040***	-0.053***
	(0.014)	(0.010)	(0.008)	(0.014)
Higher education	-0.108***	-0.058***	-0.060***	-0.094***
	(0.021)	(0.014)	(0.010)	(0.020)
Constant	0.179***	0.061***	0.031***	0.061
	(0.032)	(0.012)	(0.011)	(0.037)
Observations	5,719	8,723	17,232	5,275

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2014 and January 2018. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

Table 7: The Impact of Retrospective Voting Variables on Incumbent Party Vote Share in Hungary between 2014 and 2018

	Vote share for Fidesz	Vote share for Fidesz
Assessment on the general trends – 1	0.026	0.013
	(0.032)	(0.011)
Assessment on the general trends – 2	-0.017	0.012
	(0.025)	(0.009)
Assessment on the general trends – 3	-0.010	0.037***
	(0.027)	(0.010)
Assessment on the general trends – 4	0.020	0.083***
	(0.032)	(0.012)
Assessment on the general trends – 5	0.089***	0.172***
	(0.033)	(0.011)
Assessment on the general trends – 6	0.251***	0.421***
	(0.038)	(0.014)
Assessment on the general trends – 7	0.406***	0.592***
	(0.040)	(0.013)
Assessment on the general trends – 8	0.520***	0.731***
	(0.042)	(0.014)
Assessment on the general trends – 9	0.582***	0.840***
	(0.050)	(0.017)
Assessment on the general trends – 10	0.257**	0.800***
	(0.105)	(0.029)
Income categories	No	Yes
Perception on own financial situation	No	Yes
Perception on the national economy	No	Yes
Own financial expectations	No	Yes
Expectations for the National Economy	No	Yes
Female	0.030**	0.029***
	(0.015)	(0.007)
Secondary education	-0.048***	-0.060***
	(0.016)	(0.007)
Higher education	-0.087***	-0.067***
	(0.024)	(0.009)
Constant	0.107**	0.060***
	(0.045)	(0.008)
Observations	3,298	15,571

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2014 and January 2018. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

6 Advanced Estimates

We now turn to the debate that revolves around the question of whether we can disentangle partisanship from economic perceptions. The economic voting literature is nearly unanimous in finding that the effect of the economic perceptions of an individual on party preferences are driven by partisan dispositions and thus this relation is plagued by endogeneity (see Section 2.3.1). This Section follows the identification strategy of Healy, Persson and Snowberg (2017) – introduced in Section 2.4.2 – and estimates voters' perceptions on the national economy on party preferences by relying on objective measures of the economy.

This Section complements and adds to the existing empirical literature. First, due to the availability of data, we are able to control for year specific events that affected individuals equally, such as for the pattern of the global business cycle or for the migrant crisis in 2015 and 2016. Similarly, the inclusion of county level fixed effects allows us to control for time invariant county characteristics that possible affect our story. As an example, the county fixed effect controls for county specific religious patterns, for instance, Hajdú-Bihar county traditionally has the strongest Protestant heritage in Hungary. Second, to our knowledge, this is the first paper that instruments the endogenous perception on national economy variable with a set of objective local level economic variables as well as with a set of objective national level economic variables.

To capture the exogenous variation in the perception variable, we estimate variations in the perception on national economic circumstance with the most widely cited economic measures in the literature (Fidrmuc, 2000; Roberts, 2008; Tucker, 2001). In particular, we first rely on *local level* objective measures: changes in income level at settlement level as well as changes in unemployment rate. We then turn to *national level* macroeconomic variables: GDP growth rate and changes in the unemployment rate as potential sources of exogenous variations in the perception on national economy. Table 8 presents the descriptive statistics for the main instruments used. Settlement level data are from the Center for Economic and

Regional Studies – Hungarian Academy of Sciences.

Table 8: Descriptive Statistics of the Instruments

	Number of Observations	Weights	Mean	Standard Deviations	Minimum	Maximum
Changes in per capita income at settlement level	37,130	36704.50	29.66	42.21	-132.50	207.58
Changes in unemployment rate at settlement level	37,130	36704.50	-0.01	0.02	-0.18	0.12
GDP growth	49,983	49823.74	101.74	2.08	97.6	104.7
Changes in unemployment rate at national level	49,983	49823.74	-0.09	0.64	-1.30	1.80

Note: Results are population weighted.

Table 9 presents basic correlations between the main explanatory variable, an individual's perception on the national economy and on the main instruments. The first column shows that changes in income at local level and GDP growth rate at national level positively correlate with an individual's perception on national economy. In other words, the better the economy is doing both at local and at national level, the more favourable an individual sees the economy as a whole. In contrast, there is a negative correlation between the perception on national economy and changes in local and national level unemployment rate. An increase in unemployment rate at settlement and at national level comes with a more pessimistic perception on the national economy.

Table 9: Correlation Matrix – Individuals' Perception on National Economy and the Instruments

	Perception	ΔLocal Income	ΔLocal Unemployment	GDP Growth	Δ National Unemployment
Perception	1.00				
ΔLocal Income	0.16*	1.00			
	0.00				
ΔLocal Unemployment	-0.07*	-0.03*	1.00		
	0.00	0.00			
GDP Growth	0.28*	0.37*	-0.29*	1.00	
	0.00	0.00	0.00		
ΔLocal Unemployment	-0.03*	-0.03*	0.06*	-0.13*	1.00
	0.00	0.00	0.00	0.00	

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Formally, we estimate the following equations:

$$y_{i,t} = \beta_1 X_{i,t} + C'_{i,t}\gamma + \phi_t + \psi_i + \epsilon_{i,t} \tag{5}$$

$$X_{i,t} = Z'_{i,t}\alpha + C'_{i,t}\gamma + \phi_t + \psi_i + \nu_{i,t} \tag{6}$$

where equation (5) is the second stage of the two-stage-least-square estimation and equation (6). The main dependent variable, y_i is a binary variable equals 1 if individual i voted for the incumbent and zero otherwise. Variable $X_{i,t}$ is the endogenous perception on national economic circumstances. $C'_{i,t}$ are individual specific covariates such level of education and gender. The instruments in equation (6) are macroeconomic objective measures defined at local level (changes in income at settlement level; changes in unemployment at settlement level) and national level (GDP growth rate and changes in unemployment rate at national level). Due to availability of data, we focus on the time period between May 2010 and October 2015.

Table 10 presents the main results. Columns 1 and 2 estimate the effect of national economy perception on party preferences using only local level objective measures, while Columns 3 and 4 use the potentially exogenous source of variations in macroeconomic variables at national level. Columns 5 and 6 show the estimated coefficients when relying on both the national as well as on local level objective economic measures. While Columns 2, 4, 6 include all the control variables, Columns 1, 3 and 5 only control for year and county fixed effects. Two main results emerge. First, OLS regressions systematically overestimate the effect of individuals' perception on their own national economy on party preferences. If we only rely on the variations in perception that is estimated by the changes in the actual and objective measures, we calculate a smaller – in magnitude – coefficient. It has important implication for the survey-based literature that make conclusions based on only subjective perception measures. Second, the fit of the first stage is the strongest in Columns 3 and 4

in Panel B that implies that perception on national economy is indeed driven by national level macro measures (such as GDP growth rate and changes in unemployment rate) and not by local level economic variables.

Table 10: The Effect of Individuals' Perception on Party Preference – A Two-Stage-Least Square Estimation

	Preferences		Preferences		Preferences	
	Driven by Local Economy		Driven by National Economy		Driven by Local and National Economy	
	(1)	(2)	(3)	(4)	(5)	(6)
	Vote share	Vote share	Vote share	Vote share	Vote share	Vote share
Panel A. 2SLS						
Perception on national economy	0.463**	0.669	0.217***	0.254***	0.243***	0.273***
	(0.226)	(0.544)	(0.053)	(0.076)	(0.052)	(0.072)
Confounders	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,213	13,094	20,722	16,908	16,213	13,094
Panel B. First Stage						
Cragg-Donald Wald F statistic	4.26	1.22	54.30	33.02	28.68	18.73
Kleibergen-Paap Wald rk F statistic	4.16	1.14	53.03	31.30	27.66	17.93

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The confounders (perception on own economic circumstances; gender; education) included are indicated by yes or no. Coefficients are reported with robust standard errors clustered at the country level in parentheses.

7 Conclusion

Political scientists and economists are unanimous in their findings that the state of the economy affects elections. The theory of economic voting attempts to understand the mechanism causing the observed relationship between the economy and election. Economic voting is grounded in the reward–punishment axiom with roots in rational choice models and works with the assumption that voters punish governments for poor economic performance by voting against them but award incumbents for a prospering economy by re-electing them. In this sense, voters are rational, self-interested actors who opt for candidates or parties that are most likely to implement the economic policies favoured by them.

Hundreds of articles have been written on this subject, attempting to specify how the economy determines voting behaviour and an individual's party preference; to identify the individual-level calculations; and to test whether voters act as sophisticated optimisers or clueless rubes. Scholars have developed an interest in considering whether voters are actually looking at the state of the aggregate economy in voting (sociotropic voting), or whether they are more concerned about their own personal economic situation (pocketbook voting). At the same time, many also has wondered whether voters are looking backwards and assess the past performance of the economy (retrospective voting) or forward in time (prospective voting).

One of the aims of the dissertation is to paint a full picture of the economic voters and to test all four aspects of the economic voting literature. By doing so, the main goal is to confirm or to reject that voters form their party preferences in line with the economic voting theory. We rely on an extremely granular data, on a long repeated cross-sectional individual surveys with 108 442 face-to-face individual level interviews between 2006 and 2018 in Hungary. This dataset allows us to to test all fours economic premises in one equation and to precisely estimate the effect of sociotropic voting, pocketbook voting, retrospective voting as well as prospective voting without leaving any of these variables in the error term.

With this specification, the conclusion on how economic voting works is more precise. In addition to this, the dataset allows us to estimate how the relative importance of the four economic voting hypotheses were changing over time and relative to each other.

The main findings reveal the changing importance of pocketbook voting and that pocketbook consideration became important between 2014 and 2018 in Hungary. Estimation results also elucidate the importance of sociotropic voting and show that sociotropic considerations remain robust over the period of the research. Finally, we provide evidence that retrospective and prospective voting on the national economy explain party preferences with the former having larger effect that gets more significant over time.

A strain of the literature on economic voting also warns us that estimates of the impact of economic perceptions, and thus of economic conditions, on voting have been vastly exaggerated because economic perceptions are themselves influenced by the respondents' vote choice. Nonetheless, if there is reverse causality and if the economic perceptions are caused by the vote choice, then the inference that economic perceptions affect vote choice would be invalidated. In other words, if voters who are in support of the incumbent party rationalise their response to the economic perception question by stating that the economy has been good, then we cannot conclude that perceptions influence party preferences. Endogeneity is a pressing concern that biases the estimates of the impact of perceived economic conditions on vote choice.

To overcome the issue of reverse causality, this dissertation merges the survey data with national and local economic measures between 2006 and 2015. This enables us to link local economic measures (such as changes in settlement level income and changes in settlement level unemployment rate) as well as national economy measures (such as GDP growth or changes in unemployment measures) to survey respondents. This unique dataset allows us to predict the exogenous variations in individuals' national perception measures and thus to provide an unbiased estimation. It further enables us to test how changes in objective

economic measures at local as well as at national level explain individuals' perceptions and in turn their party preferences. We first rely on two *local level* objective measures: changes in income at settlement level as well as changes in unemployment rate. We then turn to *national level* macroeconomic variables: GDP growth rate and changes in the unemployment rate as potential sources of exogenous variations in the perception on national economy variable.

With respect to objective economic indicators, voters seem to form their perception on national economy by looking at changes in national level GDP as well as changes in national level unemployment rate rather than by assessing any changes in their settlement level economic measures. Thus, we find that individuals' perceptions about the macroeconomy are reasonably well informed; voters appear to understand the extent to which their local economy is different from the national economy. Overall, voters achieve a good understanding of their economic world and they have a reasonably precise picture of their national economy and vote punitively on that basis.

There are many limitations of this dissertation. Acknowledging such limitations is important, as they can point other researchers to areas that require future study. Despite the economy's obvious importance as a source of economic voting, there are several other concerns and questions that should be considered when thinking about economic voters. *First*, while citizens can see the economy, they do not see it perfectly, and therefore economic perceptions are not flawless. These errors of judgment occur as voters vary in the amount of information they have. As such, probably voters with more information do not weigh pocketbook and sociotropic evaluations the same way. This dissertation does not look at the process of collecting and assessing information and at the factors that influence this process nor does it examine the calculus of an individual.

Second, some would argue that the major source of distortion comes from politics and individuals partisanship. That is, a voter's partisanship imposes a conceptual blinder, rendering

economic judgments a mere reflection of the partisanship of the voters. However, the extent to which partisanship affect the perception and vote share relation is not homogeneous across individuals. Some individuals have very strong interest in politics and very strong sense of belonging to one particular party, while others are less concerned by partisanship. The dissertation does not distinguish between individuals who are less or more affected by the concern of endogeneity.

A third limitation is that while this piece seeks to exogenise sociotropic economic perceptions and concludes that economic perceptions appear to be strongly shaped by the objective economy, it does not offer a solution for the other potentially endogenous variable: perception on own financial circumstances. A potential gap in the literature is that none of the existing survey-based papers – to our best knowledge – overcome the issue of endogeneity and identify potential sources of exogenous variations for the perception on the national economy as well as for the perception on own financial circumstances variables.

Fourth, maybe voters perceptions are driven by one particular macroeconomic measure at a time (e.g.: GDP growth rate) and by another one at another point in time (e.g.: inflation). It is unclear which economic indicators should be indicative of government performance at a given year and how the "informativeness" of one macroeconomic variable is changing over time. It is particularly interesting since some are negatively correlated and have different distributional implications (e.g., unemployment versus inflation).

Fifth, it would also be worth considering how political rhetoric and political framing push voters closer to one particular economic measure over the others. One should devote more time to understand how salient issues – such as attitudes towards EU and migration – matter and whether the ultimate determinant is the interaction between economics and values.

Sixth, it is unclear whether voters should care more about levels or changes in economic indicators (or maybe even the second derivative), and which baselines they should be using. While we rely on changes in objective measures from one year to the next one, it would

have been worth investigating how four year changes in the indicators alter the estimation.

Finally, future research could devote an extra effort to unpacking the black box of attribution. It is indeed extremely difficult to tie the actions of politicians to particular macroeconomic outcomes and to decide when the previous administration should stop receiving credit and blame for the current administration's record. Attribution, the process by which voters allocate blame and credit to political actors, should be extensively researched.

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A Appendix: Descriptive Statistics by Waves

Table A1: Number of Respondents, the Share of Respondent with Party Preferences and the Proportion of Female Respondents in Omnibusz Surveys

Omnibusz Interview Year	Omnibusz Interview Month	Number of Survey Respondents	Share of Survey Respondent with Party Preferences	Proportion of Female Respondents
2006	January	1,010	0.6298	0.5304
2006	February	1,019	0.6278	0.5336
2006	March	1,038	0.6642	0.5413
2006	April	1,033	0.7960	0.5340
2006	May	1,033	0.7597	0.5350
2006	June	1,033	0.6672	0.5341
2006	July	1,033	0.6405	0.5341
2006	September	1,033	0.5821	0.5336
2006	October	1,033	0.6254	0.5325
2006	November	1,033	0.6086	0.5340
2006	December	1,033	0.6009	0.5339
2007	January	1,033	0.5486	0.5336
2007	February	1,030	0.5583	0.5327
2007	March	1,030	0.5847	0.5343
2007	May	1,030	0.5680	0.5340
2007	June	1,033	0.6014	0.5356
2007	July	1,033	0.6791	0.5332
2007	September	1,031	0.5778	0.5342
2007	October	1,031	0.5343	0.5357
2007	November	1,031	0.5472	0.5352
2007	December	1,027	0.5541	0.5390
2008	January	1,031	0.5532	0.5377
2008	February	1,029	0.6124	0.5337
2008	March	1,010	0.5744	0.5338
2008	April	1,010	0.5156	0.5339
2008	May	1,010	0.5626	0.5401
2008	June	1,010	0.5718	0.5363
2008	July	1,010	0.5618	0.5355
2008	September	1,014	0.5995	0.5352
2008	October	1,009	0.5531	0.5357
2008	November	1,006	0.6002	0.5363
2008	December	1,010	0.5810	0.5330

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

Table A2: Number of Respondents, the Share of Respondent with Party Preferences and the Proportion of Female Respondents in Omnibusz Surveys

Omnibusz Interview Year	Omnibusz Interview Month	Number of Survey Respondents	Share of Survey Respondent with Party Preferences	Proportion of Female Respondents
2009	January	1,007	0.5771	0.5355
2009	February	1,010	0.5407	0.5345
2009	April	1,010	0.5754	0.5326
2009	May	1,009	0.5887	0.5345
2009	June	1,009	0.5958	0.5316
2009	July	1,009	0.6275	0.5334
2009	September	1,010	0.5844	0.5326
2009	October	1,010	0.6246	0.5339
2009	November	1,010	0.6114	0.5351
2009	December	1,007	0.6057	0.5326
2010	January	1,010	0.5749	0.5341
2010	February	1,009	0.6620	0.5341
2010	March	1,013	0.6989	0.5321
2010	April	1,013	0.5987	0.5416
2010	May	1,013	0.7076	0.5340
2010	June	1,012	0.6837	0.5336
2010	July	1,001	0.6557	0.5336
2010	September	1,013	0.6012	0.5341
2010	October	1,008	0.6664	0.5341
2010	November	1,010	0.6884	0.5336
2011	January	1,012	0.5822	0.5351
2011	February	1,010	0.6044	0.5346
2011	March	1,012	0.5436	0.5341
2011	April	1,014	0.5470	0.5340
2011	May	1,013	0.5392	0.5341
2011	June	1,013	0.5031	0.5341
2011	July	1,011	0.5624	0.5341
2011	September	1,011	0.4782	0.5341
2011	October	1,011	0.4930	0.5341
2011	November	1,010	0.5154	0.5341
2011	December	1,011	0.4745	0.5341

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

Table A3: Number of Respondents, the Share of Respondent with Party Preferences and the Proportion of Female Respondents in Omnibusz Surveys

Omnibusz Interview Year	Omnibusz Interview Month	Number of Survey Respondents	Share of Survey Respondent with Party Preferences	Proportion of Female Respondents
2012	January	1,011	0.4852	0.5341
2012	February	1,010	0.5183	0.5341
2012	March	1,012	0.5624	0.5341
2012	April	1,011	0.5331	0.5341
2012	May	1,012	0.4971	0.5341
2012	June	1,009	0.5064	0.5341
2012	July	999	0.4683	0.5341
2012	September	1,010	0.4434	0.5336
2012	October	1,011	0.4960	0.5341
2012	November	1,010	0.5285	0.5341
2012	December	1,012	0.4953	0.5341

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

Table A4: Number of Respondents, the Share of Respondent with Party Preferences and the Proportion of Female Respondents in Omnibusz Surveys

Omnibusz Interview Year	Omnibusz Interview Month	Number of Survey Respondents	Share of Survey Respondent with Party Preferences	Proportion of Female Respondents
2013	January	1,012	0.5072	0.5341
2013	February	1,012	0.5435	0.5341
2013	March	1,012	0.4926	0.5346
2013	April	1,012	0.5082	0.5341
2013	May	1,012	0.4925	0.5341
2013	June	1,011	0.5415	0.5341
2013	July	1,011	0.5413	0.5341
2013	October	1,007	0.5455	0.5337
2013	November	1,007	0.5685	0.5601
2013	December	1,007	0.5828	0.5337
2014	January	1,007	0.6022	0.5337
2014	February	1,007	0.7831	0.5337
2014	March	1,007	0.7411	0.5337
2014	April	1,006	0.5237	0.5337
2014	May	1,007	0.6116	0.5337
2014	June	1,007	0.6058	0.5337
2014	July	1,007	0.6183	0.5337
2014	September	1,007	0.5698	0.5337
2014	October	1,007	0.6629	0.5337
2014	November	1,006	0.5561	0.5337
2015	January	1,004	0.5776	0.5337
2015	April	1,004	0.5968	0.5338
2015	July	1,001	0.5548	0.5337
2015	October	1,003	0.5492	0.5337
2016	January	1,001	0.5838	0.5337
2016	April	1,000	0.5689	0.5337
2016	July	999	0.6201	0.5337
2016	October	995	0.6003	0.5337
2017	January	999	0.6456	0.5337
2017	April	1,002	0.6467	0.5337
2017	July	1,017	0.6404	0.5359
2017	October	1,017	0.6630	0.5337
2018	January	1,012	0.7432	0.5337

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

B Appendix: Party Preferences by Survey Waves

Table A5: Vote Share for Fidesz and for the Opposition by Survey Waves

Omnibusz Interview Year	Omnibusz Interview Month	Vote Share for Fidesz	Vote Share for MSZP-SZDSZ
2006	January	0.281	0.3020
2006	February	0.283	0.3109
2006	March	0.269	0.3584
2006	April	0.314	0.4269
2006	May	0.291	0.4129
2006	June	0.295	0.3229
2006	July	0.307	0.2575
2006	September	0.329	0.2010
2006	October	0.319	0.2625
2006	November	0.297	0.2368
2006	December	0.310	0.2349
2007	January	0.297	0.1893
2007	February	0.255	0.2201
2007	March	0.303	0.2138
2007	May	0.285	0.1913
2007	June	0.338	0.1864
2007	July	0.347	0.2385
2007	September	0.342	0.1782
2007	October	0.328	0.1578
2007	November	0.350	0.1510
2007	December	0.355	0.1493
2008	January	0.337	0.1605
2008	February	0.388	0.1728
2008	March	0.367	0.1460
2008	April	0.331	0.1279
2008	May	0.350	0.1562
2008	June	0.319	0.1911

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. During 2006–2010, MSZP–SZDSZ formed the ruling party (Columns 4); while Fidesz became the incumbent party in 2010 (Columns 3) (see Section 3.1). Means are population weighted.

Table A6: Vote Share for Fidesz and for the Opposition by Survey Waves

Omnibusz Interview Year	Omnibusz Interview Month	Vote Share for Fidesz	Vote Share for MSZP-SZDSZ
2008	July	0.331	0.1786
2008	September	0.349	0.1633
2008	October	0.334	0.1709
2008	November	0.308	0.2241
2008	December	0.345	0.1734
2009	January	0.338	0.1910
2009	February	0.316	0.1411
2009	April	0.360	0.1438
2009	May	0.370	0.1503
2009	June	0.340	0.1439
2009	July	0.385	0.1172
2009	September	0.361	0.1280
2009	October	0.393	0.1180
2009	November	0.385	0.1147
2009	December	0.369	0.1209
2010	January	0.349	0.1257
2010	February	0.374	0.1516
2010	March	0.424	0.1262
2010	April	0.388	0.0957
2010	May	0.452	0.1067
2010	June	0.457	0.1016
2010	July	0.391	0.1320
2010	September	0.392	0.1039
2010	October	0.440	0.1061
2010	November	0.485	0.0994

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. During 2006–2010, MSZP–SZDSZ formed the ruling party (Columns 4); while Fidesz became the incumbent party in 2010 (Columns 3) (see Section 3.1). Means are population weighted.

Table A7: Vote Share for Fidesz and for the Opposition by Survey Waves

Omnibusz Interview Year	Omnibusz Interview Month	Vote Share for Fidesz	Vote Share for MSZP-SZDSZ
2011	January	0.381	0.0968
2011	February	0.367	0.1084
2011	March	0.296	0.1116
2011	April	0.290	0.1194
2011	May	0.261	0.1362
2011	June	0.266	0.1219
2011	July	0.298	0.1142
2011	September	0.237	0.0999
2011	October	0.225	0.1086
2011	November	0.225	0.1039
2011	December	0.190	0.1174
2012	January	0.181	0.1125
2012	February	0.201	0.1323
2012	March	0.252	0.1184
2012	April	0.206	0.1337
2012	May	0.158	0.1531
2012	June	0.184	0.1387
2012	July	0.175	0.1156
2012	September	0.151	0.1067
2012	October	0.184	0.1480
2012	November	0.192	0.1361
2012	December	0.194	0.1193
2013	January	0.204	0.1436
2013	February	0.261	0.1198
2013	March	0.235	0.0897
2013	April	0.248	0.1086
2013	May	0.226	0.1063
2013	June	0.262	0.1286
2013	July	0.260	0.1089
2013	October	0.267	0.1107
2013	November	0.273	0.1162
2013	December	0.275	0.1119

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. During 2006–2010, MSZP–SZDSZ formed the ruling party (Columns 4); while Fidesz became the incumbent party in 2010 (Columns 3) (see Section 3.1). Means are population weighted.

Table A8: Vote Share for Fidesz and for the Opposition by Survey Waves

Omnibusz Interview Year	Omnibusz Interview Month	Vote Share for Fidesz	Vote Share for MSZP-SZDSZ
2014	January	0.2921	0.1383
2014	February	0.380	0.2075
2014	March	0.377	0.0409
2014	April	0.313	0.1096
2014	May	0.332	0.1047
2014	June	0.338	0.0927
2014	July	0.337	0.0938
2014	September	0.306	0.1037
2014	October	0.367	0.1093
2014	November	0.251	0.1129
2015	January	0.2354	0.1068
2015	April	0.229	0.1039
2015	July	0.218	0.1076
2015	October	0.280	0.0745
2016	January	0.313	0.0685
2016	April	0.269	0.1036
2016	July	0.303	0.0799
2016	October	0.328	0.0883
2017	January	0.333	0.0942
2017	April	0.332	0.0972
2017	July	0.354	0.0707
2017	October	0.388	0.0802
2018	January	0.458	0.0499

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. During 2006–2010, MSZP–SZDSZ formed the ruling party (Columns 4); while Fidesz became the incumbent party in 2010 (Columns 3) (see Section 3.1). Means are population weighted.

C Appendix: Individuals' and Households Income Variables - A Descriptive Statistics

C.1 Individuals' Income

Income Categories of Survey Respondents:

- The value of -6: the respondent was not asked;
- The value of 1: 20,000 HUF or less;
- The value of 2: 21,000 HUF – 40,000 HUF;
- The value of 3: 41,000 – 70,000 HUF;
- The value of 4: 71,000 – 100,000 HUF;
- The value of 5: 101,000 – 150,000HUF;
- The value of 6: 151,000 – 200,000 HUF;
- The value of 7: 201,000 – 300,000 HUF;
- The value of 8: 301,000 – 500,000 HUF;
- The value of 9: 500,000 HUF or more;
- The value if 88: the respondent does not know the answer;
- The value of 99: the respondent refused to answer

Average Net Self-Declared Income of the Survey Respondent by Income Categories:

- The value of 1: 20,000 HUF or less – Average: HUF 15134.81
- The value of 2: 21,000 HUF – 40,000 HUF – Average: HUF 29446.45
- The value of 3: 41,000 – 70,000 HUF – Average: HUF 59007.80
- The value of 4: 71,000 – 100,000 HUF – Average: HUF 85918.45

- The value of 5: 101,000 – 150,000HUF – Average: HUF 124668.10
- The value of 6: 151,000 – 200,000 HUF – Average: HUF 175682.40
- The value of 7: 201,000 – 300,000 HUF – Average: HUF 246301.40
- The value of 8: 301,000 – 500,000 HUF – Average: HUF 378211.00
- The value of 9: 500,000 HUF or more – Average: HUF 997895.10

Table A9: Descriptive Statistics – Individuals' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2006	January	832	69528	46787	15135	997895
2006	February	857	70853	43929	15135	997895
2006	March	870	75257	47238	15135	378211
2006	April	876	78272	50091	15135	378211
2006	May	919	78736	45431	15135	378211
2006	June	884	73376	42970	15135	378211
2006	July	875	75892	47070	15135	997895
2006	September	862	73691	40991	15135	378211
2006	October	861	79644	66496	15135	997895
2006	November	877	81942	70588	15135	997895
2006	December	849	77649	52670	15135	997895
2007	January	867	76859	55548	15135	997895
2007	February	841	79404	52558	15135	997895
2007	March	841	77663	47889	15135	997895
2007	May	865	93871	128217	15135	997895
2007	June	859	76546	37684	15135	378211
2007	July	821	79346	40242	15135	378211
2007	September	842	78568	36432	15135	378211
2007	October	842	81835	52645	15135	997895
2007	November	837	81514	60394	15135	997895
2007	December	842	80078	40168	15135	378211
2008	January	886	82371	51425	15135	997895
2008	February	879	83838	53734	15135	997895
2008	March	839	83443	49165	15135	997895
2008	April	829	84747	44667	15135	378211
2008	May	815	86737	56399	15135	997895
2008	June	853	85766	55867	15135	997895
2008	July	850	85812	49707	15135	997895
2008	September	847	89856	46156	15135	378211
2008	October	845	90229	59688	15135	997895
2008	November	851	87957	51401	15135	997895
2008	December	825	85908	38860	15135	378211

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

Table A10: Descriptive Statistics – Individuals' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2009	January	829	84722	39434	15135	378211
2009	February	803	88212	48796	15135	378211
2009	April	795	85123	46385	15135	378211
2009	May	815	88953	55535	15135	997895
2009	June	823	88789	48717	15135	378211
2009	July	819	90946	57593	15135	997895
2009	September	807	88987	46533	15135	378211
2009	October	797	88113	57672	15135	997895
2009	November	829	94533	69397	15135	997895
2009	December	781	90292	53609	15135	997895
2010	January	792	88672	56596	15135	997895
2010	February	851	87954	52368	15135	997895
2010	March	856	87248	46099	15135	378211
2010	April	839	94137	58429	15135	997895
2010	May	859	90322	44955	15135	378211
2010	June	787	88122	44054	15135	378211
2010	July	839	90034	43286	15135	378211
2010	September	826	88758	43420	15135	378211
2010	October	817	90813	46296	15135	378211
2010	November	826	91836	44207	15135	378211
2011	January	679	84127	58378	15135	997895
2011	February	803	84776	42198	15135	378211
2011	March	809	87277	54441	15135	997895
2011	April	765	87292	46599	15135	378211
2011	May	777	95399	87605	15135	997895
2011	June	780	87335	44083	15135	378211
2011	July	842	89416	55179	15135	997895
2011	September	804	91105	60253	15135	997895
2011	October	800	90915	57815	15135	997895
2011	November	813	89453	55201	15135	997895
2011	December	792	88463	44678	15135	378211
2012	January	795	87587	49246	15135	378211
2012	February	760	90660	50364	15135	378211
2012	March	774	91194	46046	15135	378211
2012	April	783	95806	75225	15135	997895
2012	May	774	92425	58616	15135	997895
2012	June	765	88354	44188	15135	378211
2012	July	790	95356	51173	15135	378211
2012	September	777	90759	49543	15135	378211
2012	October	808	92081	59169	15135	997895
2012	November	788	88033	69405	15135	997895
2012	December	770	90086	43907	15135	378211

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

Table A11: Descriptive Statistics – Individuals' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2013	January	780	92455	50459	15135	378211
2013	February	791	92950	57899	15135	997895
2013	March	738	96211	58790	15135	997895
2013	April	784	98362	61663	15135	997895
2013	May	753	99413	65772	15135	997895
2013	June	735	96931	45325	15135	378211
2013	July	826	100591	57298	15135	997895
2013	October	786	105205	64279	15135	378211
2013	November	798	106549	55439	15135	378211
2013	December	753	104536	52069	15135	378211
2014	January	823	108509	77515	15135	997895
2014	February	782	104784	60110	15135	997895
2014	March	726	107616	74111	15135	997895
2014	April	743	106110	82536	15135	997895
2014	May	734	105667	64156	15135	997895
2014	June	717	109912	72518	15135	997895
2014	July	742	106851	52652	15135	378211
2014	September	671	105046	59415	15135	997895
2014	October	763	107796	60370	15135	997895
2014	November	696	106468	52198	15135	378211
2015	January	751	105529	65049	15135	997895
2015	April	730	117151	78479	15135	997895
2015	July	728	115139	63501	15135	997895
2015	October	703	118606	79083	15135	997895
2016	January	728	119341	76548	15135	997895
2016	April	719	114993	57137	15135	378211
2016	July	709	124839	68796	15135	997895
2016	October	703	118393	56236	15135	378211
2017	January	723	128060	60576	15135	378211
2017	April	707	126775	61552	15135	378211
2017	July	724	135458	72863	15135	997895
2017	October	777	141866	91698	15135	997895
2018	January	764	136756	63574	15135	378211

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted.

C.2 Households' Income

Household Income Categories:

- The value of -6: the household was not asked;
- The value of 1: 60,000 HUF or less;
- The value of 2: 61,000–90,000 HUF;
- The value of 3: 91,000–120,000 HUF;
- The value of 4: 121,000–150,000 HUF;
- The value of 5: 151,000–200,000 HUF;
- The value of 6: 201,000–300,000 HUF;
- The value of 7: 301,000–500,000 HUF;
- The value of 8: 501,000–1,000,000 HUF;
- The value of 9: 1,000,000 HUF or more;
- The value if 88: does not know the answer;
- The value of 99: refused to answer;

Average Net Self-Declared Income of the Households by Income Categories:

- The value of 1: 60,000 HUF or less – Average: HUF 45918.16
- The value of 2: 61,000–90,000 HUF – Average: HUF 76866.94
- The value of 3: 91,000–120,000 HUF – Average: HUF 106935.6
- The value of 4: 121,000–150,000 HUF – Average: HUF 139799.1
- The value of 5: 151,000–200,000 HUF – Average: HUF 180417.9
- The value of 6: 201,000–300,000 HUF – Average: HUF 250996

- The value of 7: 301,000–500,000 HUF – Average: HUF 373857.2
- The value of 8: 501,000–1,000,000 HUF – Average: HUF 627850.5
- The value of 9: 1,000,000 HUF or more – Average: HUF 6730554

Table A12: Descriptive Statistics – Households' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2006	January	836	136566.20	76269.31	45918.16	627850.50
2006	February	873	147157.50	83534.12	45918.16	627850.50
2006	March	875	160386.10	92156.25	45918.16	627850.50
2006	April	877	144519.00	86668.76	45918.16	627850.50
2006	May	909	156072.40	333767.20	45918.16	6730554.00
2006	June	869	136602.10	82502.00	45918.16	627850.50
2006	July	874	140545.60	78840.65	45918.16	627850.50
2006	September	880	138153.30	78192.83	45918.16	627850.50
2006	October	888	155168.10	303072.20	45918.16	6730554.00
2006	November	874	144300.00	82192.70	45918.16	627850.50
2006	December	869	141235.70	80436.62	45918.16	627850.50
2007	January	889	144088.30	73041.33	45918.16	627850.50
2007	February	873	144873.00	82489.29	45918.16	627850.50
2007	March	845	176561.80	455629.10	45918.16	6730554.00
2007	May	867	237117.90	743399.40	45918.16	6730554.00
2007	June	872	148804.60	78278.11	45918.16	627850.50
2007	July	852	144088.00	72810.89	45918.16	373857.20
2007	September	865	151634.60	83428.33	45918.16	627850.50
2007	October	873	155211.60	232229.90	45918.16	6730554.00
2007	November	848	161987.20	329910.90	45918.16	6730554.00
2007	December	858	155102.50	261796.80	45918.16	6730554.00
2008	January	922	154788.50	85007.00	45918.16	627850.50
2008	February	907	157717.50	84543.71	45918.16	627850.50
2008	March	839	179921.30	377130.40	45918.16	6730554.00
2008	April	843	158555.20	90761.73	45918.16	627850.50
2008	May	817	177063.70	313712.20	45918.16	6730554.00
2008	June	871	158707.90	83618.00	45918.16	627850.50
2008	July	846	157780.10	85019.82	45918.16	627850.50
2008	September	862	171076.70	198014.90	45918.16	6730554.00
2008	October	854	163564.30	86713.89	45918.16	627850.50
2008	November	845	166215.70	215011.10	45918.16	6730554.00
2008	December	837	168268.20	84441.54	45918.16	627850.50

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population-weighted.

Table A13: Descriptive Statistics – Households' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2009	January	849	162396.10	194846.10	45918.16	6730554.00
2009	February	829	189092.00	441384.20	45918.16	6730554.00
2009	April	811	160445.10	91262.48	45918.16	627850.50
2009	May	830	161878.10	90313.12	45918.16	627850.50
2009	June	854	180193.20	286865.30	45918.16	6730554.00
2009	July	863	177583.40	246812.70	45918.16	6730554.00
2009	September	814	166778.40	90676.30	45918.16	627850.50
2009	October	824	173938.10	326532.20	45918.16	6730554.00
2009	November	837	178135.30	241452.20	45918.16	6730554.00
2009	December	809	169860.50	212108.70	45918.16	6730554.00
2010	January	819	174674.70	272652.30	45918.16	6730554.00
2010	February	885	160863.30	84577.59	45918.16	627850.50
2010	March	868	161601.20	85158.75	45918.16	627850.50
2010	April	856	179094.20	221923.60	45918.16	6730554.00
2010	May	859	168283.80	86434.05	45918.16	627850.50
2010	June	799	167929.20	97783.02	45918.16	627850.50
2010	July	847	170139.50	92710.74	45918.16	627850.50
2010	September	828	170953.10	88023.02	45918.16	627850.50
2010	October	834	169022.80	89051.57	45918.16	627850.50
2010	November	854	173476.40	91208.61	45918.16	627850.50
2011	January	637	182628.10	374251.00	45918.16	6730554.00
2011	February	826	158773.30	83957.86	45918.16	627850.50
2011	March	837	186978.50	383982.30	45918.16	6730554.00
2011	April	811	165622.00	89203.90	45918.16	627850.50
2011	May	795	166226.20	95225.45	45918.16	627850.50
2011	June	817	160830.00	86039.87	45918.16	627850.50
2011	July	881	171277.30	96152.10	45918.16	627850.50
2011	September	815	169093.10	98644.64	45918.16	627850.50
2011	October	829	170167.10	201580.10	45918.16	6730554.00
2011	November	814	162870.20	84089.36	45918.16	627850.50
2011	December	816	166074.90	87787.47	45918.16	627850.50
2012	January	792	162204.40	87292.30	45918.16	627850.50
2012	February	783	167639.00	91430.93	45918.16	627850.50
2012	March	791	165910.40	89350.03	45918.16	627850.50
2012	April	818	195004.50	412530.90	45918.16	6730554.00
2012	May	780	171247.80	87924.75	45918.16	627850.50
2012	June	784	168072.50	88054.29	45918.16	627850.50
2012	July	819	174155.80	88588.54	45918.16	627850.50
2012	September	796	169457.40	91558.34	45918.16	627850.50
2012	October	827	174614.30	252549.20	45918.16	6730554.00
2012	November	808	164060.00	98695.27	45918.16	627850.50
2012	December	791	164582.10	88378.79	45918.16	627850.50

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population-weighted.

Table A14: Descriptive Statistics – Households' Net Monthly Income

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
2013	January	809	176305.10	213982.70	45918.16	6730554.00
2013	February	808	186802.70	334062.60	45918.16	6730554.00
2013	March	738	170330.90	95633.55	45918.16	627850.50
2013	April	786	184408.30	100928.50	45918.16	627850.50
2013	May	768	191535.40	214188.20	45918.16	6730554.00
2013	June	762	181013.00	92694.41	45918.16	627850.50
2013	July	841	188697.60	249917.40	45918.16	6730554.00
2013	October	815	202300.50	256445.20	45918.16	6730554.00
2013	November	793	194429.80	106581.80	45918.16	627850.50
2013	December	765	208396.30	344503.60	45918.16	6730554.00
2014	January	844	199351.20	182372.60	45918.16	6730554.00
2014	February	787	192917.20	98627.17	45918.16	627850.50
2014	March	738	204039.10	262403.40	45918.16	6730554.00
2014	April	750	217934.10	422877.10	45918.16	6730554.00
2014	May	731	212758.80	311502.50	45918.16	6730554.00
2014	June	742	209650.30	241908.50	45918.16	6730554.00
2014	July	765	194655.40	98114.27	45918.16	627850.50
2014	September	672	188701.40	93817.82	45918.16	627850.50
2014	October	773	192749.20	103164.70	45918.16	627850.50
2014	November	686	192091.50	100160.70	45918.16	627850.50
2015	January	771	190266.60	100986.90	45918.16	627850.50
2015	April	748	195105.80	104954.00	45918.16	627850.50
2015	July	728	199608.70	110622.40	45918.16	627850.50
2015	October	713	197964.50	115504.50	45918.16	627850.50
2016	January	701	201406.90	110464.50	45918.16	627850.50
2016	April	721	199499.10	108288.70	45918.16	627850.50
2016	July	699	336118.20	852993.60	45918.16	6730554.00
2016	October	706	300619.20	741836.90	45918.16	6730554.00
2017	January	720	253753.20	434656.80	45918.16	6730554.00
2017	April	706	218934.70	111551.50	45918.16	627850.50
2017	July	713	230579.10	249224.60	45918.16	6730554.00
2017	October	780	261839.10	446392.40	45918.16	6730554.00
2018	January	762	253277.30	443320.20	45918.16	6730554.00

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population-weighted.

C.3 Share of Individuals and Households with Available Data

Table A15: Share of Respondents with Data on Income – January Waves

Omnibusz Interview Year	Omnibusz Interview Month	Share of Respondents with Net Income Data	Share of Respondents with Income Category Data	Share of Respondents with Net Household Income Data	Share of Respondents with Household Income Category Data
2006	January	0.64	0.89	0.55	0.83
2007	January	0.67	0.91	0.60	0.87
2008	January	0.65	0.92	0.61	0.90
2009	January	0.61	0.87	0.57	0.85
2010	January	0.59	0.86	0.55	0.81
2011	January	0.24	0.70	0.22	0.63
2012	January	0.55	0.85	0.49	0.79
2013	January	0.52	0.82	0.49	0.80
2014	January	0.52	0.87	0.47	0.84
2015	January	0.51	0.79	0.47	0.77
2016	January	0.57	0.73	0.54	0.70
2017	January	0.55	0.72	0.56	0.72
2018	January	0.46	0.75	0.44	0.75

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Summary statistics for January waves of each years are presented in the table.

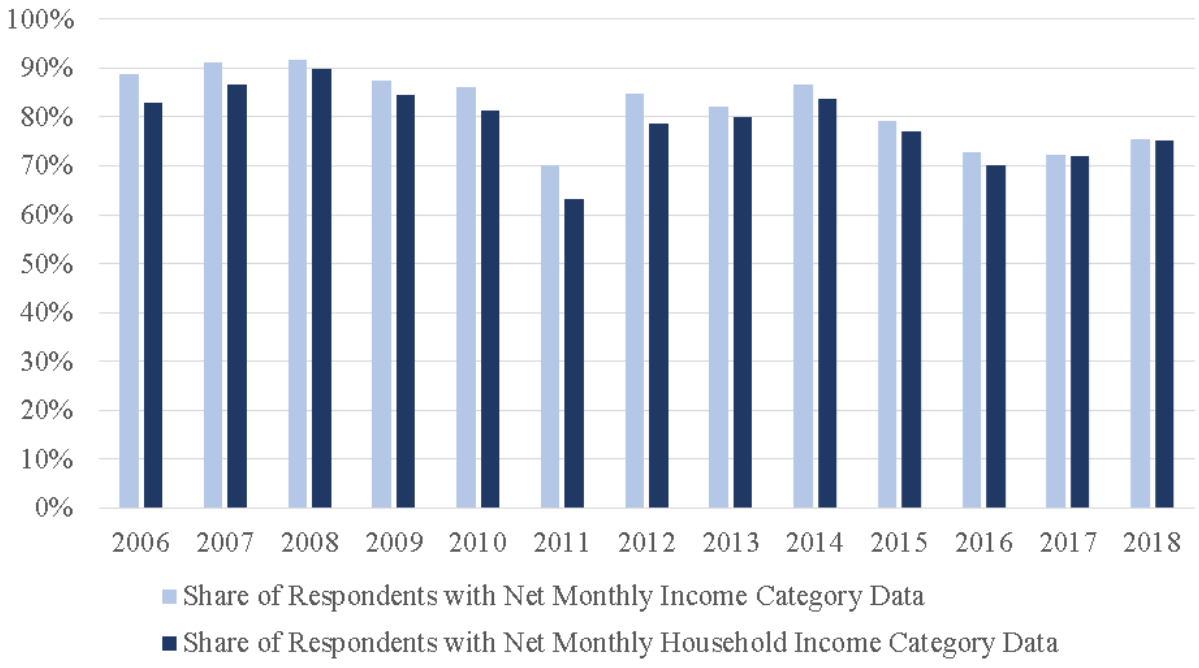

Figure A1: Share of Respondents with Income Category Data and with Household Income Category Data (January Waves)

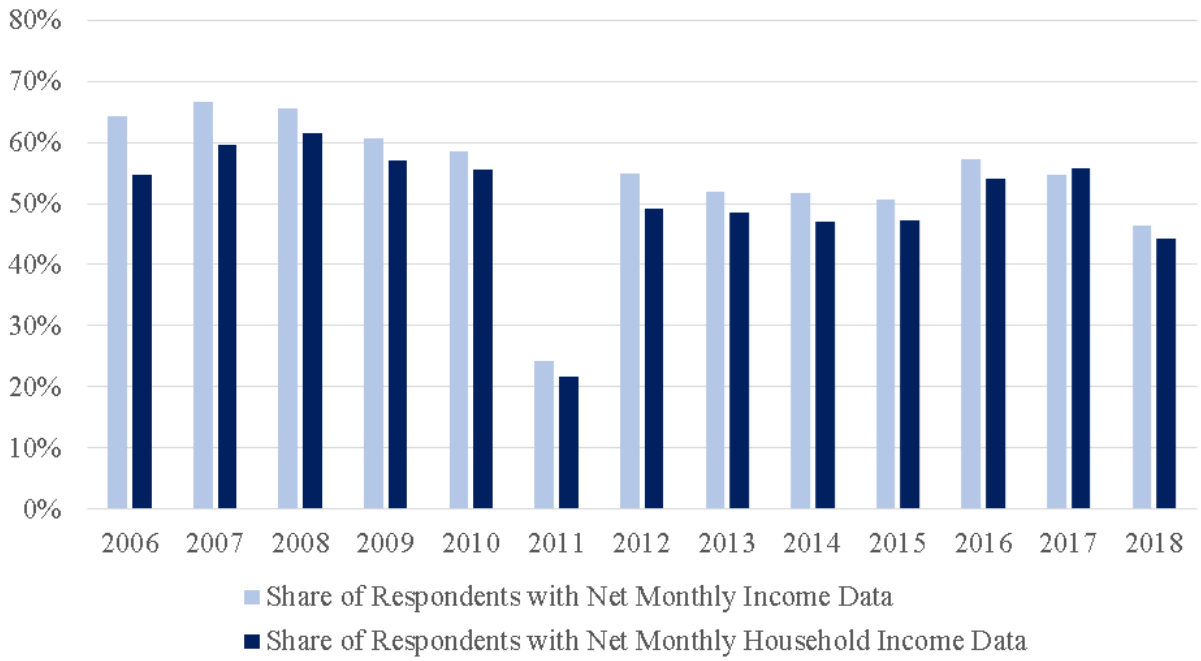

Figure A2: Share of Respondents with Exact Income Data and with Exact Household Income Data (January Waves)

D Appendix: Individuals Assessment of their Own Circumstances

Table A16: Descriptive Statistics – Individuals Assessment of their Own Financial Situation

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2006	January	1008	2.7515	0.7663
2006	February	1014	2.7456	0.7969
2006	March	1034	2.8834	0.7475
2006	July	1032	2.7004	0.7969
2007	January	1030	2.6176	0.7949
2007	June	1027	2.6440	0.7938
2007	September	1028	2.6549	0.7819
2007	December	1025	2.6365	0.8016
2008	May	1006	2.6802	0.8233
2008	July	1005	2.7517	0.7351
2008	October	1008	2.5265	0.8176
2009	January	1003	2.4980	0.7673
2009	April	1004	2.5643	0.7959
2009	July	1007	2.5016	0.8616
2009	October	1008	2.4512	0.8273
2010	January	964	2.4724	0.7759
2010	April	1011	2.5133	0.8282
2010	July	999	2.5930	0.8090
2010	October	1007	2.5458	0.8099

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "How do you asses your own financial situation at the moment?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

Table A17: Descriptive Statistics – Individuals Assessment of their Own Financial Situation

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2011	January	1008	2.5181	0.8218
2011	April	1003	2.5023	0.8439
2011	July	1006	2.4945	0.8265
2011	October	1000	2.5743	0.7766
2012	January	1007	2.3454	0.8048
2012	April	1004	2.4443	0.8272
2012	July	991	2.4508	0.8125
2013	January	1007	2.4440	0.7990
2013	April	999	2.5379	0.8421
2013	July	993	2.6507	0.8259
2013	October	984	2.6859	0.8533
2014	February	1001	2.6847	0.8176
2014	July	994	2.7619	0.8222
2014	October	993	2.7714	0.8731
2015	July	998	2.7996	0.8464
2015	October	999	2.9119	0.7690
2016	January	995	2.9017	0.8383
2016	April	990	2.9128	0.8207
2016	July	991	2.8983	0.8464
2016	October	994	2.9359	0.8509

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "How do you asses your own financial situation at the moment?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

E Appendix: Individuals Assessment on the National Economy

Table A18: Descriptive Statistics – Individuals Assessment on the National Economy

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2006	January	969	2.5511	0.7497
2006	February	983	2.5213	0.7915
2006	March	995	2.5914	0.7797
2006	July	999	2.1844	0.8018
2007	January	994	2.1483	0.7525
2007	June	1017	2.2223	0.7200
2007	September	1004	2.0970	0.7453
2007	December	1015	2.1249	0.7055
2008	May	1000	2.0830	0.7363
2008	July	981	2.1396	0.7522
2008	October	991	2.0140	0.7428
2009	January	1000	1.8945	0.6520
2009	April	999	1.7700	0.6338
2009	July	1003	1.8187	0.7090
2009	October	998	1.9057	0.6877
2010	January	957	2.2653	0.8046
2010	April	1008	1.9450	0.7154
2010	July	988	2.1407	0.6899
2010	October	999	2.1546	0.6885
2011	January	991	2.0788	0.7144
2011	April	994	2.0253	0.6740
2011	July	1001	2.1196	0.6956
2011	October	987	2.0494	0.6863
2012	January	994	1.8488	0.6805
2012	April	997	2.0161	0.6714
2012	July	982	2.0632	0.6983

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "How do you asses the country's economic situation at the moment?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

Table A19: Descriptive Statistics – Individuals Assessment on the National Economy

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2013	January	995	2.1166	0.7025
2013	April	988	2.2716	0.7364
2013	July	995	2.4130	0.7674
2013	October	965	2.4339	0.7975
2014	January	983	2.5981	0.7874
2014	February	969	2.5677	0.8508
2014	March	983	2.5390	0.8088
2014	April	972	2.6163	0.7864
2014	May	980	2.6579	0.8261
2014	July	980	2.5560	0.7577
2014	October	980	2.6514	0.8385
2015	July	989	2.6132	0.8183
2015	October	988	2.7658	0.7820
2016	January	990	2.8086	0.8053
2016	April	983	2.8226	0.7920
2016	July	989	2.7284	0.8248
2016	October	974	2.7901	0.8101

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "How do you asses the country's economic situation at the moment?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

F Appendix: Individual's Assessment on Whether the General Situation Follows a Generally Good or Bad Direction

Table A20: Descriptive Statistics – Individuals Assessment on Whether the Economy Follows a Generally Good or Bad Direction

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2009	November	999	1.9990	0.8586
2009	December	998	2.0545	0.8017
2010	January	1005	1.9481	0.8359
2010	February	995	1.9777	0.9267
2010	March	997	1.8562	0.8894
2010	April	995	2.2933	0.9459
2010	May	976	2.5189	0.9218
2010	June	994	2.7972	0.9530
2010	July	976	2.7717	0.9063
2010	September	988	2.8745	0.8692
2010	October	984	2.9451	0.8839
2010	November	992	3.0020	0.9230
2011	January	984	2.7671	0.9787
2011	February	973	2.7291	0.9915
2011	March	988	2.5247	0.9479
2011	April	996	2.5357	0.9769
2011	May	994	2.5284	0.9729
2011	June	994	2.5674	0.9674
2011	July	1002	2.5497	0.9602
2011	September	984	2.3537	0.9812
2011	October	999	2.3089	0.8865
2011	November	997	2.2887	0.9069
2011	December	993	2.2359	0.8693
2012	January	1000	2.1100	0.9231
2012	February	987	2.2515	0.9379
2012	March	1004	2.3143	0.9496
2012	April	1004	2.1952	0.8790

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What do you think, is the general situation getting better or worse in Hungary?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

Table A21: Descriptive Statistics – Individuals Assessment on Whether the Economy Follows a Generally Good or Bad Direction

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2012	May	992	2.1528	0.8828
2012	June	998	2.1912	0.8959
2012	July	987	2.2247	0.8887
2012	September	990	2.1685	0.8872
2012	October	991	2.2170	0.8870
2012	November	998	2.2786	0.9452
2013	January	995	2.3451	0.9320
2013	February	988	2.4704	0.9431
2013	March	996	2.4193	0.9150
2013	April	996	2.5221	0.9490
2013	May	993	2.5094	0.9534
2013	June	992	2.6177	0.9667
2013	July	995	2.5743	0.9574
2013	October	992	2.5653	0.9631
2013	November	987	2.7337	0.9691
2013	December	983	2.7489	0.9627
2014	January	996	2.7080	0.9279
2014	February	978	2.7918	1.1023
2014	March	987	2.8415	1.0026
2014	April	984	2.8504	0.9812
2014	May	987	2.8537	1.0168
2014	June	987	2.9040	0.9585
2014	July	993	2.7938	0.9801
2014	September	976	2.7102	0.9882
2014	October	993	2.7913	0.9837
2014	November	986	2.4860	0.9984
2015	January	989	2.3909	0.9642
2015	April	981	2.6151	0.9561
2015	July	985	2.7251	0.9379
2015	October	987	2.9331	0.9615
2016	January	993	2.9142	0.9698
2017	January	993	3.0987	0.9269
2017	April	992	2.9194	1.0050
2017	July	991	3.0424	1.1495
2017	October	1003	3.1783	0.9741
2018	January	1005	3.2635	1.0282

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What do you think, is the general situation getting better or worse in Hungary?". It is a categorical variable ranging from 1 (very bad) to 5 (very good).

G Appendix: Individual's 12-month Financial Expectations

Table A22: Descriptive Statistics – Individual's 12-month Financial Expectations

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2006	January	926	2.9654	0.7165
2006	February	946	3.0729	0.6916
2006	March	940	3.1660	0.6970
2006	July	978	2.4499	0.8367
2007	January	969	2.4644	0.8690
2007	June	958	2.6420	0.8687
2007	September	944	2.5328	0.8634
2007	December	944	2.5530	0.8285
2008	May	963	2.6708	0.8810
2008	July	969	2.7049	0.8305
2008	October	969	2.5170	0.8755
2009	January	968	2.3791	0.8210
2009	April	969	2.4293	0.8633
2009	July	967	2.5936	0.8641
2009	October	973	2.7492	0.8381
2009	November	967	2.6163	0.9058
2009	December	987	2.6120	0.9395
2010	January	981	2.6820	0.9229
2010	February	978	2.9192	0.8695
2010	March	982	2.9878	0.8684
2010	April	970	3.0907	0.7507
2010	May	971	3.0268	0.8194
2010	June	955	3.0942	0.8452
2010	July	963	2.9740	0.7913
2010	September	970	2.8515	0.8467
2010	October	960	2.9688	0.7676
2010	November	968	2.9618	0.8158
2011	January	960	2.8531	0.8385
2011	February	939	2.6901	0.9479

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your own financial expectation for the next a year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

Table A23: Descriptive Statistics – Individual's 12-month Financial Expectations

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2011	March	948	2.5232	0.9477
2011	April	967	2.6587	0.8249
2011	May	964	2.5975	0.9022
2011	June	971	2.6262	0.8527
2011	July	967	2.7301	0.7976
2011	September	953	2.3935	0.8978
2011	October	966	2.5745	0.7833
2011	November	940	2.3521	0.8488
2011	December	950	2.2137	0.8487
2012	January	950	2.4137	0.8468
2012	February	949	2.3656	0.9141
2012	March	983	2.4832	0.8771
2012	April	968	2.5124	0.8071
2012	May	950	2.2758	0.8550
2012	June	945	2.4021	0.9361
2012	July	958	2.5251	0.8107
2012	September	948	2.2521	0.9377
2012	October	961	2.5078	0.8368
2012	November	985	2.3310	0.9040
2013	January	966	2.6915	0.8432
2013	February	938	2.6269	0.9132
2013	March	955	2.6461	0.8653
2013	April	932	2.7682	0.8291
2013	May	943	2.7413	0.8940
2013	June	960	2.7823	0.8817
2013	July	964	2.8330	0.7708
2013	October	929	2.8558	0.7759
2013	November	926	2.9579	0.8519
2013	December	946	2.9271	0.8281

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your own financial expectation for the next a year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

Table A24: Descriptive Statistics – Individual's 12-month Financial Expectations

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2014	January	945	2.9344	0.8038
2014	February	888	3.0777	0.8181
2014	March	932	2.9442	0.8049
2014	April	955	2.9277	0.7565
2014	May	961	2.9116	0.8020
2014	June	953	2.8825	0.8153
2014	July	962	2.8950	0.7373
2014	September	944	2.8475	0.8665
2014	October	954	2.8774	0.8263
2014	November	931	2.6466	0.8803
2015	January	938	2.7090	0.8339
2015	April	963	2.8889	0.6938
2015	July	945	2.9513	0.6122
2015	October	927	3.0183	0.6171
2016	January	953	3.0241	0.6802
2016	April	937	3.0961	0.6725
2016	July	935	3.0599	0.6467
2016	October	959	3.1105	0.5889
2017	January	972	3.1564	0.6241
2017	April	961	3.0676	0.6280
2017	July	968	3.1312	0.5827
2017	October	988	3.2206	0.6005
2018	January	974	3.2033	0.6181

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your own financial expectation for the next a year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

H Appendix: Individual's 12-month Expectations for the National Economy

Table A25: Descriptive Statistics – Individual's 12-month Expectations for the National Economy

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2006	January	905	3.0906	0.7245
2006	February	895	3.1341	0.6902
2006	March	887	3.2368	0.7176
2006	July	960	2.4500	0.9566
2007	January	962	2.4886	0.9669
2007	June	951	2.6383	0.9105
2007	September	942	2.4299	0.9168
2007	December	943	2.4337	0.8932
2008	May	959	2.5641	0.8835
2008	July	950	2.5958	0.9311
2008	October	952	2.4044	0.8947
2009	January	974	2.2238	0.8693
2009	April	966	2.3126	0.9591
2009	July	969	2.5965	0.9166
2009	October	964	2.8039	0.8682
2009	November	946	2.5581	0.9447
2009	December	969	2.5655	0.9621
2010	January	967	2.7073	0.9293
2010	February	980	3.0163	0.9050
2010	March	982	3.1354	0.8208
2010	April	965	3.2021	0.8082
2010	May	965	3.1161	0.8078
2010	June	949	3.1855	0.8564
2010	July	957	3.0334	0.8440
2010	September	967	2.9452	0.8777
2010	October	953	3.1207	0.8012
2010	November	962	3.1019	0.8474

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your expectation for the national economy for the next year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

Table A26: Descriptive Statistics – Individual's 12-month Expectations for the National Economy

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2011	January	949	2.9642	0.8756
2011	February	945	2.7164	0.9589
2011	March	949	2.5469	0.9674
2011	April	968	2.6808	0.8714
2011	May	953	2.6023	0.9395
2011	June	959	2.6569	0.9036
2011	July	964	2.7656	0.8936
2011	September	966	2.3271	0.9311
2011	October	946	2.5116	0.8803
2011	November	947	2.2746	0.9153
2011	December	950	2.1537	0.8864
2012	January	940	2.3830	0.9582
2012	February	942	2.2760	0.9528
2012	March	978	2.4530	0.9197
2012	April	972	2.4619	0.8716
2012	May	955	2.2471	0.9017
2012	June	953	2.3158	0.9570
2012	July	958	2.5021	0.9094
2012	September	946	2.1660	0.9534
2012	October	956	2.4833	0.8902
2012	November	980	2.2796	0.9260
2013	January	966	2.6584	0.8776
2013	February	943	2.5992	0.9435
2013	March	955	2.6094	0.9447
2013	April	934	2.7537	0.9069
2013	May	922	2.7234	0.9507
2013	June	952	2.8004	0.9195
2013	July	970	2.8804	0.8775
2013	October	921	2.8654	0.8529
2013	November	914	2.9694	0.8838
2013	December	929	2.9957	0.8710

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your expectation for the national economy for the next year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

Table A27: Descriptive Statistics – Individual's 12-month Expectations for the National Economy

Omnibusz Interview Year	Omnibusz Interview Month	Number of Observations	Mean	Standard Deviation
2014	January	946	3.0222	0.8194
2014	February	869	3.1577	0.8583
2014	March	903	3.0454	0.8483
2014	April	939	2.9617	0.8238
2014	May	948	3.0021	0.8585
2014	June	953	2.8951	0.8790
2014	July	950	2.9463	0.8316
2014	September	928	2.8308	0.9152
2014	October	956	2.9592	0.9057
2014	November	921	2.6037	0.9580
2015	January	927	2.6170	0.8726
2015	April	963	2.8847	0.8107
2015	July	965	2.9130	0.7761
2015	October	933	2.9764	0.7594
2016	January	962	3.0166	0.7550
2016	April	947	3.0739	0.7377
2016	July	948	3.0074	0.7445
2016	October	939	3.0490	0.6800
2017	January	966	3.1739	0.6880
2017	April	949	3.0558	0.7292
2017	July	964	3.1732	0.7046
2017	October	972	3.2366	0.7230
2018	January	949	3.3045	0.6836

Note: Omnibusz survey is designed at individual level, there are 108442 observations between January, 2006 and January 2018. Means are population weighted. Data is drawn from the survey question of "What is your expectation for the national economy for the next year?". It is a categorical variable ranging from 1 (much worse than today) to 5 (much better than today).

I Appendix: Additional Regression Results

I.1 The Impact of Income, Perceptions and Expectations on the Vote Share of the Incumbent Party – 2006 and 2010

Table A28: Vote Share for Fidesz and for the Opposition by Survey Waves

	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ	Vote share for MSZP–SZDSZ
21,000 HUF – 40,000 HUF	0.019			0.012
	(0.024)			(0.025)
41,000 – 70,000 HUF	0.030			0.035
	(0.022)			(0.024)
71,000 – 100,000 HUF	0.033			0.048**
	(0.022)			(0.024)
101,000 – 150,000HUF	0.061***			0.076***
	(0.024)			(0.025)
151,000 – 200,000 HUF	-0.007			0.015
	(0.030)			(0.031)
201,000 – 300,000 HUF	0.031			0.040
	(0.043)			(0.042)
201,000 – 300,000 HUF	0.038			0.069
	(0.076)			(0.071)
500,000 HUF or more	0.091			0.075
	(0.116)			(0.126)
Perception on own financial situation – Bad	0.026**			-0.012
	(0.011)			(0.012)
Perception on own financial situation – Neither Bad nor good	0.137***			0.011
	(0.011)			(0.013)
Perception on own financial situation – Good	0.244***			0.019
	(0.018)			(0.019)
Perception on own financial situation – Very good	0.109			-0.004
	(0.082)			(0.071)
Perception on the national economy	No	Yes	No	Yes
Own financial expectations	No	No	Yes	Yes
Expectations for the National Economy	No	No	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	13,327	14,930	16,466	12,053

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The income categories are listed in Appendix C, the reference category is the 20,000 HUF or less income category. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

I.2 The Impact of Income, Perceptions and Expectations on the Vote Share of the Incumbent Party – 2010 and 2014

Table A29: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2010 and 2014

	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz
61,000–90,000 HUF	-0.003			-0.008
	(0.021)			(0.021)
91,000–120,000 HUF	0.027			0.015
	(0.021)			(0.021)
121,000–150,000 HUF	0.032			0.019
	(0.021)			(0.021)
151,000–200,000 HUF	-0.003			-0.021
	(0.020)			(0.020)
201,000–300,000 HUF	0.019			-0.013
	(0.021)			(0.021)
301,000–500,000 HUF	-0.005			-0.027
	(0.025)			(0.025)
501,000–1,000,000 HUF	-0.002			-0.028
	(0.068)			(0.056)
1,000,000 HUF or more	0.133			-0.015
	(0.181)			(0.150)
Perception on own financial situation – Bad	0.016			-0.033**
	(0.014)			(0.016)
Perception on own financial situation – Neither Bad nor good	0.180***			0.050***
	(0.015)			(0.017)
Perception on own financial situation – Good	0.273***			0.054**
	(0.023)			(0.025)
Perception on own financial situation – Very good	-0.004			-0.126**
	(0.067)			(0.064)
Perception on the national economy	No	Yes	No	Yes
Own financial expectations	No	No	Yes	Yes
Expectations for the National Economy	No	No	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	9,942	13,121	33,369	9,198

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2010 and January 2014. February, March and April 2010 waves are not included due to changes in survey methodology. The income categories are listed in Appendix C, the reference category is the 60,000 HUF or less income category. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

I.3 The Impact of Income, Perceptions and Expectations on the Vote Share of the Incumbent Party – 2014 and 2018

Table A30: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2014 and 2018

	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz	Vote share for Fidesz
61,000–90,000 HUF	-0.049			0.006
	(0.034)			(0.035)
91,000–120,000 HUF	-0.032			0.004
	(0.034)			(0.034)
121,000–150,000 HUF	-0.018			0.018
	(0.034)			(0.034)
151,000–200,000 HUF	-0.036			0.003
	(0.033)			(0.033)
201,000–300,000 HUF	-0.047			-0.014
	(0.033)			(0.032)
301,000–500,000 HUF	-0.045			-0.013
	(0.035)			(0.034)
501,000–1,000,000 HUF	-0.043			0.002
	(0.055)			(0.048)
1,000,000 HUF or more	0.191**			0.090
	(0.090)			(0.077)
Perception on the national economy	No	Yes	No	Yes
Own financial expectations	No	No	Yes	Yes
Expectations for the National Economy	No	No	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	9,942	13,121	33,369	9,198

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2014 and January 2018. The income categories are listed in Appendix C, the reference category is the 60,000 HUF or less income category. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.

Table A31: The Impact of Economic Voting Variables on Incumbent Party Vote Share in Hungary between 2014 and 2018

	Jan 2011–Dec 2012	Jan 2013–Feb 2014	May 2014 – July 2015
Utility Bills	0.002	-0.051***	-0.017
	(0.015)	(0.020)	(0.027)
Sociotropic variables	Yes	Yes	Yes
Pocketbook variables	Yes	Yes	Yes
Retrospective variables	Yes	Yes	Yes
Prospective variables	Yes	Yes	Yes
Observations	4,860	2,784	2,024
R-squared	0.141	0.301	0.303

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Omnibusz survey is designed at individual level. The table includes waves between May 2014 and January 2018. For the perception, the base categories are always the value of 1 that is the *very bad* category. For the expectation variables, the base categories are always the value of 1 that is the *much worse than expected* category. Regression results are population weighted. Additional control variables include the respondent's gender and education level. Robust standard errors are used.