Partisan Budget Cycles and Electoral Accountability in the European Union using Household Tax Rates, 1996-2016

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Abstract

There is good evidence that prior to a general election the government will seek to increase its chance of being re-elected by lowering taxes or by increasing public expenditure, leading to a politically-motivated cycle in fiscal policy. A potential difficulty with this literature is that few existing studies consider the actual income tax paid by different household types. This thesis uses the net Personal Average Tax Rate (PATR) for 13 different households (by marital status, family size and income) to examine the political budget cycle for 26 European Union countries. It considers the effect of the PATR on the government vote share to analyse the effect of fiscal manipulations and electoral accountability. The data are collected for political and socio-economic variables over 1996-2016, giving 143 observations on general elections. This is regressed using techniques such as the Generalized Method of Moments and Quasi-Maximum Likelihood estimators. The thesis makes three main contributions.

First, the thesis finds that there is opportunistic behaviour by all parties across the EU as both right- and left-wing parties lower the PATR in the run-up to an election, but focusing on married-coupled households with two children. Second, it finds that left-wing parties are rewarded for lower income taxes prior to an election, which is for both for married-couple and single households. However, on differentiating between the older democracies of the European Union and the Central and Eastern European countries, only the right- [left] wing parties are rewarded for an election-year cut in the PATRs in the former [latter] countries. Overall, the thesis finds that a left-wing party is rewarded for opportunistic behaviour. Finally, by analysing consecutive elections that are won by the same party, the thesis finds there is a smaller effect of PATRs on votes in the second electoral term, and this supports rational voter behaviour.

Dedication

I dedicate this thesis to my parents, Suttyhudeo and Indumuttee, and to my sister, Rajlukshmee, who have been waiting patiently for this moment, and for their continuous encouragement.

Acknowledgement

Firstly, I would like to thank my parents. I would not have been in this privileged position without them. Their love, kindness and support have given me the opportunity to fulfil my dreams. A heartfelt thank you to my sister, who has always motivated me to get out of my comfort zone and the continuous encouragement at all times.

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Chapter 1. Introduction

1.1 Motivation

The political business cycle theory explores the opportunistic behaviour of governments that seek to stimulate the economy to improve their re-election chances. It is important, since such behaviour potentially has a major impact on economic activity. In his seminal work, Downs (1957) indicates that the main objective of political parties is to formulate policies to gain office, although there is no sense of a how a government in office will behave to stay in office, such as through the manipulation of the macroeconomy. It was not until the work of Nordhaus (1975) and Tufte (1978) that this possibility was considered. In the Nordhaus (1975) model, it is assumed that the voters have adaptive expectations, and by exploiting the Phillips Curve the incumbent creates an 'inflation surprise', which pushes down unemployment in the run-up to an election. It is this that the voters focus on and reward the incumbent for at election time, but of course it has implications for the path of the macroeconomy. Related to this, Hibbs (1977) considers the possibility that political parties have different ideologies and choose their policies accordingly. This is unlike the Nordhaus model, where the incumbents are apolitical and behave the same in office, and where opportunistic governments focus solely on their own electoral motives. Hibbs argues that a right-wing party focuses on decreasing the inflation rate and a left-wing party focuses on unemployment. As such, economic policies vary according to the party in power and not because the incumbent manipulates the economy.

The next generation of scholars assumed that voters have rational expectations, but that there is an information asymmetry between the government and voters, enabling the incumbent to again engage in politically-motivated behaviour (Rogoff and Sibert, 1988). The idea is that the voters observe the outcomes of policy with a lag, but do not observe the competence of the incumbent (i.e., an information asymmetry). In the run-up to an election the incumbent takes advantage of this to implement expansionary fiscal policies. Rogoff and Sibert shift the focus from the analysis of macroeconomic outcomes to fiscal instruments, and the effect of elections on these is known as the 'political budget cycle'. The notion of rational voters is also applied to the Hibbs-type model, leading to the 'rational partisan theory'. It is associated with Alesina (1987), in which voters are rational but parties have different policy preferences.

A large literature exists on the political economy of fiscal policies, namely government spending (Kneebone and McKenzie, 2001; Block, 2002; Drazen and Eslava, 2010; Katsimi and Sarantides, 2012), budget deficits (Mink and de Haan, 2006; Shi and Svensson, 2006) and

taxation (Pettersson-Lidbom, 2003; Ehrhart, 2013; David and Formanová, 2016). Empirical studies focus on various settings including both developed and developing countries. These find evidence of the electoral cycles in the developing countries, where democracy is relatively new, but there is mixed evidence for electoral cycles in more-developed countries. In the case of the European Union (EU) member states, some studies fail to find evidence of an electoral cycle in fiscal instruments (Andrikopoulos *et al*., 2004; Donahue and Warin, 2007), but other studies find good support (Buti and Van den Noord, 2004; Mink and de Haan, 2006).

Overall the majority of the existing studies focus on government spending and budget deficits, but the evidence for the effect of election on taxation is much more limited. This is of concern as taxes feature prominently in election campaigns in different countries, suggesting that they are important, while Haselswerdt and Bartels (2015) find that citizens react to tax breaks as compared to government spending. A possible explanation for this is that changes in taxes affect the disposable income much more directly. A further deficiency of the existing literature is that much of the evidence for taxation focuses on the overall tax revenue, such as the total taxation collection relative to Gross Domestic Product. However, there are many factors that influence the tax collection, such as the level of economic activity, so that it may change without any change in the tax rates. This thesis contributes to the literature by focusing on the relationship between elections and income taxation. To capture the direct effect of taxes it examines the effective tax rate, which measures the actual tax burden, and for different behavioural responses it measures the effective tax rate for different household types, which is by marital status, family size and income. Fortunately, data are available for the effective tax rate for the different household groups for the EU member states over a long time period.

In addition to the electoral effect on the effective income tax rate, the thesis examines the partisan electoral effects. Incumbent governments have different ideologies, that is, they are either a right-wing or left-wing party, leading to different policy preferences. For instance, it is known that a right-wing party gives priority to tax reductions, while a left-wing party puts more emphasis on government spending and is willing to accept higher taxes (Allers *et al.*, 2001). Given that these ideological preferences differ between parties, and that parties might target particular household types then the thesis examines if, in the run-up to an election, a party abides by its ideology or engages in opportunistic behaviour to win votes.

As a further issue, an incumbent government engages in the electoral manipulations of fiscal policies in an attempt to influence voters on its side and to increase its re-election chance. In so doing, the incumbent has to believe that it will be rewarded by the electorate with higher votes from beneficial changes in the economy, and punished for adverse changes, so there is 'electoral accountability'. While there are many studies that examine electoral cycles, there is

a complementary literature that focuses on the electoral accountability. Goodhart and Bhansali (1970) and Kramer (1971) are among the first such studies to examine if voting behaviour is determined by the economic performance in a country. The premise is that voters evaluate the economic situation based on the growth rate of macroeconomic variables, and that they reward the incumbent for improvements. Clearly, if there is no link between voting and the economy then we might doubt the existence of the political business cycle.

The literature on electoral accountability and taxation investigates voting behaviour by incorporating 'yardstick competition', focusing on elections within a country at the national or regional level (Besley and Case, 1995; Bosch and Solé-Ollé, 2007; Dubois and Paty, 2010). Yardstick competition means the voters compare their own tax rates with those of neighbouring jurisdictions when deciding to reward or punish the incumbent. It implies that incumbents set taxes with respect to that of neighbouring areas to increase their re-election chances. However, a limitation of yardstick competition is that the electorates adopt a comparative voting behaviour and compare the performance of the incumbent in their own area to that of the neighbouring area. Although there have been several research studies on electoral accountability and taxation focusing on yardstick competition, there is limited evidence with regards to retrospective voting and electoral accountability using general elections and cross-country analysis (Tillman and Park, 2009). Retrospective voting implies that the electorates evaluate the performance of the incumbent when making their voting decision. As such, one of the contributions of this thesis is to investigate the effects of changes in taxation on the vote share of the incumbent at an EU level across member states. According to Ferejohn (1986), voters punish the incumbent for a poor performance through retrospective voting. It is, therefore, essential to investigate the effect of taxation on the vote share of the incumbent government based on this.

An important issue regarding electoral accountability and retrospective voting is whether voters are able to learn from the previous electoral manipulations of an incumbent government. If they do learn, the political budget cycle might lose credibility if the incumbent repeatedly manipulates the economy in the run-up to a general election. On the one hand, this matters if voters are rational and understand the economic model, in which case electoral manipulations will have no effect on votes. In this case, the voters have a long memory and take into account the performance of the incumbent government over a longer period, including the possibility that the electorate was 'fooled' by previous manipulations of the economy. On the other hand, if voters are myopic and evaluate the government based only on its recent performance, then the electorate has no memory and will reward the incumbent for its electoral manipulation. This issue is rarely explored in the literature, but the existence of a cross-country

dataset over many years means that it can be explored in this thesis by examining consecutive elections.

1.2 Aims of the Thesis

The focus of the thesis is on taxation, and specifically on the income tax rate that affects voters most directly. A key feature of the thesis is that it uses the effective income tax rate of different household types, which is referred to as the net Personal Average Tax Rate (PATR). This is available for thirteen household groups, which are differentiated by marital status, family size and income. The study is for the 26 EU member countries (the 'EU26') over the period 1996-2016. Fortunately, data on the PATRs are available for these. Using this the thesis makes three main research contributions, which are as follows.

The first contribution is to examine whether the government engages in electoral manipulations of the PATRs for the different household groups, and how does this vary by ideology. Usually political parties of different ideologies target different groups of voters and these effects may be under-estimated in the studies that look at overall tax revenue. Given that the PATRs are available for thirteen household groups, this thesis contributes to the existing literature by identifying which household groups are likely to be targeted by the incumbent government in the run-up to an election. It is therefore possible to test the electoral effect on the PATRs for the different household groups, which captures the opportunistic behaviour of the incumbent government. It is expected that in the run-up to an election an incumbent government, irrespective of ideology, will engage in expansionary fiscal policies in an attempt to increase the re-election chance. The first contribution also tests the partisan electoral effect. Usually, a right-wing government is assumed to put more emphasis on tax cuts and a left-wing party on public expenditure. Although a decrease in taxes by the right-wing party is said to be a partisan effect, electoral tax cuts by the left-wing party is said to be an opportunistic partisan behaviour. As such, both the right- and left-wing parties engage in electoral tax cuts in an attempt to increase their re-election chances. Notwithstanding this, partisan differences may still exist, since it is expected that a left-wing party will seek the support of more-disadvantaged groups (e.g., low-income, single-parent households), but that a right-wing party will seek other groups. This is a contribution and it can be explored since the net PATR is available for thirteen household groups. This part of the thesis is examined using the difference-Generalised Methods of Moments (GMM) estimator.

The second contribution involves examining the effect of changes in the net PATR for the different household groups on the vote share of the incumbent government. Given the

presence of either opportunistic or partisan electoral effects, it is possible to investigate if an election-year change in the net PATR affects the vote share of the incumbent. Since the PATRs are available for different household groups, a contribution lies in identifying an election-year change in the PATR for which household group has an effect on the vote share of the incumbent government. As such it is possible to understand which household groups respond to the electoral changes in the PATRs. Voters are likely to reward the incumbent government, but perhaps depending on whether the policy is in line with the incumbent's ideology (Tillman and Park, 2009). As such, since a right-wing party puts more emphasis on taxation compared to a left-wing party, it is expected that the voters reward a right-wing government for tax cuts as compared to a left-wing government. An increase [decrease] in the vote share of the incumbent government is interpreted as voters rewarding [punishing] the incumbent. Given that the EU consists of both newer and older democracies, it is possible to investigate the voting behaviour in the East and West EU. Since the dependent variable is the vote share of the incumbent, which is bounded between zero and one, this econometric analysis is carried out using a Quasi-Maximum Likelihood Estimator that allows for this.

Finally, the third contribution is to investigate whether the electoral manipulations in the net PATR are credible or not, which has implications for rational voter behaviour. This is achieved by focusing on the elections where an incumbent government wins consecutive elections. The analysis compares the effect of election-year changes in this tax variable on the vote share of the incumbent government between the first and second term. If the voters are rational and learn from pervious manipulations then it is expected that the effect on the vote share of the incumbent in the second electoral period is smaller compared to the first electoral period, and may even be statistically insignificant. Since the model is broadly the same to the second objective then the Quasi-Maximum Likelihood Estimator is used.

1.3 Nature of Data

The thesis uses the effective income tax rate as the fiscal instrument. This is the net PATR that is available from *Eurostat* at the country level for the EU. The net PATR captures the gross tax that individuals actually pay in each household and country, which includes social security contributions net of any cash benefits. It represents the actual proportion of an individual's income paid in tax. The methodology used to calculate the net PATR can be found in OECD (2016). The PATR data are collected for the EU26 member states (excluding Cyprus and Malta at 2016) and consist of ten Central and Eastern European countries (CEECs) and the sixteen countries that joined before 2004 (referred to as the 'West EU'). Although the presence of

electoral cycles in fiscal policies was thought to be common in less developed countries (Brender and Drazen, 2005), some studies such as Andrikopoulos *et al.* (2004) and Buti and Van den Noord (2004) examine the presence of electoral cycles in the EU. The EU therefore is of interest since it contains a mix of both newer and older democracies.

The PATRs are available for thirteen different household groups. Each group is defined by the marital status of the adult occupants, number of children and the average earnings. The thirteen different household groups can be divided into two broader groups according to single individuals and married couples. The PATRs are higher in the West EU as compared to the CEECs, but they tend to fluctuate more over time in the CEECs comparted to the West EU. The thesis uses panel data, which is annual data for the EU26 member countries over the period 1996-2016. In total, 143 general elections are observed, which is an average of one election every four years. A longer time period cannot be used since the PATR data are available from 1996 only. Information on each country's election dates is taken from the *Database of Political Institutions of the World Bank* and the *International Foundation for electoral Systems Election Guide*. The vote share of the incumbent government at election are taken from the *Inter-Parliamentary Union* (*IPU*) and the *Election Guide of the International Foundation for Electoral Systems* (*IFES*).

The explanatory variables used in this thesis can be classified into two groups; namely the political variables and the socio-economic variables. The political variables consist of the different government ideologies, where data from the *Database of Political Institutions (DPI)* of the Development Research Group of the World Bank is used to identify right- and left-wing parties. Data on socio-economic variables are taken from the *World Development Indicators* and *Eurostat*. All variables are at the country level, and the choice of the explanatory variables is based on the previous studies of the political budget cycle and electoral accountability.

1.4 Layout of Thesis

The body of the thesis is divided into six main chapters. I undertake the literature review on the theoretical and empirical perspectives of politically-motivated electoral cycles in Chapter 2. The different electoral systems of the EU26 countries are considered in Chapter 3. Chapter 4 discusses the empirical methodology and describes the variables used in the empirical work. Chapters 5 to 7 contain the main empirical analyses for each of the three research contributions outlined in Section 1.2. Chapter 8 concludes. I now provide more details on each of these.

Chapter 2 gives a formal definition of the political business cycle theory and it explains the different variants of the political business cycle that has developed throughout the years.

Following the discussion of the different frameworks, I review the empirical literature on the political business cycle theory from both theoretical and empirical perspectives. This review begins with the studies that focus on the presence of electoral cycles in the OECD and EU member countries, followed by that of the developing countries. Subsequently, I consider the literature on electoral accountability, that is, whether changes in fiscal policy at election time affect the re-election chances of the incumbent government. These are also discussed with respect to the OECD and EU member countries and the developing countries.

In Chapter 3, I describe the main types of electoral system that are used in the European Union. These are the majoritarian, proportional representation and mixed electoral systems. Usually, elections take place at a constitutionally fixed term, i.e., pre-determined, but sometimes an election takes place early. This chapter also considers the three main reasons why the elections are not pre-determined in the EU26 member countries, which are due to the self-interest of the incumbent, coalition collapse and stochastic events. It enables the thesis to differentiate 'pre-determined' and 'not pre-determined' elections from each other.

Chapter 4 outlines the methodology and variables used in this thesis. Panel data is used to analyse each of the three main aims of the thesis. The Least Squares Dummy Variable (LSDV) estimator is used to analyse the electoral effects and electoral accountability, but given its limitations, I also use the Generalised Methods of Moments (GMM) for the first research contribution and Quasi-Maximum Likelihood Estimator for the other two. Post-estimating the Quasi-Maximum Likelihood Estimator, the marginal effects are calculated. With regard to the third research contribution, a smaller sample is used that is based only on those elections where the same incumbent government (single party or coalitions) wins consecutive elections.

In Chapter 5, the first research contribution of this thesis is made, which is on the effect of elections on the net PATR. Using the difference-GMM estimator, a significant effect is found for only one of the thirteen household groups. This is married couples with two children, which is the most important in terms of its size and is likely to impact on the electoral outcome. There is evidence that both the right- and left-wing parties engage in electoral cuts of the tax variable for this household group, and since the left-wing party is known to emphasize higher public expenditure this suggests the opportunistic behaviour by the left-wing party. The chapter carries out some robustness tests of this central result. This includes an alternative measure of the election variable that takes into account the exact month in which the election is held. In addition, when attention is focused on pre-determined elections it is found that only the left-wing party engages in electoral PATR cuts, again indicating opportunistic behaviour. Since the share of households in each of the thirteen household groups varies across the EU26 member countries, the net PATRs are weighted according to this for each EU26 country to make them

representative. However, only the right-wing party is found to lower the PATR in the run-up to an election, which is for households consisting of single individuals with no children. The findings from weighting the PATRs are not as expected since the household groups consisting of married couples with two children make the most out of the thirteen household groups across the EU26 member countries, and the findings from the weighted PATRs indicate otherwise. As such, it is expected that the incumbent government is likely to target the group of voters, which is the majority of the population.

In Chapter 6, the effect of the net PATR on the vote share of the incumbent government is examined. The main analysis is conducted using the Quasi-Maximum Likelihood Estimator. It is found that the vote share of the incumbent left-wing party in office increases following an election-year decrease in the net PATR for the household groups of single individuals (with no and two children) and married couples with two children, but there is no evidence that the vote share of the right-wing party is affected. This is consistent with Chapter 5, where the results for opportunistic behaviour are stronger for the left-wing incumbent. Robustness is again explored for the pre-determined elections and by weighting the PATRs for each country by their share of the households. Similar results are obtained for the pre-determined elections, but for the weighted PATRs there is evidence that the vote share of the incumbent is lower as a result of an increase in the PATRs, irrespective of the government ideology. As part of the robustness tests, the effect of the net PATR on the vote share of the incumbent government is explored for the West EU and CEECs. In the West EU, the right-wing party is rewarded for an election-year decrease in the PATRs for the household groups of both single individuals and married couples, while there is no evidence that the vote share of the left-wing party is affected by election-year changes in the PATRs. However, the vote share of the left-wing party only is rewarded in the CEECs for the election-year change in the PATRs for household groups of both single individuals and married couples.

Chapter 7 examines the credibility of the electoral manipulations in the net PATRs, by focusing on the incumbent government's vote share where it wins consecutive elections only. The aim is to investigate whether the electorate rewards the incumbent for the position of the economy in the election year at the end of the second term, given that the incumbent may have already manipulated the economy at the end of the first term, and perhaps erroneously been rewarded by the electorate for its behaviour then. It is a test of whether the electorate is able to learn about the previous behaviour of the incumbent. The same variables and econometric techniques are used as in Chapter 6, but using the more restricted sample of elections. I find that voters are influenced by the electoral manipulations in the first electoral term, but that the effect of an election-year change in the tax variables in the second electoral term is significantly

smaller. It is consistent with rational voting behaviour, and suggests that voters learn from the post-election consequences of previous electoral manipulations.

Finally, Chapter 8 concludes. In this chapter I summarise the main findings in greater detail. I also put the findings into context and consider the limitations of the thesis.

Chapter 2. Literature Review

2.1 Introduction

It is argued that incumbent governments manipulate the economy in the run-up to a general election in order to be re-elected, but leading to a cycle in economic activity that is related to the pattern of elections (Nordhaus, 1975; Lindbeck, 1976). This is the political business cycle, and it can arise either in the policy outcomes of the key macroeconomic indicators such as the unemployment or inflation rate, or in the policy instruments such as taxes or government expenditure. Indeed, a political business cycle can occur even if a government does not intentionally manipulate the economy, but is related to the behaviour of economic agents from uncertainty about the outcome of an election. In either case, the political business cycle is a phenomenon that affects macroeconomic activity (Brender and Drazen, 2005).

The purpose of this chapter is to review the different theoretical models of the political business cycle, of which four basic model types can be identified. These are: the 'pure political business cycle' of Nordhaus (1975); the 'political budget cycle' of Rogoff and Sibert (1988); the 'partisan theory' of the political business cycle of Hibbs (1977) in both its strong and weak versions; and the 'rational partisan theory' of Alesina (1987). Under the first two of these there is opportunistic behaviour by the government. In the pure political business cycle voters have adaptive expectations, whereas under the rational version of Rogoff and Sibert the voters have rational expectations but are poorly informed, i.e., it is a model of asymmetric information. The focus of Nordhaus is on the outcomes of macroeconomic policy, but in Rogoff and Sibert the analysis shifts to consider the policy instruments, leading to a 'political budget cycle'.

In contrast to these, under the partisan theory the objective of a government is to enact its ideology, which in the strong version of this theory is the sole aim of the government (see Hibbs, 1977; Tufte, 1978). However, in the weak version, such as the 'satisficing model' of Frey and Schneider (1978a), the pure political business cycle and partisan model are combined, with the government switching its behaviour between ideological goals and opportunistic behaviour, but depending on how confident it is in winning the next election. This captures the opportunistic and ideological behaviour of a government, and it is the premise of the rational partisan model, but which incorporates rational expectations into the framework.

The models of the political business cycle predict that electoral manipulations occur in the economic outcomes and fiscal policies, but a complementary literature focuses on electoral

accountability, whereby the impact of fiscal policies on the incumbent government's re-election prospects is examined. The works of Goodhart and Bhansali (1970) and Kramer (1971) are based on the impact of economic variables on voting behaviour, with voters basing their voting decision on an evaluation of the inflation or unemployment rates. For instance, voters support the incumbent government if the national economy is performing well (Powell and Whitten, 1993). With regard to their voting decision, voters may compare their own fiscal instruments with that of neighbouring countries or jurisdictions, which is 'yardstick competition' (Besley and Case, 1995). In this chapter, I review the literature on the political business cycle, and on the impact of fiscal policy on the voting share of the incumbent government, where this includes studies that focus on taxation and yardstick competition.

The structure of the chapter is as follows. Section 2.2 focuses on the pure and partisan political business cycles, and Section 2.3 considers the political budget cycle and partisan theory. Section 2.4 reviews the empirical evidence on the main models, focusing on the pure model (Section 2.4.1) and on partisan models (Section 2.4.2). Section 2.5 reviews the empirical evidence on the political budget cycle, and whether government expenditure, taxation and budgets follow an electoral pattern. Section 2.6 reviews the empirical evidence on the impact of fiscal policies on the vote share of the incumbent government, and finally Section 2.7 concludes the chapter.

2.2 The Political Business Cycle

2.2.1 *The Pure Political Business Cycle*

Nordhaus (1975) offers one of the first generation of political business cycle models. In this model, as the election approaches, the incumbent government is interested in manipulating the economy in order to remain in power. To do this, the incumbent 'improves' social welfare in an opportunistic manner in order to influence voting and increase its chance of winning an election. The government's objective function that it manipulates is the social welfare function, which includes the voters' preference for low rates of unemployment and inflation. However, the maximisation of this function by the government is constrained by a Phillips Curve that gives a trade-off between the inflation rate and unemployment rate for the economy.

In the model of Nordhaus (1975), the government chooses economic policies to enhance its popularity at the next general election. To develop the opportunistic model of the political business cycle, Nordhaus makes simplifying assumptions. The model consists of a political system with just two parties, where the main interest of each party is to increase the 'political

profit' of re-election rather than its ideology. The date of the next election is fixed exogenously, and the welfare function of the electorate, which is known as the 'vote function', includes aggregate unemployment and inflation only, where voters prefer lower rates of each of these. The government is aware of the voters' preferences, so that this forms its objective function.

The electorate decides which of the two parties to vote for at the next election depending on how well the incumbent government has managed the economy during its term of office, so that what matters is the past performance of the incumbent. The model assumes that the voters have decaying memories, and that their memory lasts only as long as the electoral period, so that the electorate neither takes into account how well the incumbent has performed in any previous term of office, nor indeed the expected performance of the economy after the date of the next election. Further, the events that occur closer to the election date are more important for voters.

These assumptions are given effect in the Nordhaus model by an expectations-augmented short-run Phillips Curve that in effect defines the macroeconomic system. This Phillips Curve shows the trade-off between the unemployment and inflation rate, and it constrains the government's behaviour. However, crucially, the electorate is not aware of this relationship and hence the macroeconomic framework. The Phillips Curve embodies adaptive expectations, so that the electorate bases its predictions of about future inflation on the past inflation rate. Since the government can manipulate aggregate demand through fiscal and potentially monetary policies as well, then it is assumed that the incumbent can determine unemployment in the short-run according to a Phillips Curve relationship, but which has undesirable long-run consequences.

Given the assumption that the voters prefer lower inflation and unemployment rates, the aggregate vote function V_t at time t of the Nordhaus model is written as:

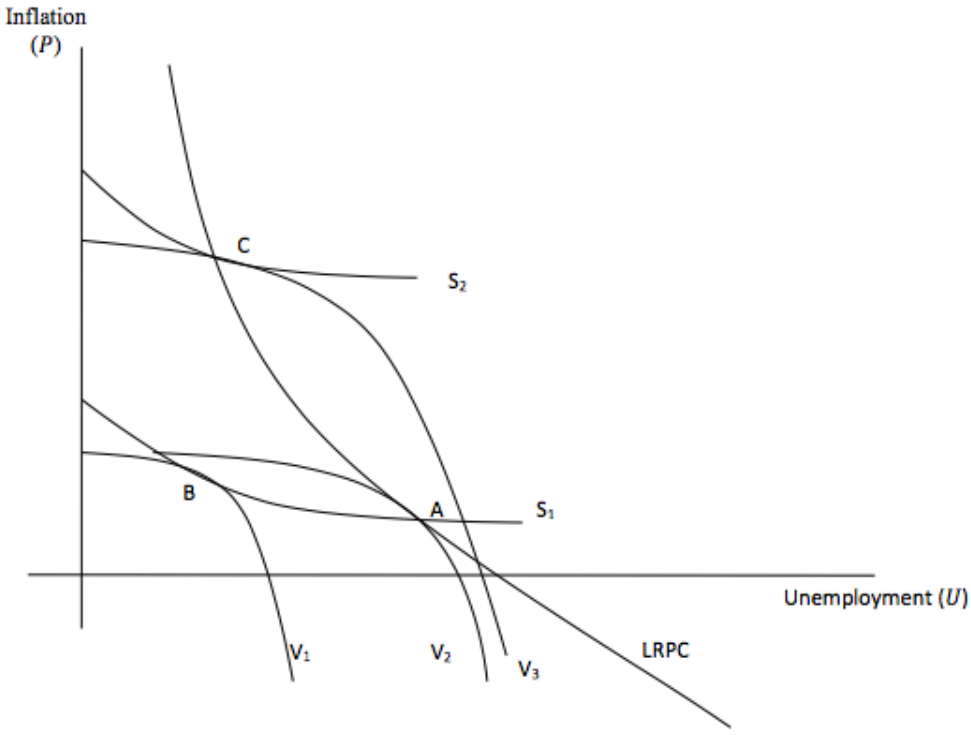
$$V_t = g(U_t, P_t), \qquad (2.1)$$

where U_t and P_t are the aggregate unemployment and inflation rates respectively. The vote function is a decreasing function of each of U_t and P_t, and it is represented by a set of iso-vote lines, where each line gives the combinations of the unemployment and inflation rate that give a constant level of votes for the incumbent at the next general election. Figure 2.1 illustrates the nature of the Nordhaus political business cycle. It shows the long-run Phillips Curve (LRPC) relationship, in which expected inflation equals actual inflation, but it also shows two short-term Phillips Curves of interest, S_1 and S_2, where these are a trade-off between the rates

of unemployment and inflation in the short-run. It also shows two relevant iso-vote lines, V_1 and V_2, where these are derived from the vote function *V* that is given in Equation (2.1).

Suppose the government is initially at position *A* in Figure 2.1, but facing the prospect of an election over the short-run. At this position, the economy will yield a level of votes given by the iso-vote line V_2, which is insufficient to win this election. However, suppose further that the government can win the next election with a level of votes given by the iso-vote line V_1. In order to increase its re-election chances, the incumbent government can increase aggregate demand, such as through an increase in government expenditure, which will expand the economy and causes unemployment to fall. In the short-run it will lead to a movement off the LRPC and along the short-run Phillips Curve (SRPC) from *A* to *B*. At *B*, unemployment is lower, but at the cost of higher inflation, but shifting the economy to a higher iso-vote line at V_1.

Figure 2.1: The Nordhaus Political Business Cycle



However, post-election, the position at *B* is not sustainable as it does not lie on the LRPC. In particular, given that inflation expectations are adaptive, then higher inflation will have been caused by the expansion of the economy, and the SRPC will shift upwards from S_1 to S_2, so that in the long-run the economy shifts to position *C* that lies on the LRPC. However, as expectations adjust to the higher inflation rate, and the voters take time to realise that inflation has increased, the incumbent tackles inflation post-election. After winning the election, it

deflates aggregate demand (i.e., reduces government expenditure) to lower the inflation rate, but which is now at the cost of a higher unemployment rate. Consequently, the SRPC will shift back to S_1 and the economy returns to its initial position at *A*. Overall, it gives rise to a political business cycle, since the level of real economic activity as reflected by unemployment will follow a cyclical pattern that is related to the pattern of elections.

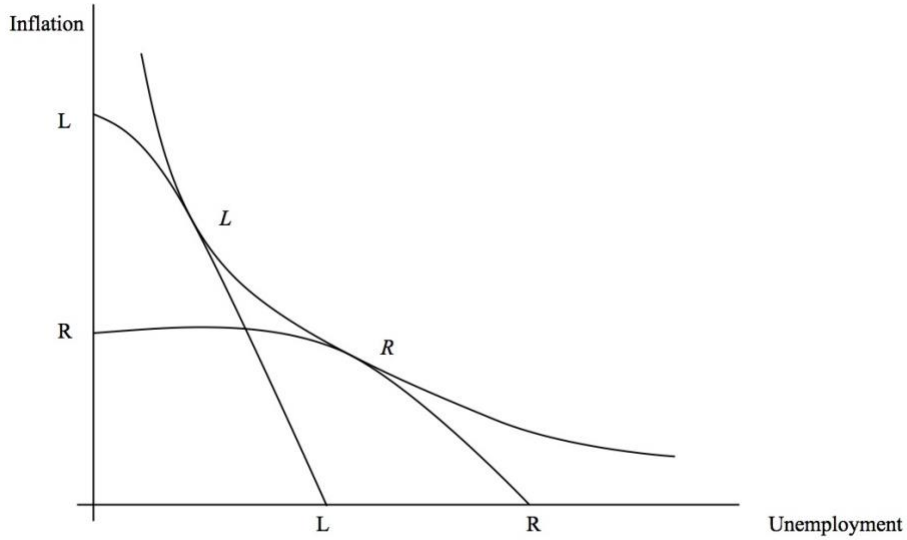
The Nordhaus (1975) model predicts that politically-motivated behaviour will create a pre-electoral expansion and a post-election contraction in economic activity. Lower unemployment will attract greater voter support at the election (position *B* in Figure 2.1), but increase inflation afterwards (position *C*). Using a sample of nine countries over the period 1947-72, and by examining the path of the economy in the first and second halves of an electoral term, Nordhaus concludes that the politically-motivated business cycle exists in some capitalist countries only. Since voters have a decaying memory and do not remember the incumbent's past behaviour, it takes advantage of this to increase its re-election chances. Further, it repeats this at each election, so that the voters are continually 'fooled'.

2.2.2 *Partisan Political Business Cycle*

In the Nordhaus model, all governments behave the same in office in seeking re-election, regardless of their political ideology. However, an alternative viewpoint is the partisan model, in which the incumbent's policies depend on its ideology, so that the governments differ in their objectives regarding the unemployment and inflation rates. According to Hibbs (1977), an incumbent chooses between price stability and higher unemployment or lower unemployment and high inflation. This arises since different political parties draw their support from different social groups (Zohlnhöfer, 2003), and the basic model can be explained as follows.

According to Lipset (1960), the main source of earnings for the lower income groups is wages as they depend more on the earnings from lower status jobs, and so feel more vulnerable to increasing unemployment. For this reason, it is likely that the left-wing party will place a relatively greater weight on unemployment and draw its support from lower income groups, but leading to less price stability. Conversely, a right-wing party draws its support from higher social classes, as their earnings include financial capital, such as shares, compared to the low-income class group that has wealth accumulation in the form of human capital only. They have higher status and more secure jobs, so are much less affected by increasing unemployment, whereas price inflation implies that the higher-income group will see a fall in their financial capital. A right-wing party therefore places a greater weight on price stability.

Figure 2.2: The Hibbs Partisan Model



Given all this, then according to the partisan theory advanced by Hibbs (1977) the parties do not promote the general interest of all voters, but rather the interests of particular social groups. Thus, when in power they pursue policies that are close to the preferences of the social groups that they represent and draw support from. Figure 2.2 illustrates the preferences of the right-wing (RR) and the left-wing governments (LL), identifying the critical iso-vote lines that will enable re-election of an incumbent for the voters that are respectively on the right and on the left of the political spectrum (assuming simple majority voting). Further, assuming parties face the same SRPC, Figure 2.2 suggests that they will behave differently to win voter support.

Hibbs (1977) paper is empirically-based, examining whether preferences for inflation and unemployment of right- and left-wing governments differ in advanced capitalist countries. He focuses on the period 1945-69, and twelve West European and North American countries. He finds macroeconomic outcomes follow a partisan trend, with differences between the political parties in office that reflect the respective supporters' preferences for left- and right-wing policies. In the US context, there is evidence of a fall in inflation during the electoral terms of the Republican party in office (right-wing), but higher real output growth for the Democratic party in office (left-wing). There is also evidence that the long-run unemployment rate is around 2.5 percentage points lower for the left-wing party than a right-wing party in the US. The results are similar for the UK, with unemployment rates that are 1 percent lower for the left-wing Labour Party in office compared to the right-wing Conservative Party. Overall, the Hibbs model is consistent with a partisan government manipulating the economy, but seeking support from just some part of the electorate.

2.2.3 *The 'Satisficing' Model*

The theory of the political business cycle is not limited to either the opportunistic or the partisan models since there are approaches that combine elements of these. This is the empirically-based model of Frey and Schneider (1978a), which brings together the Nordhaus (1975) political business cycle and the Hibbs (1977) partisan theory into a single framework. It argues that there is a trade-off between the opportunistic and partisan manipulation of the economy due to electoral and ideological objectives. The choice between these is linked to the popularity of the incumbent and its chance of winning an election, and in particular, its lead in the Opinion Polls over the main opposition party.

There is 'switching behaviour' under the Frey and Schneider model. If the lead in the Polls is such that the government is confident of remaining in power at the next election it will adopt behaviour consistent with partisan behaviour. However, if the lead or deficit in the Opinion Polls is such that the government is not confident of regaining office it will switch to implement expansionary fiscal policies to increase its popularity. In order to understand whether the incumbent government is confident of winning the election or not, it is supposed that at each time period the incumbent has some notion of a 'critical' lead in the Opinion Polls. If the actual lead in the Polls relative to this is such that the government faces a 'popularity deficit' then it pursues re-election goals, but otherwise it pursues policies consistent with its ideology, so that it satisfices, i.e., it does not maximise a single over-riding objective. This is a 'weak' partisan model as the partisan effects are dependent upon its re-election chances.

The model of Frey and Schneider (1978a) supposes that the choice of policies is constrained by the economy, so that if there is high unemployment or inflation or a low growth rate of real income then these will have a negative impact on popularity, and conversely. Frey and Schneider examine the opportunistic and partisan behaviour of different British governments, assuming that there are two political parties and so one opposition party. They suppose the Conservative Party in office seeks to reduce government spending as part of its ideological goal, so that taxes are lower, whereas the Labour Party in office seeks to reduce unemployment and redistribute income, so that its ideological goal is to increase government expenditure relative to GDP.

In their empirical analysis, Frey and Schneider (1978a) use as the dependent variable either government expenditure or government revenue from receipts. The independent terms consist of: two ideology variables for the Labour or Conservative parties; variables for the popularity deficit; a time variable that shows how much time the government has left to improve its popularity from the last election; and economic variables to capture the constraints. Using

an Ordinary Least Squares estimator, Frey and Schneider find that the right- and left-wing governments opt for expansionary policies as the popularity deficit increases, leading to a rise in government spending and less tax revenue. Irrespective of whether it is a right- or a left-wing party, it therefore adopts expansionary policies before elections when it perceives it is likely to lose an election. Using data for the US over the period 1953-75, Frey and Schneider (1978b) also suggest that the politicians adopt opportunistic and partisan behaviour. Overall, the model shows that in order to increase their re-election chances incumbent governments pursue policies that are different to their ideological goals.

2.3 The Political Budget Cycle and Rational Partisan Theory

The work of Nordhaus (1975) and Hibbs (1977) focuses on a political business cycle in economic outcomes, such as inflation and unemployment, but both models rely on the adaptive expectations hypothesis. This suggests that economic agents base their expectations and behaviour on past events only, but which could respond quite slowly depending on how quickly expectations adjust. These expectations fell out of fashion in the 1980s as they imply that economic agents make systematic mistakes, so that economists shifted attention to the rational expectations hypothesis. This means that voters cannot be 'fooled' about how the government is performing in maintaining a sound economy, as they understand the underlying the economic model, and so do not change their voting behaviour in response to pre-electoral behaviour. There are two main models: Section 2.3.1 focuses on the 'pure' political budget cycle of Rogoff and Sibert (1988) and Section 2.3.2 on the rational partisan theory of Alesina (1987). Like the Hibbs model, which pre-dates rational expectations, the latter model includes elements of both opportunistic and ideological government behaviour.

2.3.1 *The Pure Political Budget Cycle*

The Nordhaus (1975) model supposes that voters are not perfectly rational since they assess the current economic performance only and are ignorant of the long-run effects of the current economic policies. It implies that the expected inflation rate of voters is based only on the past values of inflation, without any consideration about the future consequences of policies. Rogoff and Sibert (1988) introduced the rational political business cycle. This is based on voter rational expectations, but also on asymmetric information on the part of voters over the 'competence' of the government. It gives the incumbent the opportunity to undertake politically-motivated behaviour.

In the model of Rogoff and Sibert (1988) information asymmetries lead to an electoral cycle in the policy instruments, such as government expenditure or taxes. At the election time, the electorate votes for the party that they believe will give them the highest welfare, and this is linked to the competency of the government. However, voters do not observe competency, but rather they infer it from the policy outcomes, which crucially are observed with a lag. In the run-up to an election the incumbent therefore takes advantage of this by manipulating the policy instruments to attract more votes, irrespective of whether it is competent or not, but which the voters only discover after the election. In contrast to the Nordhaus model, which generates a political business cycle in the policy outcomes of inflation and unemployment, the rational model predicts a cycle in the policy instruments, such as in taxes, benefits or even interest rates, as the government engages in pre-electoral behaviour.

According to Rogoff and Sibert (1988), competence is defined as the ability to pay for government spending out of a given level of government revenue, so that a competent incumbent requires less revenue to supply a given level of public goods or services. Like Nordhaus (1975), Rogoff and Sibert do not differentiate the political parties by their ideologies, and the voters choose the party based on competency. However, unlike Nordhaus, the manipulation of the economy is temporary and lasts only as long as the duration for the change in the policy instruments to be reflected in the policy outcomes. In non-election periods, social welfare is the main objective of the government, so that they present a balanced budget to show how competent they are. However, during an election period, incumbents are faced with choosing policies that will either maximise social welfare or increase the chance of being re-elected. Competent incumbents do not resort to creating any electoral economic cycle, as they are confident of winning the election. Further, low-performing incumbents find it too expensive to engage in manipulation. Hence, it is incumbents with a medium level of competence that signal competence. They do this either by increasing spending more than is necessary or they opt for tax cuts for the same level of government outputs.

A pre-electoral expansion of the economy is a way for an incumbent to show that it is more competent than it actually is. Voters misunderstand this, as they do not observe competence at election time, and they are unaware of the post-electoral social welfare loss from high government spending or low taxes that need to be financed or remedied after the election due to a lack of competence. The incumbent government can therefore inflate the economy by creating a temporary fiscal boost to increase its popularity with the voters, which is financed by an increase in taxes post-election. Due to the information asymmetry between the voters and the government, the post-electoral increase in taxes is not foreseen at election time by rational voters.

While voters are rational, the Rogoff and Sibert (1988) model supposes that they suffer from an information asymmetry, so that it is about a lack of information rather than poor information processing. If voters are able to correctly assess the true competence of the government, the incumbent will not be able to deceive the voters. The electoral cycle will exist only in the main budgetary concepts such as government spending, revenues, deficits and taxes, as both moderately competent and incompetent governments inflate the economy, but other governments will not. It is an important divergence from the earlier models that predict electoral manipulations in outcomes. The shift in the focus from macroeconomic outcomes to fiscal policy instruments has led Rogoff (1990) to later refer to this as a model of a 'political budget cycle'.

2.3.2 *The Rational Partisan Theory*

The partisan model of Hibbs (1977) suggests that the right- and left-wing parties have inflation and unemployment targets under the adaptive expectations hypothesis. Alesina (1987) examines whether such a partisan political business cycle exists under rational expectations. In this case, voters also have imperfect information, but in this model it is about the election result, i.e., whether the right- and left-wing party wins. This approach is known as the rational partisan business cycle model.

In the rational partisan theory, the political parties have ideological views and implement different policies in office. However, since the outcome of the election is not known beforehand, and is not reflected in the contracts agreed by private agents, such as labour market contracts, the economy experiences a 'shock' after the election until these contracts can be renegotiated to reflect the actual outcome. If the right-wing government is elected, the economy will experience a deflationary 'shock' in the period following the election since on average voters will expect a higher level of output growth, but if the left-wing party wins the economy will experience higher inflation than is on average expected *ex ante* to the election. The model assumes that the rational voters have imperfect information on the election outcome and that the policy 'surprise' arises because of uncertainty regarding the election result.

The model of Alesina assumes a Lucas 'surprise' supply function of the form:

$$y_t = \beta[P_t - W_t] + \bar{y}_t, \tag{2.5}$$

where y_t is the rate of output growth, $\bar{y}_t$ is the natural rate of growth of output, P_t is the inflation rate and W_t is the growth of nominal wages, where $\beta > 0$. It is based on Fischer's (1977)

rational expectations labour market model, where wage contracts are signed annually. Since wage bargainers aim to maintain the real value of their wages, the nominal wage growth is equal to the current expected inflation rate:

$$P_t^e = W_t. \tag{2.6}$$

The rational expectation of inflation in the next period is used to set wage contracts in the next period, so that substituting Equation (2.6) into (2.5) shows that output growth deviates from its natural rate as a result of an inflation surprise from a 'shock':

$$y_t = \beta[P_t - P_t^e] + \bar{y}_t. \tag{2.7}$$

The Alesina (1987) model assumes that governments use monetary policy to control the inflation rate. The presence of party preferences with regard to inflation, with the right-wing party more averse to inflation than the left-wing party, suggests that a change in government due to an election will lead to an inflation surprise that causes output to change from its natural growth path. Since voters sign their wage contracts prior to knowing the election results, the post-electoral inflation rate may be different from the rational expectation of inflation made in the pre-election period.

If the government is a left-wing party that aims to reduce unemployment and the wage negotiators assume that the incumbent will be re-elected, then they will sign nominal wage contracts that include a high expected inflation rate. However, if an inflation-averse government wins the election, it will use contractionary monetary policy to reduce inflation and hence create a surprise that has not been considered in wage contracts. Consequently, if the inflation-averse party wins the election, Alesina (1987) predicts that there will be a rise in unemployment and a fall in output. The opposite holds if there is a change from a right- to a left-wing government, since there is a post-electoral increase in output growth and a fall in unemployment under the left-wing government. Output growth returns to its natural rate when the inflationary expectations adjust to the new government, so that the effects are short-lived.

In the model of Alesina the probability of a political party winning the next election can be forecast using Opinion Polls, so that price and wage setters base their decisions on the forecasts made prior to the election. After winning the election, the incumbent imposes the policy measures that are in line with its ideology. Thus, for example, in the US, Republicans will adopt policy instruments that maintain a low level of inflation, while the Democrats choose policies to lower unemployment. As such, the voters are forward-looking and they are

conscious of the impact of either party winning the election. However, the partisan cycle exists because the agents are not able to predict the election result with certainty. Alesina (1987) concludes that the elections will lead to temporary changes in unemployment and output growth.

2.4 Empirical Evidence: Policy Outcomes

The literature review of the politico-economic models can be divided into four broad approaches for describing politically-motivated government behaviour in relation to general elections. The first two models are the pure political business cycle and the partisan theory, where under the latter model the different parties in office pursue different policies. The other two approaches are the rational political business cycle and the rational partisan theory that are based on rational expectations on the part of the electorate. Section 2.4.1 examines whether the empirical literature on the political business cycles offers support for the Nordhaus model and Section 2.4.2 examines the empirical evidence for the partisan and rational partisan models. The evidence for the policy instruments, including the political budget cycle, is considered in Section 2.5, while Section 2.6 examines whether voting is influenced by the instruments.

2.4.1 *Support for the Nordhaus Political Business Cycle*

Using data for nine advanced-democratic countries (i.e., Australia, Canada, France, Germany, Japan, New Zealand, Sweden, the UK and US), Nordhaus (1975) tests his hypothesis of opportunistic cycles in the unemployment rate for the period 1947-72. The hypothesis tested is whether the rate of unemployment decreases in the first half of an electoral term and increases in the second half. This is done in order to show support for the politically-motivated business cycle in policy outcomes as the election draws nearer. Nordhaus finds mixed evidence, since political business cycles do not exist for Australia, Canada, Japan and the UK, there is modest support for France and Sweden, and they do not exist for Germany, New Zealand and the US.

There is some empirical research however that finds support for the Nordhaus model. Allen *et al.* (1986) estimate a vote function for the US, where this is a function of economic and political terms, where the former includes outcomes and monetary instruments. The implementation of monetary policy is influenced by elections if the incumbent is motivated to choose expansionary policies during the term in office followed by post-electoral contractionary policies. Allen *et al.* conclude that the growth rate of money supply increases

in the third and fourth years during an incumbent's time in office, and that it decreases in the two years after an election, offering some support.

Regarding the unemployment rate, for the UK over the period 1957-80, Keil (1988) finds that the unemployment rate falls as the election approaches and increases post-election. Findlay (1990) finds significant evidence that prior to the presidential elections under US Republican administrations over 1951-87, unemployment falls but that it increases after an election. Specifically, the fall occurs in the last two years of a US Republican administration, but the rise in unemployment is observed during the first two years of newly-elected US Republican administration. Similar to Allen *et al*. (1986), this study finds that elections affect economic activity. Some other studies also find support for electoral cycles in both inflation and unemployment, including McGavin (1987) and Haynes and Stone (1989, 1990).

However, other studies do not support the presence of the opportunistic political business cycle. In an early study by McCallum (1978), quarterly data is used for the US economy over the period 1948-74 to test the Nordhaus model. McCallum studies the relationship for unemployment using electoral dummies for US elections, and concludes that anticipated policy does not generate a trade-off between inflation and unemployment, which rejects the Nordhaus (1975) political business cycle. Like McCallum (1978), Beck (1982) tests the Nordhaus hypothesis using monthly data for the US inflation and unemployment rates from January 1961 to June 1973. He finds that there is no pre-electoral effect in unemployment and that the post-electoral effect is mixed. Unemployment falls post-election for the Kennedy administration, but there is no such electoral effect for the Johnson administration, while as regards inflation there is no evidence for a fall in inflation after elections. Beck (1982) notes that these results might either be because the incumbents do not try to manipulate the economy or because they are unsuccessful in their manipulations.

Other evidence does not conclude in favour of the Nordhaus model, including studies such as Golden and Poterba (1980), Alt and Chrystal (1981) and Davidson *et al*. (1990). Overall, when taken as a whole, the econometric studies of do not offer overwhelming evidence for the opportunistic manipulations suggested by the pure political business cycle, and at best there is mixed support. This has led studies on the political business cycle moving towards the consideration of the partisan theory.

2.4.2 *Support for the Partisan and the Rational Partisan Models*

In this section, the empirical studies that have been carried out to test the partisan and the rational partisan models are explored. To start with, Hibbs (1977) tests his model using a

dynamic time-series analysis to assess if party ideology has an impact on unemployment and inflation rates in the US and UK. The empirical analysis is for 1948-72, and it concludes that there is a decline in unemployment for the electoral terms of the left-wing UK Labour and US Democratic parties, but that there is a rise in unemployment for the right-wing UK Conservative and US Republican parties. It occurs in the US after controlling for other factors such as the Korean and Vietnamese wars, which may have lowered the level of the labour force. Using data for fourteen Western industrial countries over the 1960-83 period, Alt (1985) also finds evidence for the partisan model, as left-wing governments have lower unemployment compared to the right-wing governments. To evaluate the effect of ideology on macroeconomic outcomes, Chappell and Keech (1986) use quarterly data for the US over 1953-84, and they find that money growth is greater and the unemployment rate is lower under the US Democratic Party compared to the Republican Party.

Other evidence is also supportive of the partisan model. Using quarterly real personal income growth as a measure of real macroeconomic activity, Krause (2005) shows that over 1948 to 2004 US Republicans increase real personal incomes more than the Democrats prior to election, and this is in line with the partisan theory. However, contrary to this, Beck (1984) finds that there no evidence to support the theory of Hibbs (1977). The main findings of Beck are: firstly, there is no evidence in favour of the political business cycle, and secondly, the implementation of monetary policy under the US Democratic presidents is less strict compared to Republicans over the period 1955-82. However, not all Democratic presidents are associated with looser monetary policy and not all Republican presidents adopt tight monetary policy. Beck finds that the Kennedy administration did not adopt a loose monetary policy.

Some of the empirical studies have been carried out to test the rational partisan models, and these are now explored. For a range of countries, Alesina and Roubini (1992) use quarterly data for 18 OECD countries over the period 1960-87 to examine if elections have an impact on GDP growth, unemployment and inflation. Using dynamic panel OLS regressions to test for temporary electoral effects on the rates of output growth, unemployment (difference between domestic and OECD) and inflation they do not find significant evidence of a partisan effect. Instead, they find in favour of the rational partisan theory of Alesina (1987). Focusing on 20 OECD countries, Maloney *et al*. (2003) find evidence to support the rational partisan theory. Compared to a right-wing party, they find that a left-wing party adopts an expansionary policy and leading to a higher output. Likewise, for a panel of OECD countries, Berleman and Markwardt (2007) find evidence in favour of the rational partisan theory.

However, the empirical analysis of Carlsen and Pedersen (1999) shows mixed evidence for the rational partisan model. While there is evidence supporting the theory for Australia,

Canada and UK, and strong evidence in the case of the US and Sweden, there are inconclusive results for West Germany and Norway. Further, on updating the dataset used by Alesina and Roubini (1992) to the year 1995, Kiefer (2000) suggests that the rational partisan theory is not consistent with the data, that is, rational economic agents do not depend on partisan differences to forecast inflation. Finally, Heckelman (2006) concludes that there is no evidence of rational partisan theory in unemployment for the seven OECD countries. Overall, like above, the evidence for the rational partisan theory is somewhat mixed.

2.5 Empirical Evidence: Fiscal Instruments

This section considers the empirical evidence for the Rogoff and Sibert (1988) model, as described above. As termed by Rogoff and Sibert, the cyclical changes in fiscal instruments caused by the timing of elections is known as the 'political budget cycle'. Although a relatively small number of studies have examined it in terms of monetary policies (Van der Ploeg, 1989; Golden and Poterba, 1980; Hallerberg et al., 2002), the main focus of this section is the effect of elections on the fiscal instruments. This is for the developed countries in the Organisation for Economic Co-operation and Development (OECD) and European Union (EU), as well as for developing countries. The consideration of the evidence for electoral effects is broad in that it considers the opportunistic and partisan electoral effects on the fiscal instruments. Overall, I find that there is evidence to support the political budget cycle in both the developed and developing countries, and which is stronger than that found for policy outcomes.

2.5.1 *Developed Countries*

This section discusses the empirical evidence for fiscal policies, such as government spending and taxation, and how they are affected by elections in developing countries. A summary of the main empirical studies and findings for the OECD and EU is given in Table 2.1, where the studies are listed in alphabetical order. I refer to these studies in my discussion. I begin by looking at the evidence for OECD countries in Section 2.5.1.1, followed by the EU member states in Section 2.5.1.2.

Table 2.1: Electoral Effects on Fiscal Instruments in OECD and EU Countries

Author	Country	Year	Main Findings
Afflatet (2017)	28 EU countries	1995-2015	Despite implementation of the Strategy and Growth Pact (SGP), which seeks to restrict public deficits, elections have minor influence on budget balances.
Akhmedov and Zhuravskaya (2004)	Russia	1995-2003	There is evidence of pre-electoral government spending increases.
Andrikopoulos *et al*. (2006)	11 EU countries	1965-97	No policy actions leading to the creation of electoral or partisan cycles in tax instruments and target variables. They are primarily concerned with the pursuit of stabilization policies rather than with policies giving rise to political cycles.
Ashworth and Heyndels (2002)	18 OECD countries	1965-95	In election years, tax structures are changed significantly less than in other years, which suggests that the governments do not engage in electoral manipulations of the tax structures.
David and Formanová (2016)	Czech Republic	1993-2014	No evidence of electoral manipulations on tax policy setting.
Donahue and Warin (2007)	European countries	1979-2005	Political budget cycle across European countries over 1979-93, but after this time, the SGP has impeded the electoral fiscal instruments manipulations.
Efthyvoulou (2012)	27 EU countries	1997-2008	Strong evidence that EU governments manipulate fiscal policy to enhance their re-election. It is greater in the Eurozone countries compared to other countries.
Ferede *et al*. (2015)	10 Canadian provinces	1973-2010	Evidence of opportunistic effects for different taxes, but partisan effects only for gas and 'sin' taxes and for corporation income tax.
Foremny and Riedel (2014)	Germany	2000-08	Growth rate of the local business tax is significantly reduced in the election year and the year prior to the election, while higher in the year after the election.
Gonzalez (2002)	Mexico	1957-97	Spending on public infrastructure and current transfers to earn votes.
Katsimi and Sarantides (2012)	19 OECD countries	1972-99	Overall no electoral effect on government deficit and expenditures, but electoral cycle exists in government revenues.
Kneebone and McKenzie (2001)	10 Canadian provinces	1966-97	No tax rises during election years, and government spending in highly-visible areas like schools and roads. Partisan responses in programme spending choices.
Mink and de Haan (2006)	EU member countries	1999-2004	Strong evidence SGP does not stop policymakers pursuing expansionary fiscal policies before elections. Increase in budget deficit during the election year. Lower taxes or extra subsidies to special interest group to be re-elected. Fiscal policy somewhat more expansionary under left-wing governments.
Pettersson-Lidbom (2003)	Sweden	1974-98	State spending higher and taxes lower in the election year. In the post-election year, the government spends less and taxes relatively more.
Poplawski-Ribeiro (2009)	20 OECD and 11 Eurozone countries	1980-2007	Cyclically-adjusted primary deficit increases in the election year.
Veiga and Veiga (2007)	278 Portuguese Municipalities	1979-2001	Expenditure increases during the election year, and on capital projects in more visible sectors. Mayors manipulate spending more than taxes during the election year where they have greater control.

2.5.1.1 *OECD Countries*

To test the electoral (opportunistic) and partisan effects on the tax structure, Ashworth and Heyndels (2002) carry out a study of 18 OECD countries over 1965-95. The tax structure used is mainly the composition of tax revenue (e.g., on income, consumption and other taxes) as a percentage of Gross Domestic Product, for which an index for the tax structure is constructed. They find that there is there are no electoral cycles in the tax system, so that governments do not engage in manipulating it to increase their re-election chances. Similarly, Katsimi and Sarantides (2012) investigate whether the composition of fiscal policy is affected by elections in nineteen high-income OECD democracies, where this includes the budget surplus/deficit, government expenditure and revenue. Over the period 1972-99 they conclude that while there is no evidence of an electoral cycle in the government deficit, this does exist for the expenditure and revenue. Specifically, there is a negative effect of elections on capital expenditure, although no effect on current expenditure, while there is evidence that direct taxation is affected by the timing of elections, but not so for indirect taxation.

For a single OECD country, both opportunistic and partisan cycles in taxes are explored by Kneebone and McKenzie (2001). Their study is over the period 1966-97 for the ten Canadian provinces that have fiscal autonomy over their public services. They find that there are electoral cycles in both revenue and spending, whereas the partisan effects do not exist for revenues, but are prevalent in government spending. For the same Canadian provinces, Ferede *et al.* (2015) examine the effect of political factors on the statutory tax rates over 1973-2010. The included taxes are personal and corporate income taxes, consumption taxes and gas and 'sin' taxes (demerit goods). They find that there are no partisan effects in personal and consumption taxes, but that they exist in corporation income tax and gas and sin taxes. However, opportunistic behaviour is again observed, which in this case is for all four tax types.

In the case of another OECD country, Mexico, which joined in 1994, research has taken account of the level of democracy. According to Gonzalez (2002), as a country moves towards democracy the level of transparency should increase, resulting in a country experiencing weaker political business cycles as the voters become more aware of manipulations. Gonzalez uses data to assess how democratization influences the choice of economic policy as an election approaches. The analysis shows that the Mexican government manipulated infrastructure spending over the period 1957-97, with spending increasing before an election and decreasing afterwards, and this is despite Mexico going through its democratization process. Overall, the studies show that electoral cycles are present in some kinds of government spending and taxation in many OECD countries, but that again there is weaker evidence for partisan effects.

2.5.1.2 *EU Member States*

The empirical literature also examines whether the political budget cycle is present in EU countries, and this is more directly relevant to the empirical work that I undertake below. Andrikopoulos *et al.* (2006) use tax instruments for 11 EU member countries over the period 1965-97 to test for opportunistic and partisan effects. The taxes are direct taxes and taxes on household income, on corporate profits, on use, ownership or transfer of property, on production, and excise taxes. However, in stark contrast to Ferede *et al.* (2015), they find no evidence of either opportunistic or partisan effects. Instead, they find that governments implemented stabilization policies to alleviate the problems of inflation and unemployment experienced in the 1970s and 1980s.

A number of EU studies focus on the Stability and Growth Pact (SGP), which was introduced in 1997 in the run-up to the creation of the Euro currency. In particular, EU Member States agreed to strengthen their monitoring and coordination of national fiscal and economic policies to enforce the deficit and debt limits established by the 1992 Maastricht Treaty. Under this, governments agreed to limit their deficits to 3% of GDP and public debt to 60% of GDP as part of Economic and Monetary Union (Schuknecht *et al.*, 2011; European Commission, 2019). Mink and de Haan (2006) investigate if the SGP restricted governments in their use of expansionary policies for the period 1999-2004, but they find that this is not the case. There is strong evidence that during an election year the governments increase the re-election chances through higher budget deficits from expansionary fiscal policies and lower their taxes.

Donahue and Warin (2007) explore whether the political budget cycle exists after the SGP. Using a sample of 14 EU member countries over 1979 to 2005, they find that there is political budget cycle, but that the fiscal manipulations are to some extent constrained by the Maastricht Treaty and the SGP. In his study, Poplawski-Ribeiro (2009) examines whether the implementation of the Maastricht Treaty and SGP encouraged fiscal discipline in the Eurozone, including electoral manipulations. Similar to Donahue and Warin (2007), the study finds the presence of political budget cycles in the Euro-11 over the 1980-2007 period. However, the findings suggest that compared to the Maastricht Treaty, the SGP has not been effective in strengthening the fiscal discipline, and that incumbents from the Euro-11 countries have continued to manipulate their fiscal policies for re-election purposes.

Given this lack of fiscal discipline, a recent study by Afflatet (2017) analyses whether joining the European Monetary Union (EMU) or breaching the SGP limits in 2003 affects the subsequent deficits. The analysis uses different dependent variables, namely the primary balance and the budget balance. According to Afflatet, on joining the EMU, there seems to be

no election effect on either the primary balance or the budget balance in the 28 EU countries from 1995 to 2015. With regards to breaching the SGP limits, restricting the sample to twelve member countries, the results indicate that there is no electoral effect of this on either of the dependent variables.

In a similar way, Efthyvoulou (2012) examines the political budget cycle in 27 EU Member States over 1997-2008. He finds that the political budget cycle exists, but that it is much larger in the states that adopt the euro as their sole currency. The electoral effects occur mainly in increased government spending. The study supports other work, e.g., Brennan and Buchanan (1980), Karran (1985) and Frohlich and Oppenheimer (1990), who do not find evidence in favour of political business cycles in tax instruments. Focusing on direct taxation, Konstantakis *et al.* (2015) examine a political budget cycle in the EMU countries over 1996-2013, and they find a significant negative effect on direct taxes prior to elections.

Focusing on a single-country, David and Formanová (2016) examine the relationship between electoral cycles and tax variables of the Czech Republic over the period 1994 to 2014. The tax variables used in the analysis are for the nominal income tax rate, effective income tax rate, total tax collection and total tax liabilities of individual income taxes. They find that there is no evidence of electoral cycles in these taxes, but in the case of the nominal and effective tax rates they argue that this may be because the Czech Republic uses a national 15% tax rate.

A number of studies look at political budget cycles at the sub-national level. Pettersson-Lidbom (2003) use data on total municipality spending and taxes in Sweden for the period 1974-98. This finds that in an election year there is a rise in spending and a fall in taxes, but evidence that re-elected governments spend less and tax more post-election. This also assumes that political parties do not matter for the choice of fiscal policies, so that partisan effects are not tested. Later, Pettersson-Lidbom (2008) uses a regression-discontinuity analysis for the same sample and finds strong evidence that right-wing parties tax less than the left-wing parties in the run-up to elections.

To investigate the presence of opportunistic behaviour by local governments, Veiga and Veiga (2007) focus on the 278 municipalities of mainland Portugal over the period 1979-2001. They test for the rational political business cycle, focusing on total municipal expenditure, capital expenditure, investment expenditure, taxes and a balanced budget. Their empirical results show that there is an increase in investment expenditure and a decrease in taxes, which indicate that the incumbent mayors adopt opportunistic behaviour. To examine if elections affect tax policy choices, Foremny and Riedel (2014) find that there is an electoral cycle in the local business tax for the German municipalities over the period 2000-08. Specifically, there

is a reduction in the local business tax rates the year before and in the election year, while the year after the election, the local business tax rates increase.

Finally, for developed countries outside of the OECD and EU, Akhmedov and Zhuravskaya (2004) analyse the political cycles in the Russian local government over the period 1995 to 2003. Using monthly data, they find that one month before an election there is a significant increase in revenue to finance an increase in government spending. However, during the election month and one month afterwards, there is a decrease in revenue. Akhmedov and Zhuravskaya also mention that with democracy, political budget cycles exist in Russia, but that they have decreased in magnitude. Overall, the empirical studies for the developed countries show that there is evidence to support electoral manipulations of the fiscal instruments, as well as during local elections for some EU countries. Further, they show that there are pre-electoral increases in government spending and pre-electoral tax cuts, and this supports the Rogoff and Sibert (1988) model of the political budget cycle.

2.5.2 *Developing Countries*

This section focuses on the empirical studies for developing countries that examine for a business political cycle in the fiscal instruments. A summary of the relevant studies and main results is given in Table 2.2, which again is by alphabetical order.

First of all, some studies, such as Shi and Svensson (2006), consider both developing and developed countries. Over 1975-95 they find an increase in budget deficits as the election date approaches, due to both a rise in public expenditure and a fall in revenue. In particular, there is a 23 percent increase in the fiscal deficit during election years, which is greater for developing countries than for developed countries. Shi and Svensson argue that this is explained by the institutional environment, which is weaker in developing countries in terms of government corruption in, the quality of bureaucracy and rule of law. In the sample of developing and developed countries, they find that countries classified as 'new democracies' experience deficit cycles from a rise in spending, but that there is no such effect for established democracies. They argue that voters in new democracies are less aware of electoral manipulations than they are in established democracies as there is less information available.

Table 2.2: Electoral Effects on Fiscal Instruments in Developing Countries

Author	Country	Year	Main Findings
Block (2002)	44 Sub-Saharan African countries	1980-95	There is evidence of electoral cycles in government spending, but no significant electoral effect on tax revenue.
Chaudhuri and Dasgupta (2006)	14 Indian states	1974/75 to 1994/95	Although there is no evidence of electoral cycles in state governments' own tax revenue, there is a significant decrease in commodity tax revenue in the run-up to elections.
Dash and Raja (2014)	14 Indian states	1980/81 to 2006/07	The data show that, irrespective of whether it is direct or indirect taxes, the volume of tax collection declines during the years before the elections.
Ehrhart (2013)	56 developing countries	1980-2006	Although there is evidence of lower indirect taxes being applied by incumbent governments in the period just prior to an election, there is no effect of election on direct taxes.
Faal (2007)	Papua New Guinea	1988-2004	It shows evidence of opportunistic political budget cycle in development and primary government expenditure, but there is no significant electoral effect on recurrent expenditure and government revenues.
Hallerberg and Scartascini (2016)	Latin America	1990-2004	During electoral periods, increasing taxes becomes highly unlikely, even if the government is facing financing problems.
Khemani (2004)	14 Indian states	1960-96	The incumbents aim to target a particular group of voters, hence there is evidence of a fall in the producers' tax revenue collection.
Prichard (2018)	98 developing countries	1980-2010	There is a fall in tax collection prior to elections. The tax cuts have been competitive and had led to incumbents being replaced.
Schuknecht (2000)	24 developing countries	1973-92	There is also evidence of increases in public spending and tax reduction prior to an election.
Shi and Svensson (2006)	Panel of 91developed and developing countries	1975-95	Government spending increases and revenues fall in election years. Political budget cycles are of much greater magnitude in developing countries than in developed countries.

Schuknecht (2000) analyses the relative importance of government revenue compared to government expenditure for improving government popularity prior to elections in 24 developing countries over the period 1973-92. Using OLS estimation, Schuknecht shows that governments reduce taxes prior to elections. In a study of Sub-Saharan countries, Block (2002) finds that countries experience electoral cycles in government spending, but no significant electoral effect on tax revenue. This leads to a 1.2 percentage point rise in government fiscal deficit during election periods. It suggests that governments in these democratic developing countries have a preference for electoral increases in spending over tax cuts.

Khemani (2004) focuses on electoral manipulations in taxes, spending and public service delivery in 14 major states of India over the period 1960-94. The findings show that there is a decrease in taxes, an increase in spending and an increase in public service delivery in the year leading to an election. Khemani argues that the manipulations of fiscal policies in the run-up to elections are carried out as a way to attract the uninformed and myopic voters. Further empirical work on Indian states is conducted by Chaudhuri and Dasgupta (2006), who find that there is a decrease in the commodity tax revenue in election years, and Dash and Raja (2014), who find a decrease in the volume of direct and indirect taxes a year before an election.

Faal (2007) uses quarterly time series data to test for the presence of political budget cycles in Papua New Guinea. This is explored for government, recurrent and development expenditure, for net government credit and for total government revenue. It finds evidence of pre-electoral increases in government expenditure and development expenditure, but there is no evidence of electoral cycles in recurrent expenditure and revenue. Since the net credit to government increases before the elections and in the post-election years, Faal suggests that the election-related expenditure is partly financed by domestic borrowing.

Of course, in developing countries only a small proportion of the population are likely to contribute to income taxes, since most of the population tends to work in the informal sector, such as farming (Dreher and Schneider, 2010). Thus, Ehrhart (2013) suggests that the voters should prefer lower indirect taxes to lower direct taxes in developing countries and assess this prediction. Using a sample of 56 developing countries over the 1980-2006 period, Ehrhart indeed finds that there is a significant pre-electoral cut in indirect taxes for a sample of 56 developing countries, but that direct taxes do not change. However, post-election, indirect taxes are not increased to compensate for the pre-election fall. Hallerberg and Scartascini (2016) also examine whether elections influence the choice of tax instruments, looking at Latin America over 1990-2004. They examine three types of taxes: Value Added Tax (VAT), personal income tax and corporate income tax. Using an ordered logit model they find that incumbents are more

likely to lower VAT and corporate income tax during an election period, but that there is no significant change in personal income tax. As different types of taxes are manipulated during electoral times, it suggests that different taxpayer groups are targeted by the government.

A more recent study by Prichard (2018) uses newly available data on taxation from the *International Centre for Tax and Development Government Revenue Dataset* to test for the impact of elections on tax collection. This focuses on 98 developing countries over 1980-2010. The study examines whether specific types of elections have an effect on pre-election tax collection. These comprise 'elections in general', which is captured by a dummy variable set to the value of one if there is an election and zero otherwise, and 'competitive elections', which is captured by a dummy that is set to the value of one if the government wins 60 percent or less of all the seats in the government, and zero otherwise. The findings reveal that, in general, elections do not have an effect on tax collection, but there is evidence of a fall in pre-electoral tax collection when there are competitive elections. For the developing countries, overall it can be said that electoral cycles do exist in taxation. The prevalence of electoral cycles in developing countries may be attributed to the less democratic systems and weaker institutions compared to developed countries.

2.6 Fiscal Instruments Affecting Re-Election Prospects

In Section 2.5, I reviewed the literature on the electoral manipulations of the fiscal instruments by governments to increase their re-election chances. Of course, this pre-supposes that these instruments affect voting behaviour, and in this section I consider the complementary literature that examines the effects of fiscal instrument choices on the incumbents' electoral prospects. Electoral prospects can be in the form of voting behaviour or the incumbent's probability of re-election. In practice, voting behaviour is measured by the vote share of the incumbent government, while the incumbent's re-election probability is captured by a binary dependent variable in a regression analysis set to one if the incumbent is re-elected but zero otherwise. The literature also focuses on 'yardstick competition', which is where voters compare the fiscal policies with those of the neighbouring countries or jurisdictions. This section reviews the evidence on the effect of fiscal instruments on an incumbent's electoral prospects for both developed and developing countries. In general, it is expected that voters reward the incumbent for tax cuts and higher government spending, and conversely.

2.6.1 *Re-Elections and Developed Countries*

In this section, I examine the empirical literature on the effect of fiscal policies on voting behaviour and the re-election prospects of the incumbent governments in the developed countries, again concentrating on the OECD and EU member countries. I distinguish between the single-country studies, which include local elections within a country (e.g., senatorial elections in the US or municipal elections in Europe), and those that are made across countries, such as national general elections. Like before, Table 2.3 gives a summary of the studies that are referred to as part of this review.

2.6.1.1 *Single-Country Studies*

First of all, focusing on the single-country studies, Peltzman (1992) examines voting behaviour in the US from 1950 to 1988. Using voting data for the presidential, senatorial (election in a Senate to elect a senator) and gubernatorial (election in a state to elect a governor) elections, Peltzman finds that voters are 'fiscal conservatives'. Thus, rather than voters rewarding the incumbent for increases in spending, he finds that voters punish candidates from the incumbent party if they increase spending.

While voters are fiscal conservatives in Peltzman's 1992 study, Lowry *et al.* (1998) assume that the US Democrat or Republican parties have different fiscal policies preferences, and that the voters choose to vote for either the US Democrat or Republican party according to their own preferences. As such, the voter expectations regarding spending and taxes are linked to partisan expectations, that is, if the voters prefer an increase in spending then they support the left-wing party and if the voters give more importance to taxation, then they support the right-wing party. Lowry *et al.* find that the Republican parties are punished for increases in the US state budget over the 1968-92 period, and this is linked to the assumption that the Republicans are fiscal conservatives as compared to the Democrats.

Table 2.3: Re-Elections in the OECD and EU Countries

Author	Country	Year	Main Findings
Besley and Case (1995)	US	1950-86	Own tax change has a significant positive sign, while neighbours' tax change has a significant negative sign.
Bosch and Solé-Ollé (2007)	Spain	1991-2003	Own tax increase has a negative effect on vote share. The right-wing incumbents are punished when own tax rates increase compared to the left-wing governments.
Dubois and Paty (2010)	France	1989-2001	There is evidence of voters punishing the incumbent party for housing tax increases.
Geys and Vermeir (2008)	US	1959-2006	The study finds that increase in budget deficits and tax increase have a negative impact on the presidential popularity.
Johnson *et al*. (2005)	UK	1951-2001	There is no evidence of changes in marginal income tax having an effect on incumbents' re-election chances.
Katsimi and Sarantides (2015)	20 developed established countries	1972-99	Voters reward the incumbent party if there is a budget surplus, but election year public investment does not influence election outcome. There is no relationship between total revenues and the incumbents' re-election chances.
Lowry *et al.* (1998)	US	1968-92	Both US Republican and Democratic incumbents are penalised when they increase state budget in the election year.
Van Malderen and Gérard (2013)	Belgium	2012	Voters do not reward the local incumbents if they increase the tax variables, but there is no evidence that neighbours' tax changes affect re-election outcome.
Nelson (2000)	US	1946-93	Election year cuts in individual income tax rates, corporate income tax rates and sales tax rates lead to relatively small improvement in re-election prospects, but increases in individual and corporate income taxes affect re-election negatively.
Padovano and Petrarca (2014)	Italy	1995-2004	A rise in own local property and income tax rates has a negative impact on the incumbent mayors' chances of re-election.
Peltzman (1992)	US	1950-88	Voters punish candidates from the incumbent party in presidential senatorial and gubernatorial elections if they increase spending.
Revelli (2002)	UK	1979-90	There is evidence that an increase in own tax rates decreases the vote share of the incumbent party, while changes in the neighbours' tax do not influence election outcome.
Steiner (2010)	23 OECD countries	1965-2006	The incumbents are rewarded when they engage in high public spending.
Tillman and Park (2009)	19 OECD countries	1990-2006	Increases in the basic income tax rates have a negative influence on the share of governments' vote. There is also evidence of right-wing governments being penalised for income tax increases compared to no significant impact on the left-wing governments.

A single-country study using different tax categories is Nelson (2000). In this study, the statutory tax rates and the adoption of new tax rates over 1946-93 are used to carry out an analysis of whether voters punish US governors and legislators for increasing taxes, and whether their re-election chances are improved if they cut taxes before an election. The six tax categories are taxes on individual and corporate income, a general sales tax and excise duties on alcohol, cigarettes and motor fuels. Nelson (2000) finds there is little improvement in the re-election prospects of the governors when there are election year cuts in individual income tax, corporate income tax and sales tax rates, but a rise in either individual and corporate income tax or sales tax has a negative effect on the re-election prospects of the governors. Regarding the legislative elections, a relatively similar pattern is observed, except that the voters tend to penalise the governors more than the legislators.

The contribution by Geys and Vermeir (2008) is in estimating the effect of the tax burden and change in tax structure on the US president's approval ratings, as measured by a popularity poll. The level of tax burden is defined by the proportion of total tax burden to GDP, and the change in tax structure is captured by an index. Their findings show that there is a significant negative effect of the tax burden and tax structure turbulence on the presidential popularity over the period 1959-2006. From 1951 to 2001, Johnson *et al.* (2005) argue that politicians in UK general elections have promised to reduce taxes during election campaigns, so that given its prominence they examine the effect of income taxes paid by households on voter behaviour. The three tax measures used are the standard income tax rate, the effective income tax rate and the marginal income tax rate, which Johnson *et al.* believe affect voter behaviour. They find that a fall in the standard income tax rate increases the probability that the incumbent government is re-elected, but that it is not statistically significant, whereas the effective tax rate has a weak but significant relationship. However, the marginal tax rates do not affect the chances of re-election.

Part of the literature on whether taxes affect re-election prospects focuses on single-country studies by incorporating 'yardstick competition', i.e., voters compare the tax system with neighbouring areas before casting their votes. The argument put forward by Besley and Case (1995) is that, in the absence of symmetric information between voters and politicians, voters use the performance of their area compared to a similar area to decide whether or not to vote for the incumbent government. Besley and Case analyse the effects of different types of taxes such as sales tax, income tax, corporate tax and total tax on US governors' chances of re-election. Over the period 1950-86 they conclude that an increase in own state tax is positively correlated with a governor's chance of re-election, while a negative effect exists for tax

increases in the neighbouring states. Thus, state governors who achieve better economic performance compared to neighbouring states have a greater chance of re-election.

Using data for English districts, Revelli (2002) examines whether tax-setting policies, including those of the neighbours, affect local election results over 1979-90. The main tax variable used is the local property tax rate, and the dependent variable is the share of vote received by the incumbent party at an election. Using the Generalised Method of Moments, Revelli concludes that there is a significant negative effect of own taxes on the share of vote of the incumbent, while the neighbours' taxes have a small positive impact of this, so that this is a different result to that of Besley and Case (1995), as discussed above.

Besides conducting single-country analysis for the US and UK, some studies have focused on single-country analyses for the other EU Member States. Bosch and Solé-Ollé (2007) estimate the effects of own and neighbours' tax rates on the election outcomes for Spanish municipalities. This is similar to the study of Revelli (2002), in that the neighbouring tax rates are taken into account. The sample dataset consists of the property tax and vote share of the parties as dependent variable over 1991-2003. Unlike the above-mentioned studies, Bosch and Solé-Ollé take account of ideological preferences to examine the effects of the property tax on voting. They find that the own tax has a negative effect on votes, but the neighbours' tax has a positive effect, so that the vote share is influenced by the relative property tax increase. Bosch and Solé-Ollé show that under a right-wing government there is a negative and significant effect of the own tax on votes, but it is insignificant for a left-wing government. A neighbour's taxes have a significant, positive relationship under both governments.

Van Malderen and Gérard (2013) investigate whether the local incumbents mimic each other's tax rates since they do not want to be penalised for higher tax rates compared to neighbouring areas. This is for the Walloon Region of Belgium in 2012, and two types of tax surcharge: on income and property. They show neighbouring tax rates influence the voters in sanctioning the incumbents, which is a different finding to Bosch and Solé-Ollé (2007). Van Malderen and Gérard further suggest that the local incumbents do not have to mimic each other for fear of electoral punishment. Using data on property tax rates for the Italian municipalities over the period 1995 to 2004, Padovano and Petrarca (2014) investigate whether the fiscal decisions of the mayors affect their re-election probability, and whether the incumbent mayors consider the fiscal decisions of the other mayors. Consequently, they estimate a vote popularity equation for the first of these and a tax-setting equation for the second. They conclude that an increase in the tax rate leads to a fall in the popularity of the incumbent mayor, and that the mayors do take into account the tax rates that are set in the neighbouring municipalities.

While the above-mentioned studies focus on the geographical neighbour when analysing whether tax changes affect re-election chances, an interesting contribution is made by Dubois and Paty (2010), who consider neighbouring cities with similar demographic characteristics. Using local housing tax for France over 1989 to 2001, they find that voters punish the incumbents for high own housing tax rates. There is evidence that the voters penalise the incumbent government if the own local housing tax is high. In addition, the findings also indicate that the voters consider the housing tax rates in the neighbouring cities. As such, if these neighbouring cities have a high local tax rate, then the voters are likely to reward the incumbent government. Overall, in the context of the single-country studies, it can be seen that voters punish the incumbent for an increase in taxation, and conversely. With regards to the 'yardstick competition', the studies find that voters take into account both their own and neighbouring fiscal policies when sanctioning their own incumbents at election.

2.6.1.2 *Multi-Country Studies*

Besides focusing on a single country, the literature also includes studies that focus on the electoral effects of fiscal instruments in a cross-country setting. Using changes in income tax rates, Tillman and Park (2009) evaluate if they affect electoral outcomes in 19 OECD countries over the period 1990-2006. The results reveal that an increase in the basic income tax rate leads to a decrease the share of the government's vote. They further find that this depends on an incumbent's ideology, but while there is no significant evidence of left-wing government being penalised for an increase in the income tax rate, the voters punish right-wing governments. These results hold when the basic income tax rate is used, but there is no evidence to support the top marginal income tax rate changes impacting on the government's share of votes. This may be because changes in the basic income tax rate affect all taxpayers, whereas only a relatively small proportion of taxpayers are affected by changes in the top rate.

Steiner (2010) tests whether international economic integration influences the implementation of fiscal instruments and how this affects the electoral turnout. He uses a sample of 23 OECD democracies over 1965-2006, and finds that voters are aware that economic integration constrains fiscal instruments, but that they take this into account when casting their votes in national elections. Steiner concludes that there is a positive relationship between total public spending as a percentage of GDP and the election result. This is in line with Hobolt and Klemmensen (2006), who find that as government spending on education and social capital increases, more voters turn out to vote, so that this indirectly influences its re-election prospects.

Focusing on 20 established developed countries from 1972 to 1999, Katsimi and Sarantides (2015) contribute to the literature by examining how national public investment is a mechanism for influencing voting behaviour and re-election prospects. They find that voters reward incumbents for an increase in public investment during the incumbents' term in office, but that there is no significant evidence that an election-year manipulation of public investment has an effect on the incumbents' re-election prospects. Katsimi and Sarantides include government revenue as a control variable, but it does not affect the re-election prospects. Overall, regarding the multi-country studies on the electoral effect of fiscal instruments, the studies reviewed show that an electoral manipulation of the fiscal instruments will impact on the incumbent's electoral prospects. In particular, voters are likely to reward an incumbent government for increases in government spending and to penalise them for tax increases. Overall, there are relatively few studies that look at multi-country analysis, and in particular for the EU as a group of countries.

2.6.2 *Re-Elections in Developing Countries*

This section focuses on the empirical evidence of the effects of fiscal instruments on re-election prospects in developing countries. While there are studies that have been carried out in the context of OECD and EU countries, there have been relatively few for developing countries. Table 2.4 summaries this literature on re-election prospects in developing countries, which I refer to below.

Research on whether changes in fiscal instruments affect re-election prospects in developing countries is limited. Del Granado *et al.* (2008) tests if the re-election outcomes are affected by whether voters have access to information on the tax rates applied in neighbouring jurisdictions. This is for Indonesia for the year 2004. Due to a lack of information on voting, they use survey data to construct their dependent variable, which is the percentage of respondents who are 'satisfied' or otherwise with government services. A response of 'satisfied' implies that the respondent will vote 'yes' for the incumbent mayor, but a response of 'quite satisfied' or 'not satisfied' implies that the respondent will not. Further, since data for other district tax rates are not available, Del Granado *et al.* use proxies such as the own revenue as a percentage of real GDP, own revenue per capita and own revenue as a share of total revenue. They find that there is a negative relationship between the popularity of a mayor and the own tax rate, and that the popularity increases with the neighbours' tax rates.

Table 2.4: Re-Elections in Developing Countries

Author	Country	Year	Main Findings
Brender and Drazen (2008)	74 countries including 23 developed and 51 developing countries.	1960-2003	Voters are more likely to punish incumbent governments when they engage in large budget deficits, while budget surpluses have a positive impact on re-election prospects.
Del Granado *et al.* (2008)	Indonesia	2004	There is evidence of voters punishing the incumbent mayor for increasing own tax rates, but the incumbent mayors' popularity increases with the neighbours' tax rates.
Drazen and Eslava (2010)	Columbian municipalities	1992-2000	Voters punish incumbent mayors for running high deficits. There is no significant effect on re-election prospects when current expenditures are increased.
Sakurai and Menezes-Filho (2008)	Brazilian municipalities	1988-2000	There is an increase in the probability of re-election when the incumbent mayors increase spending during their terms in office.

A more comprehensive study is undertaken by Brender and Drazen (2008), which is for 74 countries (23 developed and 51 developing) over 1960-2003. Overall, they find no evidence that an increase in the incumbent's budget deficit affects its re-election chance. However, when focusing on the developed countries only, they find that voters punish the incumbent if electoral spending increases and for tax cuts. In the context of developing Latin American countries, a study by Sakurai and Menezes-Filho (2008) concludes that it is more likely for mayors to be re-elected if capital spending is higher during the years before an election, but in the case of Brazil if current spending increases in the election year. Using local taxes as control variables, over the period 1988-2000 the authors also conclude that the probability of winning elections is higher when local taxes are increased. They mention that this positive relationship can be attributed to the fact that the voters accept the increase in taxes in return of government spending. This is different to most of the existing literature that shows that voters punish incumbents for tax increases.

Focusing on local government spending, Drazen and Eslava (2010) analyse the effect of fiscal policy on vote shares in Columbian municipalities from 1992 to 2000. They find that there is a positive relationship between investment spending and the vote share of the incumbent

party, while a negative relationship exists between the per capita deficit and the vote share. In general, from the above literature review, the majority of the studies have focuses on electoral accountability in the OECD and the EU countries. Very limited research has been undertaken for developing countries, so that from Table 2.4 there is no overwhelming evidence on whether voters sanction the incumbent government for engaging in electoral fiscal manipulations.

2.7 Conclusions

This chapter reviews the theoretical developments and empirical results that underpin the study of the political business cycle. This literature models the political business cycle as politicians that are either opportunistic in their behaviour or ideological in their preferences in relation to the economy. The opportunistic model assumes politicians prefer to manipulate the economy to retain political power rather than to maximise social welfare (Nordhaus, 1975), while the partisan political business cycle focuses on the effect that party ideology has on the economy (Hibbs, 1977). Although these models assume that voters have adaptive expectations, there is mixed support for the two models. Frey and Schneider (1978a) develop an empirical framework that permits the joint analysis of the motivating forces of opportunism and ideology.

Rogoff and Sibert (1988) and Alesina (1987) develop the literature by incorporating rational expectations into the theoretical model of the political business cycle. Rogoff and Sibert argue that there is an information asymmetry between the voters and government, which causes politicians manipulate the economic instruments such as taxes and government spending in order to signal their competence to voters, and hence to secure re-election. As such, the focus is on fiscal instruments rather than economic outcomes. Alesina argues that election outcomes are uncertain, and that the 'shock' caused by this has an effect on the economy until contracts are renegotiated. Many empirical studies have been carried testing these models, i.e., electoral manipulations in fiscal policies, and the chapter has considered these for developed countries in the OECD and EU, and developing countries. Overall, it can be said that there is strong evidence for electoral cycles in government spending in developed countries, but that the evidence for taxation is mixed in the OECD countries, while pre-electoral tax cuts are found in the EU. In the developing countries, there is evidence of electoral cycles in government spending and taxation, perhaps due to weaker institutions.

This chapter also investigates the effect of fiscal policy on the incumbent's re-election prospects. This is a necessary condition for the political budget cycle, since if fiscal instruments are found to have no effect then electoral manipulations are also likely to be ineffective. The empirical studies examine whether voters hold the government responsible for changes in the

fiscal instruments. Overall, in the OECD and EU, the empirical evidence is that voters reward the incumbent for increasing government spending or tax cuts. However, the evidence is much less clear-cut for developing countries given the more limited evidence. A feature of this literature is 'yardstick competition', whereby voters compare their own taxes with that of neighbouring areas to decide on whether to 'sanction' the incumbent. Most studies that consider yardstick competition are for single countries, and the evidence is that the voters compare the tax rates of their area with that of the neighbouring areas when casting their vote.

Overall, there is a range of support in the literature that electoral cycles are present in fiscal instruments, and that voters sanction the incumbent for changes in the fiscal instruments. The majority of these studies have focused on examining the electoral effects on government spending and budget deficits. Although there are some empirical studies on the electoral effects on taxation, the focus is mainly on tax indicators, such as total tax collection rather than effective tax rate. The effective income tax rate, which is used in this thesis, is advantageous as it expresses the percentage of income each taxpayer (group) actually pays in taxes. Other than purely partisan effects, what also is clear from the literature review is that there is a gap in understanding on whether the incumbent government is likely to target particular groups in the electorate to increase its re-election prospects. These issues are the focus of my analysis in the subsequent chapters of the thesis.

Chapter 3. Duration on Electoral Terms in the European Union

3.1 Introduction

Political parties have an intrinsic function in modern democracies, where free and fair elections take place, since they are the key players in the formation of a government as well as the policy-making process (Harfst, 2013; Andersen *et al.*, 2014). As such, ultimately countries are faced with the important task of how to choose and how implement an electoral system, as this is the mechanism by which political parties are elected, and that in turn is responsible for monitoring the legislative acts of the country (Rae, 1967). Therefore, the electoral system is fundamental to any political society as it is the method used by democratic countries to calculate the number of elected positions in the government and to choose its 'rightful' representatives (Horowitz, 2003).

The electoral systems used in Europe experienced several transformations during the 19th and early 20th centuries. Initially, the 'majoritarian electoral system' was predominantly used in the European democracies. This is the system under which either the political party or the candidate who receives the most votes is declared the winner (Bormann and Golder, 2013). However, with the move towards modern democracy, countries have experimented with different electoral systems. It includes the 'proportional representation electoral system' that was introduced by some countries after the Second World War, under which the allocation of seats is proportional to the votes that are cast (Ahmed, 2010). Usually, this also involves a quota (i.e., a minimum number of votes) necessary in order to declare the political party or candidate a winner. Another possibility is the 'mixed electoral system' that combines the majoritarian and proportional representation electoral systems (see Bormann and Golder, 2013). Under this, electors have two votes, one for a candidate in a constituency and one for a national party list that is decided under proportional representation.

Although the different electoral systems are crucial in determining the vote share for an electoral outcome and to form a government, this does not guarantee the duration of the government in office. According to Stepan and Skach (1993), democratic countries have institutional frameworks that are related to the formation of governments, the conditions under which a country may continue to rule and the conditions that determined when governments can be terminated. Elections usually take place at a constitutionally fixed term, however, there are governments that do not complete their term in office, leading to unexpected termination of the government and early call for election. The purpose of this chapter is to explain the three

factors that determine the duration of an electoral term, and these are self-interest motives, coalition collapse and stochastic events. The chapter differentiates between pre-determined and early elections, where the timing of the latter may be freely determined by the incumbent or Parliament, so that electoral terms may be of different lengths. This is important for the subsequent analysis since when the election date is known with certainty in advance then an incumbent government has time to manipulate the fiscal instruments or economy in order to increase its vote share, unlike when the election is called unexpectedly (Shi and Svensson, 2006).

The next section provides some context and discussion of the European Union, and in particular the process of EU enlargement, whereby the emerging democracies of Central and Eastern European Countries (CEECs) integrated into the EU in the mid-2000s. The duration of the electoral term is also examined for each EU country in Section 3.3, which is required for the empirical exploration of electoral cycles. Conclusions are drawn in Section 3.4.

3.2 The European Union

The European Economic Community (EEC) was founded in 1957 by six countries, Belgium, France, Germany, Italy, Luxembourg and the Netherlands. Denmark, Ireland and the United Kingdom joined the EEC in the first round of enlargement that took place between 1970 and 1979. Between 1980 and 1989, Greece joined in a second enlargement, followed by Spain and Portugal in a third enlargement, and Austria, Finland and Sweden in a fourth enlargement in 1995, as shown in Table 3.1. The journey towards further enlargement of the European Union had began with the fall of the Berlin Wall in 1989 that led to the collapse of the communist system in the Central and Eastern European Countries (CEECs). On 7 February 1992, the then twelve countries of the EEC signed the *Maastricht Treaty*, leading to further enlargement in West Europe and the eventual membership of the CEECs in the mid-2000s. The main objective of the treaty was to align these countries with respect to the economic and monetary union. The implication of this is that the member countries had to abide by fiscal rules through what was known as the Excessive Deficit Procedure (EDP). Under this, member countries could not run government deficits of more than 3 percent of GDP and debt of more than 60 percent of GDP. Countries within these limits were said to 'avoid excessive deficits'. According to Von Hagen (2006), to make sure that the EDP rules were not influenced by any creative accounting and data manipulation, all member countries had to adopt the same public sector accounting rules.

Table 3.1: European Union and Eurozone Membership Dates

Country	Year entered the European Union	Year entered the Eurozone
Original Members:		
Belgium	1958	1999
France	1958	1999
Germany	1958	1999
Italy	1958	1999
Luxembourg	1958	1999
Netherlands	1958	1999
First Enlargement:		
Denmark	1973	-
Ireland	1973	1999
UK	1973	-
Second Enlargement:		
Greece	1981	2001
Third Enlargement:		
Portugal	1986	1999
Spain	1986	1999
Fourth Enlargement:		
Austria	1995	1999
Finland	1995	1999
Sweden	1995	-
Fifth Enlargement:		
Czech Republic	2004	-
Cyprus	2004	2008
Estonia	2004	2011
Hungary	2004	-
Latvia	2004	2014
Lithuania	2004	2015
Malta	2004	2008
Poland	2004	-
Slovakia	2004	2009
Slovenia	2004	2007
Bulgaria	2007	-
Romania	2007	-
Sixth Enlargement:		
Croatia	2013	-

Source: Author's own construction for the EU28 countries.
Note: EU includes predecessors of EEC (up to 1992).

The CEECs had to abide by five criteria, known as the Maastricht convergence criteria, relating to the inflation rate, interest rate, exchange rate stability, government budget deficit and the government debt-to-GDP ratio. The EEC was renamed as the European Community (EC) in November 1993, when the *Maastricht Treaty* came in force. In 1997 the Stability and Growth Pact (SGP) provided a framework to ensure fiscal discipline, and in 1998 the European Central Bank was set up with the aim of coordinating the monetary policy and managing the foreign

exchange reserves of the Eurozone, which was created in 1999. This also involved the creation of the European Economic and Monetary Union (EMU), which involves harmonising fiscal policies, a common monetary policy of the EU economies and the creation of a single European currency. However, it was only in 2002 that the Euro currency was introduced as a legal tender. However, not all EU members are part of the EMU and so do not adopt the Euro, although all current and future members are committed to adopting the Euro (the exceptions are the UK and Denmark, with the latter is pegged to the Euro). Where relevant, Table 3.1 shows the year each country adopted the Euro, which was formally launched on 1 January 1999.

Under the SGP, members of the Eurozone have to submit reports on their fiscal policies and budget planning to make sure they are within the government debt limits. The SGP strengthened and modified the EDP by setting a warning system for the public finances, and so acting as a surveillance of the national public finances. It also clarified the sanctions to be imposed upon the breach of national deficit and debt limits. Membership of the EU involves joining the Single European Market under the Single European Act, which involves the free movement of goods, services, labour and capital (Bevan and Estrin, 2004).

In an historic expansion, the fifth enlargement of the European Union (EU) took place in 2004 with eight CEECs (the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia) joining the existing EU countries, along with Cyprus and Malta, while two further CEECs (Bulgaria and Romania) joined in 2007, thus leading to the union of 27 EU countries. In 2009 under the *Treaty of Lisbon*, the EC was dissolved into the EU. In 2013, Croatia was the latest EU member to join, so that to date, the EU had 28 member countries. As noted, Table 3.1 shows the year that each country has acceded. Of course, more recently, the UK has exited the EU under 'Brexit', so that the EU again now consists of 27 members.

In general, fiscal instruments are used to stabilize business cycles. Although the fiscal policy of the EU members is constrained by the convergence criteria of the Maastricht Treaty and SGP, governments can still use fiscal policy as a tool to influence voters in the run-up to an election. The empirical evidence in relation to the SGP was discussed at length in Section 2.5.1.2. The rules of the SGP are used as a tool to coordinate the fiscal policies among the members. The data that are used in this thesis consist of annual data over 1996-2016 for 26 EU Member States, i.e., the 'EU26'. These are all of the members of this union at 2016, except for Croatia and Cyprus, but including the UK. Croatia did not accede to the EU until the sixth enlargement towards the end of the study period in 2013, while taxation data are not available for Cyprus, but this is a relatively small island economy. Consequently, in the next section, I present a discussion of the electoral systems for this group of EU26 countries.

3.3 Types of Electoral System in the EU26 member countries

This section introduces and explains the different types of electoral system that are used by the member countries of the European Union (and its predecessor organisations). The three main types of electoral systems used by the EU26 are the majoritarian system, the proportional representation system and the mixed system. To help structure the discussion, a simple list of these systems is given in Table 3.2, which can be referred to. The period covered is 1996 to 2016

Table 3.2: Classification of Different Electoral Systems

1. Majoritarian System	2. Proportional Representation System	3. Mixed Systems
(a) Plurality System (First-Past-The-Post System)	(c) Single Transferable Vote System	(e) Mixed Member Proportional System
(b) Absolute Majority System (Second Ballot System and Alternative Voting System)	(d) Party-List Proportional Representation System (Open-List and Closed-List)	(f) Parallel System

The majoritarian electoral system is considered to be one of the oldest and simplest systems (Norris, 1997; Farmani and Jafari, 2016). The majoritarian electoral system can be classified into two main categories. First, the *plurality system*, where the candidate that obtains most votes than any other is elected, although it is not necessary that the candidate wins an absolute majority of the votes, and second, the *absolute majority system*, where it is required that the winning candidate wins an absolute majority, usually over 50 per cent. An example of the plurality electoral system is the *First-Past-The-Post* (*FPTP*) system, and examples of the absolute-majority system are the *second ballot* and *alternative voting systems* (Lijphart, 1994; Blais and Massicote, 1997).

These three types of majoritarian electoral system (i.e., FPTP, second ballot and alternative vote) are used in the country-level elections of EU members. *FPTP* is when the candidate that receives the most votes is declared the winner and where no minimum threshold of votes is required, so that the winner may not get a majority of the votes cast (Blais, 2008). *Second-ballot*, which is also known as the 'two-round' system, is a form of absolute-majority electoral system. As the name suggests, countries that adopt a two-round system have elections taking place in two rounds. In most cases the first round of the election is similar to that of a plurality system. If, however, there is no elected candidate in the first round, perhaps because they do not get an overall majority, then a second round takes place. The second round is a run-off between the two candidates that receive most votes in the first round (Rottwilm, 2016). In the second round, the candidate receiving the most votes is declared the winner, so that it produces an absolute majority (i.e., more than 50 percent of the votes cast). *Alternative vote* is the third form of majoritarian electoral system, where the voters rank each candidate in order of preference (Farrell, 2011). Voters can choose their first preference and can also choose to rank as many or as few other candidates as they prefer. Only the UK and France, which form part of the West EU have adopted the majoritarian electoral system. More specifically the UK uses the FPTP, while France uses the two-round system.

The second main type of electoral system is proportional representation. This system is one where the seat distribution corresponds directly to the proportion of the total votes cast for each party (Bogdanor, 1984; Norris, 1997). For instance, if a party wins 45% of the vote share, then it gets 45% of the parliamentary seats. In the context of the EU member states, the proportional representation system can be divided into two categories, namely the *Single Transferable Vote* (*STV*) and the *party-list proportional representation system*. These are used where constituencies elect more than one representative as compared to the majoritarian system, which is a single-member constituency approach. *STV* is a form of the proportional representation system where voters have to rank the political candidates from the same party or different parties (Tideman, 1995). Under this, each voter ranks candidates in the order of preference. Ireland and Malta are the two West EU countries to have adopted the STV electoral system. Another form of proportional representation electoral system that is used by some of the EU26 member countries is the *party-list proportional representation system*. It also aims to provide proportionality between the parliamentary seats and the share of the vote casts for each political party. It uses a party list, whereas STV is a candidate-based system. Similar to STV, a constituency has many seats under the party-list system, although there are two main ways of implementing it, as the party list can either be open or closed. In both cases, each party presents a list of candidates and the order in which the candidates are presented in the party list

is fixed within the parties. Under the open-list system, the voters choose a favoured candidate and the votes are used to determined which candidate wins a seat in the parliament. The majority of the West EU countries (Austria, Belgium, Denmark, Finland, Luxembourg, Netherlands and Sweden) use the open-list version of this electoral system, where voters are able to choose both their preferred party and preferred candidate within the party. Some of the CEECs such as Bulgaria, Czech Republic, Estonia, Latvia, Poland and Slovenia also use the open-list proportional representation electoral system. Under the closed-list system, the voters choose between a favoured candidate list presented by each party, that is, they mark their vote next to the name of the party that they support. If a particular party wins three seats in a constituency, for example, then the first three candidates in the party list are elected. Along in the West EU (Greece, Portugal and Spain), some of the CEECs such as Romania and Slovakia use a closed party-list.

A mixed electoral system is a combination of the majoritarian (or some other system) and the proportional representation electoral systems (Massicotte and Blais, 1999). In fact, depending on the electoral system used, voters can cast two votes. There are two main forms of the mixed system: the *Mixed Member Proportional* (*MMP*) *system* and the *parallel system*. The *MMP system* distributes parliamentary seats using majoritarian and proportional representation electoral systems, where the latter is used to reduce any disproportional seat allocation under the former (Hix *et al.*, 2010). Each voter casts two votes: one for a candidate in single-member constituency election and one for a party list in a multi-member constituency (Scarrow, 2001). In other words, under the MMP system, the voters can choose which candidate is elected and they have an influence on which political party to elect. The other form of a mixed electoral system is the *parallel system*. Similar to the MMP system, the parallel system uses a combination of majoritarian and proportional representation electoral systems to distribute the parliamentary seats, but unlike this other system it does not use proportional representation to compensate for any disproportionality that arises from the majoritarian system (Reynolds *et al.*, 2008). Under the parallel system, the seats obtained under the majoritarian system is added to the number of seats obtained under the proportional representation system. As such, there is no link between the majoritarian and proportional representation systems. Both the West EU (Germany and Italy) and the CEECs (Hungary and Lithuania) have adopted the mixed electoral system.

In general, both the West and the CEEC countries have adopted the proportional representation electoral systems, more specifically the open-list systems. The CEECs, however, have undergone numerous changes to their electoral systems and hence have been relatively less stable than the electoral systems in the West.

3.4 The Duration of Electoral Terms

Competitive elections play an important role in democratic countries, since it is a mechanism that constrains government behaviour to maximise social welfare and to give importance to the preference of the citizens of a country. However, while it is expected that elections occur at a regular interval, that is, the timing of elections are fixed, this is not always the case, so that the governments do not always complete their full-term time in office. In practice, it is possible to differentiate between pre-determined and early elections. This is important since it is likely to determine the existence and nature of a political business cycle. According to Rogoff (1990), the incumbent government has enough time to manipulate the fiscal policy to increase its re-election chances when the election date is pre-determined compared to when the elections are called unexpectedly. It is therefore important to consider the issue of early elections.

Laver (2003) distinguishes between the 'political duration' and the 'political durability' of a government. Political duration represents the empirical record of the length of time that a government is in office, but political durability is a theoretical term that is explained by the causes that affect the duration of a government. While it is not possible to forecast the duration of a government, Laver (2003) argues that it is possible to model its durability. In this thesis, it is important to differentiate the factors that affect the duration of the government, that is, why some governments terminate before the end of their term. There are various reasons for this, including the collapse of a coalition, no-confidence votes, the voluntary resignation of the government and even the death of cabinet members. This section concentrates on the reasons why governments call early elections, focusing on the EU26 countries.

Table 3.3: The Pattern and Reasons for General Elections in West EU Countries

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Malta	Netherlands	Portugal	Spain	Sweden	UK
1996							SE		CC		NE			CC		
1997					NE			NE								NE
1998			NE			NE					CC	NE			NE	
1999	NE	NE		NE						NE			NE			
2000							NE							NE		
2001			NE						NE							SE
2002	CC				NE	NE		NE				NE	SI		NE	
2003		NE		NE							NE	CC				
2004							NE			NE				NE		
2005			SI			NE							SI			NE
2006	NE								NE			CC			NE	
2007		NE	SI	NE	NE		NE	NE								
2008	CC								CC		NE			NE		
2009						NE	SE			NE			NE			
2010		CC										CC			NE	NE
2011			NE	NE				SE					SE	NE		
2012					NE		SE					CC				
2013	NE					NE			SE	SE	NE					
2014		NE													NE	
2015			NE	NE			SE						NE	NE		NE
2016								NE						CC		

Key: NE = Normal Expiry. Early terminations as follows: SI = Self-Interest; CC = Coalition Collapse; and SE = Stochastic Events.
Source: Information on the election timing for the EU26 is taken from the website *Inter-Parliamentary Union* (PARLINE, https://data.ipu.org/) and the *Supplement to the Comparative Political Data Set* (Armingeon *et al.*, 2016).

Table 3.4: The Pattern and Reasons for General Elections in CEECs

	Bulgaria	Czech	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia
1996		NE				NE		NE		NE
1997	SE						NE			
1998		SE		NE	CC				NE	
1999			NE							
2000						NE		NE		NE
2001	NE						NE			
2002		NE		NE	NE				NE	
2003			NE							
2004						NE		NE		NE
2005	NE						NE			
2006		NE		NE	NE				CC	
2007			NE				CC			
2008						NE		NE		NE
2009	NE									
2010		NE		NE	NE				NE	
2011			NE		CC		NE			CC
2012						NE		NE	CC	
2013	SE	CC								
2014	CC			NE	CC					CC
2015			NE				NE			
2016						NE		NE	NE	

Key: NE = Normal Expiry. Early terminations as follows: SI = Self-Interest; CC = Coalition Collapse; and SE = Stochastic Events.

Source: Information on the election timing for the EU26 is taken from the website *Inter-Parliamentary Union* (PARLINE, https://data.ipu.org/) and the *Supplement to the Comparative Political Data Set* (Armingeon *et al.*, 2016)

A study by Andersson *et al.* (2014) shows that over the past 73 years around 59% of democratic governments in Europe have ended their parliamentary activities before the end of their scheduled electoral term. In order to understand a government's durability, it is necessary to understand the causes of a government termination leading to an early election. Based on my own research, Tables 3.2 and 3.3 show the reasons why the EU26 member countries call early elections, focusing on the period since 1996. It is taken from the website *Inter-Parliamentary Union* (PARLINE, https://data.ipu.org/) and from the *Supplement to the Comparative Political Data Set* (Armingeon *et al.*, 2016). Table 3.2 is for West EU and Table 3.3 for the CEECs, where the year refers to when the election is held. Overall, most of the elections, across the EU26 member countries take place following the normal expiry date. More specifically, out of the 143 elections across the EU26 member countries, 105 (73%) take place as a result of the normal expiry term. Out of these 105 pre-determined elections, 60 take place in the West EU and 45 in the CEECs. The remaining elections take place outside of the normal expiry date, and the tables show that there are three broad reasons why the EU26 member countries called early elections: self-interest, coalition collapse and stochastic events outside the government's control. These are now each considered.

3.4.1 *Self-Interest*

Most of the parliamentary democracies do not follow the fixed timing of elections as incumbent governments have control, to some extent, on the occurrence of elections. According to studies such as Smith (2003) and Kayser (2006), economic conditions affect the government duration and in particular its term in office. Thus, incumbent governments will evaluate their political prospects using economic and political indicators. This may be as a result of opinion sampling, both from opinion polls and privately commissioned focus groups. Thus, an incumbent may choose to bring forward the timing of elections when the economic and/or political conditions are favourable in an attempt to influence voters' choices, or conversely put-off the election date when these conditions are not favourable. Of course, this relies on the incumbent government having the power to control the election date, leading to it determining the election date in its own self-interest and when it is most favourable for its re-election chances.

Much of the existing literature shows that incumbents time elections to their advantage to increase their chances of being re-elected. This gives rise to opportunistic election calling. According to Smith (2003), some governments tend to call early elections when they are less confident about their performance as the early election is a way to gain voters' support based

on the past successes of the governments. Regarding the elections used in this thesis, there are some early elections that have been called due to the economic conditions of the country, which suggests self-interest on the part of the incumbent. It can be seen from Tables 3.3 and 3.4 that most early elections due to self-interest are in the West EU. In Denmark, the early elections in 2005 and 2007 took place following a time of economic growth and a sound performance. In 2002, the then government lost the local elections in Portugal and decided to call for an early general election, while the early election in 2005 was due to the resignation of the then Prime Minister, who submitted his candidature for the office of President.

3.4.2 *Coalition Collapse*

Coalition collapse that impacts on the stability of the government can also influence the timing of elections. Not all government types respond to economic and political challenges in the same way. For instance, a single-party government can potentially deal with economic changes much better than coalition governments because they do not have to consult with other parties and obtain their agreement. Usually, coalition collapse follows a vote of no confidence, which shows that the majority of the party do not support the decision of the party leader. However, the termination can also arise from disagreement between the members of the coalition party.

Research by Lowell (1896) shows that governments of a single-party are more stable than coalition governments, so coalition governments are more likely to be subject to premature parliamentary dissolution. In their study, Taylor and Herman (1971) establish a relationship between the durability of a government and the features of a party system, such as the number of parties in government and opposition, and minority and majority governments. Across 196 governments in a sample of 19 OECD countries, they find that there is a positive relationship between the number of parties represented in parliament and a government's early termination. Likewise, for 29 European countries, Andersson *et al.* (2014) finds that minority governments and coalition governments tend to have early terminations of elections.

From Table 3.3, it can be seen that Austria, Belgium, Italy, Malta, Netherlands and Spain are the main countries that have had early elections due to coalition collapse. In 2002, the governing coalition party broke up, which led to an early election in Austria. In 2008, since the coalition government had different views regarding some fiscal policies, the collapse of the government triggered early elections. The 2010 election in Belgium was caused by a prolonged political crisis leading to the collapse of the coalition government. In Italy, a lack of legislative support led to the collapse of the coalition government and an early election in 1996. In 2008,

the withdrawal of a member from the governing coalition led to the triggering an early election. The governing party lost its parliamentary majority of one seat following a protest against some of policies implemented by the government, causing an early election in 1998 in Malta. In the Netherlands, four elections were caused by the collapse of the coalition government: in 2003 by the resignation of the Prime Minister; 2006 by the withdrawal of a coalition party; 2010 from disagreement among coalition parties regarding pension reform and public spending; and 2012 when a coalition party did not support the government's austerity package. In Spain, the 1996 and 2016 elections were caused by the coalition collapse of the governing party.

Table 3.4 shows that early elections in the CEECs were caused by coalition collapse. In Bulgaria, the 2014 election took place following the resignation of the then Prime Minister, who announced he would quit politics. The coalition government lost a vote of confidence over alleged corruption scandals in Czech Republic, leading to the collapse of the government and an early election in 2013. The 1998, 2011 and 2014 early elections in Latvia were as a result of a coalition collapse. The coalition government in Poland experienced some tensions, which led to the collapse of the government and an early election in 2007. The early elections in 2006 and 2012 in Slovakia and 2011 and 2014 Slovenia were also the result of a coalition collapse. Overall, from Tables 3.3 and 3.4, it can be seen that early elections due to the collapse of the coalition government are prevalent in both the West EU countries and the CEECs.

3.4.3 *Stochastic Events*

Another strand of the literature has shown that stochastic events may disrupt the durability of a government (Frendreis *et al.*, 1986; Cioffi-Revilla, 1984). These stochastic events can take the form of severe economic decline, wars, corruption scandals or even the death of the Prime Minister. It suggests that early government terminations can occur due to wholly unpredictable events that are outside the direct control of the governing parties, and this supported by others, such as Warwick (1994) and Laver (2003). Over the period 1996-2016, it is clear from Tables 3.3 and 3.4 that a number of EU26 country elections took place earlier than the constitutionally fixed election term due to these stochastic events. These can be listed as follows.

Some countries have called early election due to either changes in their electoral system or in their constitutional law. For instance, in 1999, there was an announcement regarding the amendment of a Constitution in Belgium, which led to an early election. Due to political pressure, there was an early election in Denmark in 2001. The poor health of the PM in Greece in 1996 was the unexpected cause of an early election, where a snap election was called in order

to allow the government to renew its mandate. Following the publication of a new decree, Netherlands had to call an early election in 2006. The 2008 Financial Crisis is also part of the stochastic events, and several election timings were affected. The 2011 election announcement in Denmark occurred a few days after the then government presented an economic package to prevent bankruptcy due to the 2008 crisis. The early 2009 election was mainly due to the PM's argument that a new mandate was needed to help to take Greece out of the crisis. Greece again called early elections in May 2012, but no party won a majority, leading to a second round of elections in June. The on-going economic crisis led to further two snap elections in 2015. The premature 2011 elections in Ireland was also influenced by the Financial Crisis. In 2011, the Portuguese government's austerity plans were rejected, leading to the resignation of the PM and the early dissolution of the government. Finally, elections can also be postponed following an unexpected event, which was the case for the 2001 elections in the UK due to the spread of foot-and-mouth disease impacting on the agriculture industry.

Furthermore, events such as strikes and demonstrations against the government can be considered as stochastic events that lead to premature and unexpected government dissolution. In 1997, the Bulgarian government had to call for early elections due to strikes and protests against the government. A second election in 2013 was called earlier than the constitutionally set date, and this was followed by nationwide protests against the expansionary fiscal policies implemented by the government. The 1998 election in the Czech Republic and 2006 election in Italy took place after a change in the constitutional and electoral laws respectively. One example of a political scandal leading to an early election is the 2011 election in Latvia, where the leader of the opposition was accused of corruption. However, the parliament did not give the prosecutors permission to investigate the opposition leader, so that this led to the President of Latvia proposing the premature dissolution of parliament to fight corruption.

3.5 Conclusions

Important conclusions can be drawn from the in-depth discussion in this chapter on the electoral systems and the early government terminations in the EU26 countries of West EU and CEECs. In the former case, the chapter identifies three main electoral systems, of which there are several sub-categories. These are as follows: i. Majoritarian system (plurality and absolute majority), ii. Proportional Representation system (single transferable vote and party-list proportional), and iii. Mixed system (mixed member proportional and parallel).

The discussion in this chapter shows that the majority of the EU26 countries have adopted the list proportional representation system. In the West EU, the majority of the member countries have adopted the proportional representation system, with 10 countries using theist proportional system and two countries using the single transferable vote. The remaining four countries form part of the majoritarian systems and the mixed member electoral systems. For the CEECs, the chapter shows that the electoral system used during the communist period was the absolute majority systems, with voters having no choice of candidate. However, since the collapse of communism there have been a number of changes to the electoral systems of the CEECs as they have transitioned into more democratic economies and sought to find a stable form of electoral system to where now the electoral processes within the East and the West EU are relatively similar. As such, similar to the West EU, the Central and Eastern Europe Countries (CEECs) have also adopted the proportional representation system. Of the ten CEECs, eight have adopted the ist proportional representation and the remaining three have mixed electoral systems with some elements of proportional systems. Overall, in both the West EU and CEECs, the proportional representation electoral system is more popular compared to the other systems.

Usually, an election takes place at a constitutionally-fixed time interval and this can be considered as a 'pre-determined' election. When the election date is pre-determined then the incumbent government has enough time to implement expansionary fiscal policies in an attempt to increase its re-election chances. However, the election date may not be pre-determined, and there may be instances where an election takes place outside of a constitutionally-fixed interval. The chapter indicates three possible reasons why this may occur, arising from self-interest, coalition collapse and stochastic events. Over the period 1996-2016, there were 143 general elections in the EU26 countries, of which 105 elections (73%) took place at the normal expiry of the government time in office. The other 38 elections occurred early due mainly to coalition collapse. Of the 105 elections, approximately 57% are considered as pre-determined elections in the West EU and approximately 43% in the CEECs. The different government terminations mean it is possible to examine whether the results differ when the elections are pre-determined, since these give the incumbent government ample time to engage in electoral manipulations of fiscal policies in an attempt to influence voters on its side.

Chapter 4. Methodology and Data Collection

4.1 Introduction

The purpose of this chapter is to introduce and outline the methodology that is used to analyse the relationship between taxation and electoral cycles in the EU. The thesis has three specific research aims as follows by examining: whether governments engage in electoral manipulations of the average income tax rate for particular groups of voters and how this differs by ideology; if election-year changes in the average income tax for different groups influences the vote share of the incumbent governments in the EU26; and if incumbent governments can fool the voters repeatedly by manipulating average income tax rates for consecutive electoral terms.

A main contribution of the thesis is to examine data on the average tax rate for different household groups in the EU26 member countries. Previous studies using taxation have mainly used tax revenue as a percentage of Gross Domestic Product, but in this thesis the focus is on the net Personal Average Tax Rates (PATR) that has the advantage of capturing the tax burden of personal income taxpayers. The net Personal Average Tax Rate (PATR), which is available for different groups of households and it has the advantage of being able to analyse whether incumbent governments target particular groups of voters based on the household characteristics of these groups. The use of the PATR for different household groups therefore provides an important contribution to the literature on the PBC. An important consideration of the methodology is therefore an explanation of this measurement of taxation that is used in the subsequent empirical chapters.

To investigate the effect of the electoral cycles a panel data set for the EU26 member countries over the period 1996-2016 is used. This chapter gives a description of the variables in this dataset, which include the dependent variables relating to the different analyses as well as the independent variables. The dependent variables reflect the main objectives of this thesis, which is whether electoral manipulations are present in the average income tax rate and whether these manipulations help to increase the vote share of the incumbent government. In the case of the former, the dependent variable is the net Personal Average Tax Rate, as discussed above, and for the latter it is the vote share of the incumbent EU26 governments. The independent variables are classified as either political variables or socio-economic variables. They have been chosen based on their conventional use in the PBC literature, and for their importance in testing whether there is a relationship between tax policy setting and elections. Further, the chapter also provides a detailed discussion of the different econometric techniques that are used

to analyse the above hypotheses, with these being the Fixed Effects, the Generalised Method of Moments and the Quasi-Maximum Likelihood Estimator estimators.

The structure of the chapter is as follows. In the next section, the chapter introduces the research contributions of this thesis, so that the empirical approaches used to analyse these are discussed in Section 4.3. The description of the net Personal Average Tax Rate variable and the different household types are discussed in Section 4.4. The vote share variable is explained in Section 4.5. The independent variables are then introduced, with Section 4.6 describing the election variables, Section 4.7 the political variables and Section 4.8 the socio-economic control variables. Finally, Section 4.9 concludes this chapter.

4.2 Research Contributions

This section explains the research aims of the thesis, which seeks to make contributions around three broad issues that are analysed in the subsequent chapters:

1. Does the government engage in electoral manipulations of the average income tax rate for particular groups of voters in the EU26, and how does this vary by ideology?
2. Do election-year changes in the average income tax rates for different household groups influence the vote share of the incumbent government in the EU26?
3. Can the incumbent government fool the voters repeatedly by manipulating the average income tax rates if it is in office for consecutive electoral terms?

The central theme across the three research questions is the relationship between taxation and electoral cycles, so as a first step it is important to establish the indicator of the tax system that is relevant to voters. The main fiscal indicator that is widely used in the existing literature of political budget cycles is overall tax revenues. However, a problem with this measure of taxation is that there may be other factors that influence overall tax revenues, for instance, it is possible that a growing economy may inflate tax revenues even though the tax rates remain unchanged. Further, according to Wilensky (1976**)**, individuals are influenced by taxes that are highly visible to them compared to overall tax revenues. In particular, voters are more likely to respond to changes in income tax rates as these directly affect their disposable income. For this reason, a meaningful and consistent indicator of tax policy that is used in this thesis is the effective (or average) income tax rate, which is the tax burden borne (the actual proportion of an individual's income paid in tax) by individuals. In this thesis, the net Personal Average Tax Rate (PATR) is used, which also has the advantage of being available for thirteen household

groups, as explained in Section 4.4 below. The use of the PATRs for the EU26 member countries over the 1996-2016 period is therefore considered as a main contribution to this thesis as it measures the level of taxation directly for a particular group of voters. The PATRs captures the actual proportion of a person's income paid in tax, and it can be considered as a visible indicator of fiscal policy by the voters. A further advantage of using the PATRs is that it gives a more meaningful idea as to how different household groups are affected by the income tax system. More specifically, it may be possible to analyse which household groups are targeted by an incumbent government in the run-up to an election, and how these household groups vote as a result of a change in their tax burden.

The first research question explores whether the government changes the average tax rates that are highly visible to voters in the run-up to elections. As such, the contribution of the first research question lies in addressing whether the incumbent government targets particular household groups in the run-up to elections. From the discussion in Chapter 2, it is expected that the incumbent government is likely to decrease the PATRs in the run-up to an election in an attempt to improve its re-election chances. As such, the incumbent government may target a particular group of voters to secure their votes. Following this, the contribution of the second research question is to examine whether election-year changes in the PATRs for the different household groups affect the vote share of the incumbent government. From the literature review in Chapter 2 it is expected that the incumbent is rewarded for a decrease in the PATRs in the election year. The third aim is based on the first two research questions, but with a focus on an incumbent government that has been in office for consecutive electoral terms. It seeks to find if an incumbent government can fool the voters, whereby if the incumbent is in office for two consecutive election terms do the voters believe the electoral-year manipulations of the PATRs in the second election term? The third research question is explored in Chapter 7, where the variables and methodology used are similar to that of the second research question. Overall, the use of PATRs for the thirteen household groups across the EU26 countries provides a significant contribution to the literature on electoral cycles.

4.3 The Empirical Approach

The purpose of this section is to discuss the estimating equations used to analyse the research questions explored in this thesis. In the empirical literature, the Fixed Effects (FE) and the Generalised Method of Moments (GMM) estimators are used to analyse the effects of elections on the PATRs, while the FE estimator and the Quasi-Maximum Likelihood Estimation (QMLE)

method are used to analyse if the election-year change in the PATRs affects the vote share of incumbent governments. The reason for these different approaches is made clear below.

4.3.1 *The Estimating Equations*

To carry out the empirical test of the electoral effect on average income tax rates for a panel of EU26 countries over the 1996-2016 period in Chapter 5, the following equation is estimated:

$$PATR_{it} = \alpha Election_{i,t} + \beta\big(Election_{i,t} \times Ideology\ of\ Government\big) + \gamma X_{it} + \delta PATR_{i,t-1} + \eta Z_{i,t-1} + \mu_i + u_{i,t}\ , \quad (4.1)$$

where i and t are the EU26 countries and year indicators respectively. $PATR_{it}$ represents the personal average income tax rates for different household groups and the *Election* variable captures the existence of political cycles in the PATRs, that is, the effect of election on the PATRs. Also included in Equation (4.1) is the interaction terms between the election variable and the ideology of the government and these interaction terms capture the opportunistic partisan effects on the PATRs. $X_{i,t}$ captures the political variables covering the ideology of the government, that is, whether the incumbent government is a right-wing or left-wing party and whether the incumbent government is a coalition party. $PATR_{i,t-1}$ is a lagged dependent variable, which is included to control for the persistence in the tax rate over time. Several studies such as Block (2002), Shi and Svensson (2006) and Drazen and Eslava (2010) include the lagged dependent variable as tax rates are persistent in that the current tax rate is determined by the previous tax rate. The control variables are given by $Z_{i,t-1}$ representing a range of socio-economic variables. Similar to Veiga *et al.* (2017), the control variables are lagged by one period to avoid problems of endogeneity. A more detailed description of the variables is given in Sections 4.4 to 4.8. μ_i and $u_{i,t}$ are the country-specific effects and unobserved error term respectively, where country fixed-effects are included to control for institutional heterogeneity across countries.

To analyse the effect of changes in the average income tax rates of different household groups on the vote share of the incumbent parties (second research question) in Chapter 6, the following regression equation is estimated:

$$VS_i^C = \alpha(PATR_{i,t} \times Ideology\ of\ Government) + \beta X_{i,t} + \gamma Previous\ vote_i + \delta Z_{i,t} + \mu_i + u_{i,t}, \quad (4.2)$$

where i and t are the EU26 countries and year indicators respectively. The dependent variable of interest is the current share of votes (VS^C), which is the ratio of the number of votes obtained by the incumbent government to the total number of valid votes in the current election. The interaction variable between $PATR$ and the ideology of the government captures the PATRs under either the right-wing party or left-wing party. $X_{i,t}$ consists of the political variables. The variable $Previous\ vote$ is the vote share of the incumbent government in the previous election and it captures whether governments with greater support tend to perform better at the next election. $Z_{i,t}$ represents the socio-economic variables. Like above, the variables are explained in Sections 4.4 to 4.8. μ_i and $u_{i,t}$ represent the country-specific effect and the unobserved error term respectively, where country fixed-effects control for institutional heterogeneity across countries. It should be noted that in estimating Equation (4.2), although there are 143 elections across the EU26 member countries over the period 1996-2016, the number of observations is 135 in Chapter 6 since the $Previous\ vote$ variable cannot be measured prior to 1996.

Thirdly, the final research question focuses on incumbent governments that have been in power for consecutive terms. As such, Equation (4.2) is estimated again but this time only for the observations where the incumbent is in power for two consecutive terms. The estimating equation, as well as the methodology and variables, used for this third research question are further explained in Chapter 7, and they develop from the analysis of Chapter 6.

4.3.2 *The Estimation Techniques*

The estimation techniques employed for Equations (4.1) and (4.2) vary between a linear and a non-linear estimation, and these techniques are explained in this section. To start with, the Ordinary Least Square (OLS) estimator can be used to estimate Equation (4.1) if it is assumed that the unobserved country-specific effects are the same across countries, but this assumption is unlikely to hold in a large panel of countries as the unobserved country-specific effects are likely to be different across countries (Judson and Owen, 1999). For this reason, the OLS estimator will not be consistent and the Fixed Effects (FE) estimator may instead employed to handle the individual fixed-effects. Given the persistence in the tax rates over time the lagged dependent variable is included in Equation (4.1), but when using the FE estimator the inclusion of the lagged dependent variable may lead to the estimates being biased downwards since by construction the lagged dependent variable is correlated with the error term (Nickell, 1981).

To solve the downward bias of the FE estimator, the Generalised Method of Moments (GMM) estimators for dynamic panel data as developed by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) are used. The first type of GMM estimator is the difference-GMM estimator (Arellano and Bond, 1991), which addresses the bias from the fixed-effects estimator by taking the first differences of Equation (4.1) to remove the individual effects. In this case, it is necessary to find an instrumental variable that is correlated with the new lagged dependent variable from the differenced equation but not with the error term from the differenced equation. The instrumental variable is required as differencing of the equation to remove the fixed-effects leads to a correlation between the lagged dependent variable and the new error term from the differenced equations. According to Arellano and Bond (1991), if it is assumed that the error term in the differenced equation is not serially correlated then it is possible to use the lagged value of the dependent variable from two periods or more as valid instruments for the lagged dependent variable in the differenced equation.

While the difference-GMM estimator should yield consistent estimates, Arellano and Bover (1995) and Blundell and Bond (1998) show that the lagged levels of the explanatory variables are weak instruments for the regression equation in differences. To increase the precision of the estimates they propose combining the difference-GMM with the original regression in levels. As such, the system-GMM estimator extends the difference-GMM by using an additional set of equations in levels with lagged differences as instruments, so that it does not depend upon solely on using the lagged differences as instruments for equations in levels and the lagged levels as instruments for equations in first differences (Bond *et al*., 2001). In the case of persistent series, the system-GMM estimator can outperform the difference-GMM (Arellano and Bover, 1995; Blundell and Bond, 1998). Since the consistency of the difference- and system-GMM estimators depends on the assumption of no serial correlation and on the validity of the instruments, the Arellano-Bond test for second-order serial correlation and the Hansen test for over-identifying restrictions are carried out.

On using the system-GMM estimator, an additional set of instruments are used for the level equation. Since the system-GMM estimator uses more instruments than the difference-GMM estimator, the Difference-in-Hansen test is used to check the validity of the additional instruments. As mentioned in Section 4.3.1, the control variables in Equation (4.1) are lagged by one period and the lagged control variables are considered as exogenous variables. The instruments for the GMM estimator are the lagged dependent variable, the lagged control variables as well as the political variables, X. As such, the number of instruments is equal to the number of regressors. Consequently, zero degrees of freedom are left to calculate the Difference-in-Hansen test and so cannot be performed. Since the Difference-in-Hansen test

cannot be performed, it is not possible to check the validity of the additional instruments for the system-GMM estimator. Although the system-GMM is considered to outperform the difference-GMM, the latter is used to estimate Equation (4.1) but with the results of the system-GMM estimator included in the appendix. Further, despite that the majority of the existing literature on political budget cycle take into account the time fixed effects, in this thesis time fixed effects are not included when implementing the difference-GMM estimator in Chapter 5. This is again because of the number of instruments are equal to the number of coefficients and not enough degrees of freedom are left to carry out the Hansen test for the difference-GMM estimator. The Hansen test examines the validity of the instruments for the difference-GMM, hence if it cannot be calculated the difference-GMM estimator is not considered to be a consistent estimator. A specification including the time fixed effects is, however, included in Appendix Table 5.4.

With regards to the second research question and Equation (4.2), the dependent variable is the vote share received by the incumbent party and therefore measured as a proportion bounded between 0 and 1 so that Equation (4.2) does not satisfy the linearity assumption of the OLS estimator (Kieschnick and McCullough, 2003). If OLS is used to estimate Equation (4.2), then it is likely that the bounded dependent variable will exhibit heteroscedasticity and the predicted values of the OLS are likely to lie outside of the unit interval (Papke and Wooldridge, 1996). One way to deal with a non-linear dependent variable is to perform a logarithmic (log) transformation of the dependent variable (Veiga, 2013; Martins and Veiga, 2013; Katsimi and Sarantides, 2015). The log transformation helps to prevent producing predicted values outside the 0 and 1 interval, so that the following equation is estimated:

$$log\left(\frac{VS_{it}^{C}}{1-VS_{it}^{C}}\right) = \alpha\left(PATR_{i,t} \times Ideology\ of\ Government\right) + \beta X_{i,t} + \gamma Previous\ vote_i + \delta Z_{i,t} + \mu_i + u_{i,t}, \quad (4.3)$$

Equation (4.2) is transformed into a linear form, and so Equation (4.3) can be estimated using the OLS estimator. There has been a transformation from the interval $[0, 1]$ to the interval $[-\infty, +\infty]$ so that it avoids the possibility of producing predicted values outside of the unit interval. It is therefore possible to model the mean of the transformed response in Equation (4.3) as a linear model, although there are some drawbacks attached to this (Ferrari and Cribari-Nieto, 2004). On transforming the dependent variable, it is not possible to easily interpret the model parameters in terms of the original response since the response variable has changed. Further, given that the dependent variable is in the form of a proportion, the assumption of

normality does not now hold. Further, if the log transformation is used, then it is difficult to estimate the marginal effects of the explanatory variables on the vote share of the incumbent government since the coefficient estimates are not on the original dependent variable.

To overcome these difficulties, the Generalized Linear Model (GLM) that allows a linear model to be related to a dependent variable that follows a non-normal distribution can be used. The main feature of the GLM is that it consists of a linearizing link function, which transforms the mean of the response variable to the linear function of regressors (Fox, 2016). The linearizing link function is given by:

$$g(\theta) = \eta = XB, \qquad (4.4)$$

where η is the linear predictor and B is the explanatory variables on the right hand-side of Equation (4.2). As such, the expected value of the response variable, θ, is linked to the linear predictor by the link function. The main feature of the GLM is the invertible linearizing link function (inverse-logit function) given in Equation (4.5),

$$\theta = g^{-1}(\eta). \qquad (4.5)$$

Consequently, in the GLM framework, the conditional mean function of the non-normally distributed random variables can be written in terms of a linear predictor and inverted link function, which for the vote share equation is as follows:

$$E\left(VS_{it}^{C} \middle| X_i\right) = \theta = g^{-1}(\eta) = g^{-1}(X_i B). \qquad (4.6)$$

As such, Equation (4.6) is a linear model for a transformation of the expected response, where the dependent variable, VS_{it}^{C}, and $g^{-1}(\eta)$ lie between 0 and 1 for all $\eta \in \mathbb{R}$, where $\mathbb{R}$ is a set of real numbers. According to Papke and Wooldridge (1996), Equation (4.6) therefore ensures that the predicted values of the dependent variable lie in the 0 and 1 interval. Papke and Wooldridge develop a GLM for handling proportions data and propose a Fractional Response Model (FRM), by choosing an inverse-logit function such that

$$g^{-1}(\eta) = \frac{\exp(\eta)}{1+\exp(\eta)}, \qquad (4.7)$$

and the link function in Equation (4.4) is the logit link function given by

$$logit(VS_{it}^{C}) = log\left(\frac{VS_{it}^{C}}{1-VS_{it}^{C}}\right). \qquad (4.8)$$

In the Papke and Wooldridge model, the non-linear estimation of the model is carried out by maximising the Bernoulli log-likelihood function, given by:

$$\ln L = VS_i^C \ln[g^{-1}(X_i B)] + \left(1 - VS_i^C\right) \ln[1 - g^{-1}(X_i B)], \qquad (4.9)$$

which is defined for $0< g^{-1}(.) < 1$. The choice of the Bernoulli log-likelihood is because it is easy to maximise the log-likelihood function of an exponential family. As proposed by Papke and Wooldridge, by maximising Equation (4.9), it is possible to estimate B using the Quasi-Maximum Likelihood Estimation (QMLE) method, irrespective of the distribution of the dependent variable.

Although Papke and Wooldridge (1996) use a Fractional Logit model, where the dependent variable is the pension plans participation rates, Papke and Wooldridge (2008) argue that the Fractional Probit is preferred in the case of a panel data to allow for unobserved time-constant district effects. Consequently, in estimating Equation (4.2) for a panel data, the Fractional Probit is obtained using the QMLE as it takes into account the non-linearity of the dependent variable and there is no need to transform the bounded values. In this case, the Fractional Probit is used to control for unobserved exogeneity and to account for country fixed effects. In estimating the effect of a change in the PATRs on the vote share of the incumbent government in Chapter 6, the baseline findings are those of Equation (4.3) using the FE estimator, and these results are compared with the estimates of Equation (4.2) using the QMLE method. Marginal effects are also provided to compare the magnitude of the coefficients from the different estimation techniques. Likewise, in Chapter 7, the basic findings are examined using the FE estimator following a log transformation of the dependent variable and the main findings are carried out using the QMLE method.

4.4 The Household Types and net Personal Average Tax Rates

As discussed in Section 4.2, the tax structure used in this thesis is the net Personal Average Tax Rates (PATRs) and these are available for thirteen different household groups. In this section, the features of the different household types are described, followed by an explanation of the

PATRs. Finally, the section provides an analysis of the variation of the PATRs across the EU26 member countries over the 1996-2016 period.

4.4.1 *The Household Types*

An important contribution of this thesis is the use of the PATRs, which are available for different household groups. The choice of household types is necessarily based on the data for which the PATRs are available. There are thirteen household types and these are distinguished according to the number of individuals in the household, the marital status of the earner, the income level of the principal (and if relevant secondary) earner and the number of dependents (children aged between six and eleven) in the household. The household types (HT) are shown in Table 4.1.

Table 4.1: The Characteristics of the Household Types

Household Type (HT)	Marital Status	Number of Children	Earnings (% of Average Earnings)	
			Principal Earner	Secondary Earner
1	Single Individual	0	50%	-
2	Single Individual	0	67%	-
3	Single Individual	0	80%	-
4	Single Individual	0	100%	-
5	Single Individual	0	125%	-
6	Single Individual	0	167%	-
7	Single Individual	2	67%	-
8	Married Couple	2	100%	-
9	Married Couple	2	100%	33%
10	Married Couple	2	100%	67%
11	Married Couple	2	100%	100%
12	Married Couple	0	100%	33%
13	Married Couple	0	100%	100%

Source: Author's own construction.

Household Types HT1 to HT7 are single individual households, with and without children, where in the former case the principal earner has 50%, 67%, 80%, 100%, 125%, 167% of

average earnings, and in the latter case 67% of average earnings. Household Types HT8 to HT13 are married couples with one- or two-earners, but again with and without children, where the principal earner has 100% of average earnings, as shown in Table 4.1. Overall, these household types are likely to give a good spread of the possible circumstances faced by the individuals within the different households, so they not only capture differences in the marital status and in the number of dependent children (possibly zero), but also their earning status in relation to average earnings in the economy. There is likely to be good variation in these household types and in the taxes they pay across the countries in the EU26.

The thirteen household groups, however, are a hypothetical sample, and not a true representation of the population in any country. The groups may not all be equally likely (e.g., there may be more married couples with two children than there are single individuals with two children). Furthermore, the different household groups may differ in number across the EU26, that is, they may be more prevalent in some countries, but relatively less so in others. For this reason, as part of the robustness of the analysis of Equations (4.1) and (4.2) in Chapters 5 and 6, the PATRs are weighted according to marital status and number of children in each country, that is, by the number of single individuals with no children (and two children), and married couples with no children (and two children). This gives four different household categories to which to weight the data, as shown in Table 4.2. Given the small number of observations in Chapter 7, it is not possible to weight the PATRs.

The number of single individuals and married couples with no children (and two children) for each of the EU26 member countries are taken from *Eurostat* (2016). However, in using this data it should be noted that although the children in the thirteen household groups are assumed to be aged between 6 and 11 years inclusive, the data available from *Eurostat* for the number of single individuals (or married couples) with two children has no information on the age of the children and instead give the number for the households with a total of two children only. Also, the data available for the number of single individuals and married couples is for adults that are aged between 20 and 49. Finally, although the data is available for the period between 2006 and 2016, in the case of Denmark and Sweden these numbers are only available from 2010. As such, upon weighting the PATRs, the sample size decreases as the regression equation is estimated for the period 2010 to 2016 instead of 1996 to 2016. Tables 4.2(a) and 4.2(b) show the mean of the four different household categories over the 2006 to 2016 period (and for the period 2010-2016 for Denmark and Sweden).

Tables 4.2(a) and 4.2(b) show that across the EU26 member countries, out of the four groups of households, the mean number of married couples with two children (HT8 to HT11) is the highest, followed by the number of married couples with no children (HT12 and HT13),

number of single individuals with no children (HT1 to HT6), and the household groups consisting of single individuals with two children (HT7) has the lowest number. The weighting of the thirteen household groups are done relative to the EU average with respect to the four household categories as described above. For instance, the PATRs for household group HT1 in Austria in 2010 is carried out as follows. First, the EU average in 2010 is calculated by taking the average of the number of single individuals with no children for all the EU26 member countries over the 2010-16 period. Second, a weighted ratio, measured by the number of single individuals with no children in Austria in 2010 divided the EU average is calculated. Finally, the PATRs is weighted by the ratio. Given the distribution of the number of individuals across the EU26 member countries, it is expected that, on weighting the PATRs, the findings more accurately indicate the groups that are more likely to be targeted by the incumbents.

Table 4.2(a): Mean of the Number of Single Individuals and Married Couples with No (or Two) Children for EU26: West EU

	Number of Single Individuals with No Children (thousands); (HT1 to HT6)	Number of Single Individuals with Two Children (thousands); (HT7)	Number of Married Couples with Two Children (thousands); (HT8 to HT11)	Number of Married Couples with No Children (thousands); (HT12 to HT13)
Austria	560.6	30.314	501.043	484.843
Belgium	531.3	74.8	789.2	494.057
Denmark	524.6	66.729	435.243	271.557
Finland	421.525	10.267	363.858	475.817
France	3345.808	444.467	4953.667	3697.067
Germany	6794.625	380.483	4856.375	5481.125
Greece	447.092	22.025	835.942	446.4
Ireland	111.936	30.327	328.8	228.773
Italy	2273.908	157.742	4534.792	2344.367
Luxembourg	33.542	2.25	43.15	32.242
Malta	6.233	1.208	31.967	11.017
Netherlands	1134.4	93.658	1403.433	1289.808
Portugal	650.142	39.958	732.1	349.617
Spain	193.083	103.183	3375.233	2515.042
Sweden	1298.862	86	746.512	472.038
UK	2846.167	664.642	4207.658	4098.542

Source: Author's own construction.

Table 4.2(b): Mean of the Number of Single Individuals and Married Couples with No (or Two) Children for EU26: CEECs

	Number of Single Individuals with No Children (thousands); (HT1 to HT6)	Number of Single Individuals with Two Children (thousands); (HT7)	Number of Married Couples with Two Children (thousands); (HT8 to HT11)	Number of Married Couples with No Children (thousands); (HT12 to HT13)
Bulgaria	193.686	18.386	352.986	218.086
Czech	384.457	69.429	982.529	516.543
Estonia	77.017	9.225	93.65	60.033
Hungary	301.492	43.633	633.2	439.917
Latvia	56.017	12.15	104.392	68.667
Lithuania	134.683	22.417	198.975	83.45
Poland	650.142	137.8	2513.158	1062.175
Romania	375.525	41.208	1286.275	670.25
Slovakia	73.433	17.183	379.158	110.558
Slovenia	67.667	6.858	170.708	55.008

Source: Author's own construction.

4.4.2 *The Net Personal Average Tax Rates (PATRs)*

Data on the net Personal Average Tax Rates (PATRs) faced by each of the thirteen Household Types are available at the country level from *Eurostat* (2016). The list of all of these PATRs for the different household groups are given in Appendix Table 4.1, and the descriptive statistics in Appendix Table 4.2. The PATR is the sum of actual personal income tax paid and the employee social security contributions, net of cash benefits, expressed as a percentage of the gross wage earnings over the same period, as follows:

$$net\ PATR = \frac{personal\ income\ tax + social\ security\ contributions - cash\ benefits}{gross\ wage\ earnings}. \qquad (4.10)$$

The PATR is advantageous since it captures the gross tax that individuals pay, including social security contributions, net of any cash benefits that derive from these tax payments and contributions. As defined by the OECD (2016), the PATR is expressed relative to the gross wage received. The calculation of PATR is based on several assumptions, and the methodology is set out in the document 'Taxing Wages' by the OECD (2016). In each household, there is a full-time employee, working in one of several sectors.[1] The secondary worker earns less than the principal earner and may not be a full-time employee, the children are aged between 6 and 11 years and the household receives income from employment only.

As regards the components of the PATR in Equation (4.4) these are as follows. First of all, the definition of the personal income tax is obtained by applying the relevant schedule of tax rate to net income (gross earnings minus tax reliefs). These tax reliefs can be divided into two groups, where the first group consists of the standard tax reliefs and the second group is the non-standard tax reliefs. The standard tax reliefs consist of the reliefs that are not related to the actual expenses of the taxpayer and are allowed to differ by characteristics such as marital status, number of children in household, work expenses as well as social contributions. The non-standard tax reliefs are determined by the actual expenses of the taxpayer, hence are not a fixed amount of income. Examples of non-standard tax allowances are reliefs for private insurance premiums and charitable donations.

Second, the social security contributions component, also known as the employee contribution, are the compulsory payments to the government made by employees as well as by employers. Since they are compulsory payments, the social security contributions can be

[1] These are: fishing; mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale and retail trade; hotels and restaurants; transport and logistics; financial intermediation; real estate and business activities; public administration and defence; education; and health and social work.

regarded as taxes, hence their inclusion in the calculation of the PATR. Social security contributions are paid with the objective of receiving a future social benefit, such as unemployment benefits, old-age pensions or sickness benefits. The calculation of the PATR does not include social security contributions made outside of the general government.

Third, the calculation of the PATR includes cash benefits which are cash transfers paid by the general government. The cash payments consist of family benefits only, which are tax reliefs or cash transfers to families in respect of the number of dependent children who are attending school and who are aged between 6 and 11 years inclusive. Since the cash benefits are considered as additional help to the families, they are deducted from PATR, which therefore shows the net tax burden.

Finally, the gross wage earnings refer to the monetary wage paid by the employer prior to tax deductions and social security contributions payable. These are the earnings of a full-time adult worker, which can be a manual or non-manual worker (from footnote 1). No distinction is made between male and female workers, their age or region where they work. Sickness payments, overtime hours, regular cash supplements and vacation payments made by the employer are included in the calculation of wages, but profit-sharing schemes in the form of dividends, fringe benefits and employers' contributions to private schemes are not included. It is based on the average hourly weekly, monthly or quarterly wage, which is multiplied by the average number of hours worked during the period.

Overall, the PATR represents the actual proportion of an individual's income that is paid in tax and is used to measure the direct level of taxation for the thirteen different household groups identified in Section 4.4.1. Note that in the case of estimating Equation (4.2), and following the work of Katsimi and Sarantides (2015), the variable *PATR* is measured in three different ways. The first measure is denoted by *Overall PATR*, which is measured as the average PATR from the year after the previous election up to and including the current election year. It captures the overall effect of PATR on the vote share of the incumbent government. The second measure, *PreElection PATR*, is measured as the average of PATRs for the years after the previous election and excluding the current election year, and captures the effect of PATRs before the election year. Finally, the third measure, *Election PATR*, is the change between the PATR in the election year and the average for all the years of the PATR in the previous years, that is, the average includes the previous election year but excludes the current election year, so that *Election PATR* measures the electoral-year change in the PATRs on the vote share of the incumbent government. For example, if in the UK, the previous election took place in 2005 and the current election is in 2010, then *Overall PATR* is calculated as the average of the PATR between 2006 and 2010, *PreElection PATR* is calculated as the average of the

PATR between 2006 and 2009, and *Election PATR* is calculated as the difference between the PATR in 2010 and the average PATR between 2005 and 2009.

4.4.3 *Variation in the PATRs across Countries and Time*

The analysis of electoral cycles and taxation is carried out across the EU26 countries so that this section examines the differences and the variation in the PATRs for the household groups across the EU26 countries. The mean values of the PATRs across the different household types over the period 1996-2016 are shown in Table 4.3 for each country, where this is split into three parts. Parts (a) and (b) of Table 4.2 show these for the sixteen West EU member states. These are sub-divided into the larger (part (a)) and smaller economies (part (b)), where these are defined according to their level of GDP in 2016. This classification of countries into two groups enables us to show more clearly the disaggregation of the PATRs across countries over the 1996-2016 period. Finally, part (c) of Table 4.3 shows the mean PATRs for the ten Central and Eastern European countries (CEECs) that are the more recent members of the EU.

From Table 4.3(a), it can be seen that in the high-GDP EU member countries, Belgium and Germany have the highest mean PATRs of 34.6% and 34.6% respectively. The overall mean PATRs among the group of countries is 26.2%, with Spain having the lowest mean PATRs of 17.2%. For the household types (HT), it is HT4, HT5, HT6 and HT10 with the highest mean PATRs of 31.2%, 33.7%, 37% and 31.2% respectively. These four household types are considered to be amongst the high-income earners given that they earn 100% or above of average wage. On the contrary, HT7 pays the lowest mean PATRs of 10.5%, where HT7 is considered to be a middle-income earner since an individual earns 67% of average wages in the group. The remaining household groups pay a mean PATRs of around 21% to 29%. In Table 4.3(b), overall the mean PATRs for the low-GDP EU member countries is around 21.4%, with Denmark having the highest mean average tax rate of 36.3%, followed by Finland and Austria at 26.8% and 25.1% respectively. At the other end of the spectrum, Malta has the lowest mean PATRs at 12.4%. In regard to the household groups, HT5 and HT6 are again found to have the highest mean PATRs, compared with HT7 having the lowest mean PATRs. It should be noted that the mean PATRs for HT7 in countries such as Ireland, Luxembourg and Malta is negative. This can be explained by the fact this household group receives more cash benefits compared to the personal income tax and social security contributions payable. Overall, the mean PATRs for the household groups have a similar pattern in both the high- and low-GDP countries.

Table 4.3(a): Mean PATRs for EU26: High-GDP Countries in the West EU

Country	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13	Mean
Belgium	26.7	35.1	38.6	42.1	45.4	49.0	16.0	22.2	35.6	42.5	27.0	33.2	36.8	*34.6*
France	19.6	25.4	26.9	28.4	30.4	32.9	13.4	16.8	25.1	28.4	18.2	21.7	23.4	*23.9*
Germany	31.4	35.7	38.4	41.4	43.9	46.2	18.1	21.5	35.7	41.1	28.0	32.7	35.6	*34.6*
Italy	20.2	24.4	26.5	29.4	32.2	35.8	3.6	16.9	24.9	29.4	19.7	23.8	26.7	*24.1*
Netherlands	23.4	28.7	31.4	32.8	35.0	39.0	7.1	23.5	29.0	32.8	24.0	27.0	29.3	*27.9*
Spain	10.2	15.9	18.2	20.7	22.9	25.6	7.2	13.0	17.2	20.7	15.8	16.7	18.9	*17.2*
Sweden	24.7	26.8	27.9	29.1	33.1	38.3	15.7	21.7	27.3	29.1	21.7	23.7	25.4	*26.5*
UK	18.4	21.9	23.6	25.4	26.5	29.5	2.8	18.8	21.7	25.2	17.1	20.3	22.5	*21.0*
Mean	21.8	26.7	28.9	31.2	33.7	37.0	10.5	19.3	27.1	31.2	21.4	24.9	27.3	26.2

Note: HT1 to HT13 refer to the thirteen Household Types shown in Table 4.1. PATRs calculated for each country as the mean across the years 1996-2016.

Table 4.3(b): Mean PATRs for EU26: Low-GDP Countries in the West EU

Country	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13	Mean
Austria	21.1	26.4	29.1	32.1	35.1	37.2	3.6	17.1	28.0	32.1	17.9	21.8	25.4	*25.1*
Denmark	36.3	38.1	39.2	40.6	43.8	48.0	11.9	28.6	38.2	40.6	33.3	35.6	37.3	*36.3*
Finland	20.9	25.3	28.3	31.8	35.2	39.0	9.5	24.2	27.8	31.8	22.0	24.6	28.0	*26.8*
Greece	16.2	17.1	18.0	19.9	22.9	26.8	15.9	19.9	19.8	21.0	19.2	19.2	21.1	*19.8*
Ireland	7.5	14.5	17.5	22.1	27.7	32.9	-17.3	4.3	14.1	22.0	8.2	13.3	18.1	*14.2*
Luxembourg	16.2	20.1	23.0	27.1	31.2	35.7	-7.4	1.3	18.1	25.1	5.8	11.4	16.5	*17.2*
Malta	8.4	10.5	13.0	16.5	19.9	23.6	-6.7	4.3	14.8	17.7	10.7	12.8	16.2	*12.4*
Portugal	12.7	16.9	19.7	22.7	25.3	29.7	5.2	10.9	17.5	22.9	12.4	17.0	20.1	*17.9*
Mean	17.4	21.1	23.5	27.6	30.1	34.1	1.8	13.8	22.3	26.7	16.2	19.4	22.8	21.2

Note: HT1 to HT13 refer to the thirteen Household Types shown in Table 4.1. PATRs calculated for each country as the mean across the years 1996-2016.

Table 4.3(c): Mean PATRs for EU26: CEECs

Country	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13	Mean
Bulgaria	14.7	17.0	18.5	20.0	21.3	22.7	-5.1	11.3	17.7	19.7	12.3	13.2	16.1	*15.3*
Czech	17.3	20.0	21.4	23.0	24.6	26.3	-9.8	-1.0	20.7	23.0	9.1	14.0	17.5	*15.8*
Estonia	16.1	18.3	19.3	20.3	21.1	21.9	-5.2	10.5	18.4	20.3	11.6	14.0	15.6	*15.5*
Hungary	24.4	27.9	30.0	34.2	37.2	39.7	0.9	17.7	30.8	34.2	18.4	21.8	25.9	*26.4*
Latvia	25.6	27.1	27.8	28.6	29.2	29.8	7.7	15.9	27.0	28.6	19.0	21.6	23.2	*23.9*
Lithuania	19.3	22.4	23.9	25.4	26.6	27.7	3.7	21.2	22.4	25.4	20.3	22.6	24.0	*21.9*
Poland	22.6	23.9	24.5	25.1	25.6	26.2	17.2	19.4	23.9	25.1	20.8	22.4	23.8	*23.1*
Romania	22.9	24.9	25.9	27.2	28.3	29.9	8.4	15.6	25.5	27.2	17.9	20.3	22.3	*22.8*
Slovakia	15.4	18.6	20.1	21.7	23.3	25.0	-1.0	3.4	18.7	21.7	9.4	13.1	16.1	*15.8*
Slovenia	27.3	30.4	31.6	33.8	36.3	39.3	3.1	13.8	31.8	33.8	21.5	25.1	28.4	*27.4*
Mean	20.5	23.0	24.3	25.9	27.4	28.9	2.0	12.8	23.7	25.9	16.0	18.8	21.3	20.8

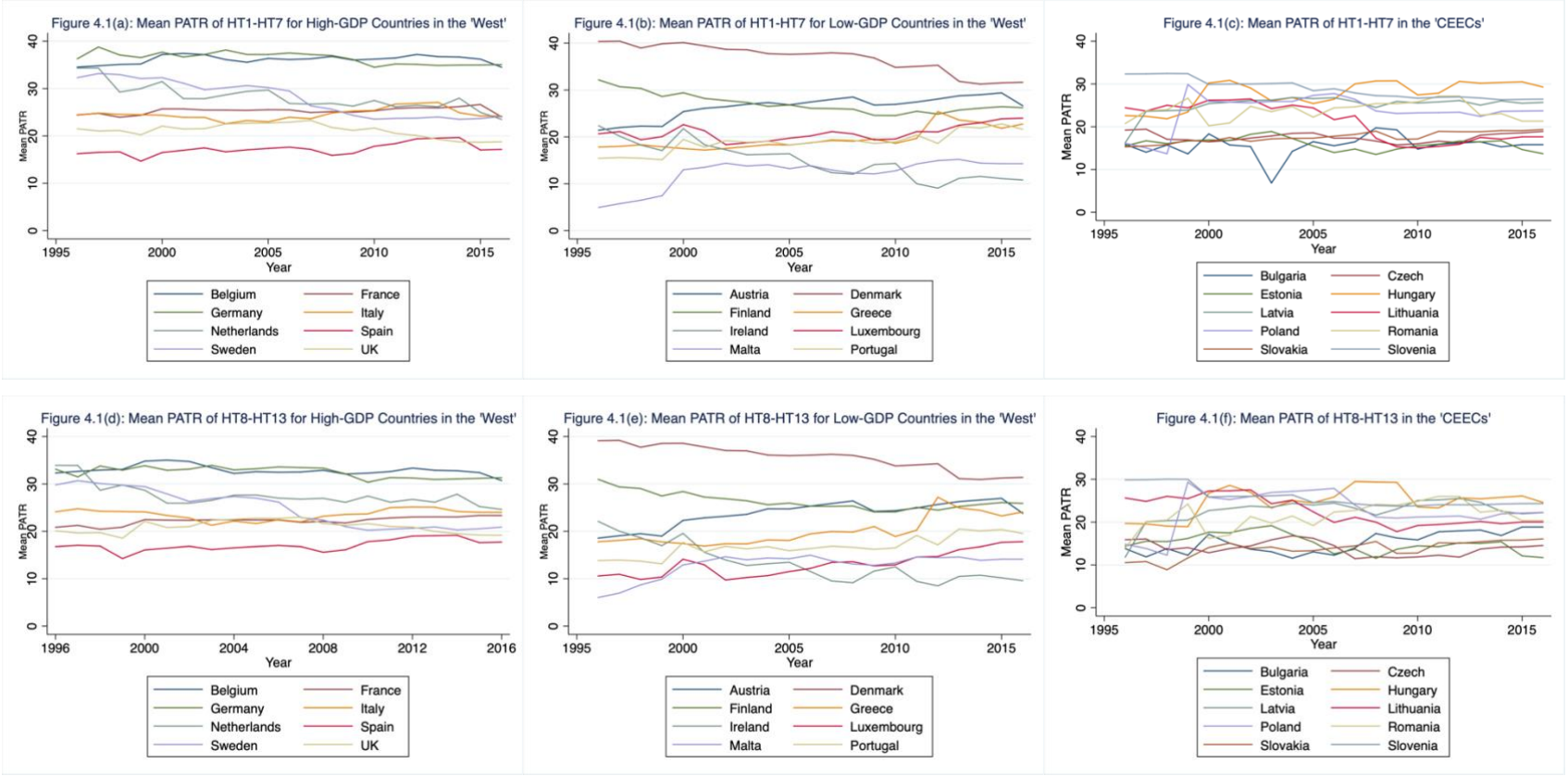
Note: HT1 to HT13 refer to the thirteen Household Types shown in Table 4.1. PATRs calculated for each country as the mean across the years 1996-2016.

For the CEECs, Table 4.3(c) shows the mean PATRs is 20.7% so that average tax rates are similar to the low GDP countries in the West EU. Within the CEECs, Slovenia has the highest mean of 27.4% compared to Bulgaria with the lowest mean of 15.3%. Similar to the high- and low-GDP West EU countries, HT6 bears the highest mean PATRs at 28.7%, while HT8 and HT7 have the lowest mean PATRs at 13.4% and 3.3% respectively. Overall, the high-GDP EU member countries have a higher mean PATRs compared to that of the low-GDP EU member countries and the CEECs, while the pattern amongst the household groups are similar across all groups of countries.

The thirteen household groups are aggregated to the level of the single households (HT1 to HT7) and married households (HT8 to HT13), and these mean PATRs for the three groups of countries over time are shown in Figures 4.1(a) to 4.1(f), where Figures 4.1(a) to 4.1(c) are for the single households and Figures 4.1(d) to 4.1(f) are for the married households. The difference between Table 4.3 and Figure 4.1 is that the former uses the mean for each household groups separately, but the latter uses the mean of the single households and married households as two separate groups. The trends in Figure 4.1 are now explored.

Compared to the West EU, there is much greater fluctuation occurring in the average PATRs for the CEECs for both the single and married households. For example, there is a change in the mean PATRs almost every year in Bulgaria, where it is at its peak at 19.7% in 2008 or lowest at 6.8% in 2003. The tax rate in Lithuania stands at 24.4% in 1996 but gradually falls to 17.6% in 2015. In Poland the mean PATRs for the household groups consisting of single individuals is at 16.2% during 1996, which later jumps to 29.9% in 1999 and slightly decreases to reach 23.7% in 2008. The only country, which has a relatively stable tax rate among the CEECs is Latvia, where the mean PATRs is around 16.3% in 1996 and decreases to 23.6% in 1997, but over 1997 to 2016, the mean PATRs stayed at an average of 25.6%. There is a similar pattern to the married households (HT8 to HT13) in the CEECs, but with the exception of Bulgaria. In Bulgaria, while for the single household groups there is a drastic fall in the mean PATRs in 2003 this is not the case for the married household groups, where the mean PATRs stayed at an average of 15.2% over 1996 to 2016.

Figure 4.1: Mean PATRs for Single and Married Households for EU26 Countries 1996-2016



A further more detailed breakdown of the PATRs, but this time for each household group by country over the 1996-2016 period is shown in Appendix Figures 4.1 to 4.13. These Appendix Figures show that broadly the same pattern applies to each of the separate household groupings so that the ranking by country in Figure 4.1 also applies to each of the household groups. Also, across the EU26 member countries, the mean PATRs for the household group HT7, which consists of single individuals with two children, is the lowest among the household groups, but the household groups consisting of single individuals with no children (HT5 and HT6), and married couples with no children (HT13) have the highest mean PATRs. Similar to Table 4.3, it can also be seen that there are more fluctuations in the mean PATRs in the CEECs compared to the West EU member countries.

4.5 Vote Share

Chapter 6 investigates if changes in tax rates affect the vote share of the incumbent government and this is analysed using both Equation (4.2) and Equation (4.3). The data on the dependent variable, VS^C, is taken from the *Inter-Parliamentary Union* (*IPU*) and the *Election Guide of the International Foundation for Electoral Systems* (*IFES*). These sources provide comprehensive information on the percentage of vote received by the incumbent government.

Tables 4.4(a) and 4.4(b), for the West EU and CEECs respectively, show that across the EU26 countries there are 143 elections between 1996 and 2016, and 64 occasions where the incumbent government was re-elected. Indeed, in many countries the same government has been in power for many years over the period. For example, Luxembourg and Sweden have had the same government over 1996 to 2016, whilst other parties have lost elections on a few occasions only, including Denmark (except for 2001 and 2005), Germany (except for 2009), Hungary (except 2010) and Ireland (except 2011). Of the 64 elections where the incumbent is re-elected, there are 35 cases (around 55%), where the incumbent has experienced a fall in its vote share. Tables 4.4(a) and 4.4(b) also show that there are less re-elected incumbents in the CEECs compared to the West EU. According to Jung (2018), the CEECs are relatively young and unstable democracies, which differs from the more-established ones in the West EU. As such, the voting behaviour in the West EU and CEECs may be different, so that is necessary to compare the voting behaviour between these to allow for any volatility in voting behaviour.

Table 4.4(a): General Elections in the West EU Countries

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Malta	Netherlands	Portugal	Spain	Sweden	UK
1996							NR		NR		NR			NR		
1997					NR			R								NR
1998			R			R					NR	R			R*	
1999	R*	NR		R*						R*			R			
2000							R							R		
2001			NR						NR							R*
2002	NR				NR	R*		R				NR	NR		R	
2003		R		NR							NR	R				
2004							NR			NR				NR		
2005			R*			R*							NR			R*
2006	NR								NR			R*			R*	
2007		NR	R*	R*	R		R*	R								
2008	R*								NR		R*			R		
2009						NR	NR			NR			R*			
2010		R*										NR			R*	NR
2011			R	R				NR					NR	NR		
2012					NR		NR					R				
2013	R*					R			NR	R*	NR					
2014		R													R	
2015			NR	R			NR						NR	R*		R
2016								R*						R		

Key: R = Re-elected
NR = Not re-elected
R* = Re-elected but vote share decreased since previous election

Source: Information regarding the election timing for the EU26 is taken from the website *Inter-Parliamentary Union* (IPU, https://data.ipu.org/) and the *Supplement to the Comparative Political Data Set* (Armingeon *et al.*, 2016).

Table 4.4(b): General Elections in the CEECs

	Bulgaria	Czech	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia
1996		NR				NR		NR		NR
1997	NR						NR			
1998		NR		R*	NR				R*	
1999			NR							
2000						NR		NR		R
2001	NR						NR			
2002		R*		R*	NR				R*	
2003			R							
2004						NR		NR		R*
2005	NR						NR			
2006		NR		R	NR				NR	
2007			NR				NR			
2008						NR		NR		NR
2009	NR									
2010		NR		NR	NR				NR	
2011			R		NR		R*			NR
2012						NR		NR	R	
2013	R*	R*								
2014	R			R*	NR					NR
2015			R*				NR			
2016						NR		NR	R*	

Key: R = Re-elected
NR = Not re-elected
R* = Re-elected but vote share decreased since previous election

Source: Information regarding the election timing for the EU26 is taken from the website *Inter-Parliamentary Union* (PARLINE, https://data.ipu.org/) and the *Supplement to the Comparative Political Data Set* (Armingeon *et al.*, 2016).

The use of vote share has been used in a number of studies, as seen in Chapter 2, such as Revelli (2002), Johnson *et al*. (2005), Bosch and Solé-Ollé (2007), Drazen and Eslava (2010) and Katsimi and Sarantides (2015), although some studies have used a binary term to capture re-election. The advantage of the vote share is that it captures whether the incumbent government wins or loses votes, compared to the re-election binary variable which cannot capture the votes gained or lost from one election to another and hence cannot capture voting behaviour. Indeed, Tables 4.4(a) and 4.4(b) show governments are re-elected in periods where it is losing votes. The vote share is therefore more sensitive with regards to the change in popular support for the incumbent government (Veiga, 2013). As part of the robustness tests in Chapter 6, the effect of an electoral change in the PATRs on the incumbent's re-election probability will also be regressed using the logit estimator. The logit estimator uses binomial probability theory, whereby there are only two values to predict. In this case, the two values are if the incumbent government is re-elected and if it is not re-elected. Since the dependent variable is in a binary form, it satisfies the assumption of the logit estimator. The logit model is widely used to study binary dependent variables, and it is used to model the probability that a certain event is observed (Press and Wilson, 1978; Powers *et al.*, 1978). Since the net PATR may differ across countries, country fixed effects are taken into account (Chamberlain, 1980). Indeed, studies on electoral accountability have employed the logit estimator when the dependent variable is captures the re-election chances (Brender and Drazen, 2008; Alesina *et al*., 2013).

Finally, the effect of a change in the PATRs is conditional upon the ideology of the government, and this is discussed in Section 4.7. As mentioned in Chapter 2, it is expected that the right-wing party experiences an increase in its vote share following a decrease in the PATRs compared to the left-wing party. This is because the voters are aware that the right-wing party focuses on reducing taxes compared to the left-wing party that instead tend to focus on public expenditure. Therefore, the vote share the incumbent government received in the previous election, denoted by Previous vote, is included as a control variable in Equation (4.2). The Previous vote variable captures the incumbency advantage, that is, the past support of the incumbent government impacts on the current vote share VS^{C}.

4.6 Elections

In the following sections, the main independent variables used in the analysis are described. A list of these variables and descriptive statistics are provided in Appendix Tables 4.1 and 4.2. This section explains the important election variables that are used in Equation (4.1). The election dates are taken from the *Database of Political Institutions of the World Bank* (Beck *et al.*, 2001). In the rare cases when there is missing information from the *Database of Political Institutions of the World Bank*, the election dates are complemented by the *International Foundation for electoral Systems (IFES) Election Guide* (1996-2016).

Following much of the literature, there are two ways of measuring an election year in order to capture electoral effects. Firstly, the election dummy variable, *Election*, is created that is equal to 1 in the election year and 0 otherwise. This measure is used so that the results can be easily compared with the existing literature on political budget cycles that predominately use this way of measuring an election year. The variable *Election*, however, will mostly capture the pre-election effects if the election occurs towards the end of the year, and will mostly capture the post-electoral effects for elections taking place early in the year (Angelopoulos and Economides, 2008; Katsimi and Sarantides, 2012). To tackle this issue in the first research question (Equation (4.1)), I carry out a robustness test using a different measure for the election term. Following the study of Angelopoulos and Economides (2008), Katsimi and Sarantides (2012) and Klomp and de Haan (2013a), two alternative measures are introduced that are $Election_t$, which is equal to $x/12$ in the year of the election, and $Election_{t-1}$, which is equal to $(12-x)/12$ in the previous year of the election (and zero otherwise), where x is the month the election is held in the election year. The variable $Election_t$ therefore captures the share of the months in the year leading up to the election in the election year and $Election_{t-1}$ captures the share of the twelve months in the pre-election year. In Chapter 6, the variable *Election PATR* is altered so that a new variable, *Election monthly*, is used. *Election monthly* takes into account whether an election takes place in the first or second half of the year. As such, if an election takes place in the first six months of the year, then the election year is defined as the year before the election, and if an election takes place in the second half of the year, then the election year is defined as the election year itself.

It is expected that the variable *Election* has a negative effect on the PATRs in Equation (4.1), which captures the electoral effect and indicates the opportunistic behaviour of the incumbent government. This means that all governments behave opportunistically in order to increase their chances of being re-elected. However, governments have different ideologies

and there may also be partisan motives (see Chapter 2 for a discussion of these models that capture the differences in implementing fiscal policy by governments of different ideology). In this thesis, the opportunistic and partisan influences are captured separately, but by interacting these terms then the interactions between these can also be captured, i.e., the interaction term tests partisan motives in an opportunistic government. The government ideologies used to test the partisan motives are discussed in the next section.

Finally, it should also be noted from Chapter 3 that the election dates are not always pre-determined. Economic conditions, coalition collapse or stochastic events may lead to an election to take place outside of the constitutionally fixed term. The relationship between the elections and the PATR may therefore be biased if all the elections are considered as pre-determined. For this reason, both in Chapters 5 and 6, robustness tests are carried out by differentiating between elections that are and are not pre-determined. In Chapter 5, two dummy variables are created and these are *Election: Pre-Determined*, which is equal to zero if the election date is pre-determined and zero otherwise, and *Election: Other*, which is equal to zero if the election date is not pre-determined and zero otherwise. In Chapter 6, however, only the sample of the pre-determined elections are considered because there are only 32 observations for the not pre-determined elections.

4.7 Political Variables

The characteristics of a government will affect the fiscal policy priorities of the government and therefore have an effect on the variable *PATR* in Equations (4.1) and (4.2). In this section, the focus is on the political variables that are used as control variables. I start by looking at the variables capturing the government ideologies, followed by a discussion on the relationship between the PATRs and the government ideologies.

Usually, the governments adopt different policies in order to target the welfare of their supporters, giving rise to partisan motives. In general, the right-wing parties tend to limit government spending and put more emphasis on tax cuts. This is in contrast to the left-wing and the centre-of parties that are inclined towards government spending. To capture the partisan motives, three dummy ideology variables are created as follows: a dummy variable *Left-wing* is set to 1 for the left-wing government and 0 otherwise, a dummy variable, *Right-wing* is equal to 1 for the right-government and 0 otherwise, and a dummy variable, *Centre-of*, is equal to 1 for the centrist government and 0 otherwise. Data on government ideology is taken from the *Database of Political Institutions (DPI)* in the Development Research Group of the World Bank. Table 4.5 shows the share of years, a right-wing, left-wing and centre-of governments

have been elected in each of the EU26 countries over the period 1996-2016. The table shows that the member countries in the West EU are a mix of mainly right- and left-wing governments, while in the CEECs the centre-of government is more prevalent. There are two countries within the EU26 that have not changed their government ideology over the period, these being Sweden and Luxembourg who have had a left-wing and a centre-of government respectively.

As discussed by Tillman and Park (2009), right-wing parties tend to place more emphasis on taxation compared to left-wing parties that focus mostly on government spending. Consequently, right-wing parties are likely to engage in tax cuts, while left-wing parties will focus on public expenditure. As such, the government ideologies *Right-wing* and *Left-wing* are included in Equation (4.1). To capture the opportunistic partisan motives as mentioned in Section 4.6, the interaction terms between the *Election* dummy variable and the government ideologies are included in Equation (4.1), where although it is expected that the right-wing party may engage in electoral cuts in the PATRs, the left-wing party may also have the same behaviour if the left-wing party is opportunistic in that it decreases the PATRs in the run-up to an election to possibly increase its re-election chances. The interaction terms between the government ideologies and the different measures of the variable *PATR* (as mentioned in Section 4.4.2) are included in Equation (4.2). It is expected that the right-wing party is likely to be rewarded for PATRs cuts given the importance placed on taxes by the right-wing party compared to the left-wing party.

Table 4.5: Proportion of Left/Right- and Centre Governments in EU26

Country	Left-wing Government	Right-wing Government	Centre-of Government
High-GDP EU in the West EU:			
Belgium	14%	76%	10%
France	43%	57%	0%
Germany	33%	67%	0%
Italy	14%	48%	38%
Netherlands	38%	62%	0%
Spain	38%	62%	0%
Sweden	100%	0%	0%
UK	62%	38%	0%
Low-GDP EU in the West EU:			
Austria	67%	33%	0%
Denmark	52%	48%	0%
Finland	33%	24%	43%
Greece	52%	48%	0%
Ireland	0%	33%	67%
Luxembourg	0%	0%	100%
Malta	24%	76%	0%
Portugal	67%	33%	0%
CEECs:			
Bulgaria	0%	43%	57%
Czech Republic	48%	14%	38%
Estonia	0%	29%	71%
Hungary	71%	29%	0%
Latvia	0%	48%	52%
Lithuania	0%	5%	95%
Poland	48%	24%	28%
Romania	19%	19%	62%
Slovakia	62%	0%	38%
Slovenia	62%	0%	38%

Source: Author's own construction.

The relationship between government ideology and the PATRs for the EU 26 countries is given in Table 4.6, which shows the mean of the 13 PATRs when the different ideology governments are in power in each country, for example when the left-wing government is elected in Belgium the mean PATRs is 36.0%. Overall, for the countries in the West EU, the mean PATRs is relatively lower under the right-wing government compared to the left-wing government. This is in line with the ideology of the right-wing party, which is to have low taxes. In the CEECs however, the mean PATRs is higher under the right-wing government compared to the left-wing and centre-of governments.

Table 4.6: Relationship between Government Ideology and Mean PATR

	Left-wing Government	Right-wing Government	Centre-of Government
High-GDP EU in the West EU:			
Belgium	36.0%	34.7%	33.6%
France	24.0%	23.8%	-
Germany	35.4%	34.2%	-
Italy	24.4%	23.9%	24.3%
Netherlands	29.9%	26.7%	-
Spain	17.0%	17.2%	-
Sweden	26.5%	-	-
UK	21.8%	19.9%	-
Low-GDP EU in the West EU:			
Austria	25.1%	25.3%	-
Denmark	36.0%	36.6%	-
Finland	29.1%	25.7%	25.6%
Ireland	-	13.5%	14.6%
Luxembourg	-	-	17.2%
Malta	10.6%	12.9%	-
Portugal	17.3%	19.3%	20.7%
CEECs:			
Bulgaria	-	15.6%	15.1%
Czech Republic	16.3%	17.0%	14.8%
Estonia	-	16.3%	15.3%
Greece	18.1%	21.7%	-
Hungary	25.9%	27.7%	-
Latvia	-	24.2%	23.7%
Lithuania	-	25.1%	21.8%
Poland	23.0%	24.0%	22.5%
Romania	21.8%	22.1%	23.4%
Slovakia	16.0%	-	15.5%
Slovenia	28.3%	-	26.0%

Source: Author's own construction.

Finally, coalition and single-party governments may not have the same fiscal policies, since the governments made up of many parties tend to have larger deficits (Klomp and de Haan, 2013b). Since coalition governments have different fiscal policies, a dummy variable *Coalition* is also created to capture whether a government is in coalition or not. As seen from Appendix Table 4.1, *Coalition* is set to the value of 1 if the incumbent government is a coalition party and 0 if it is a single-party. Data on the coalition dummy is taken from the *Comparative Political Data Set (CPDS, 2016)*. It is expected that a coalition will engage in electoral manipulations by decreasing the PATRs. Moreover, it is possible that the voters may reward/punish each party

of a coalition government differently. For these reasons, to capture whether the government is a coalition government is included in both Equations (4.1) and (4.2).

4.8 Socio-Economic Variables

In this section, the focus is on the socio-economic variables that are used in Equations (4.1) and (4.2). In providing information regarding the rationale for these variables, I also provide the definition of each variable and some discussion of the measurement (see also Appendix Tables 4.1 and 4.2). I start by looking at the macroeconomic variables followed by the demographic variables that are included as explanatory variables. The choice of these explanatory variables is based on the comprehensive literature review carried out in Chapter 2.

A country's macroeconomic condition is related to its fiscal policies, that is, changes in the economic stability may influence how its policies are implemented. In the vast majority of the political budget cycle literature reviewed in Chapter 2, the first set of economic factors that are found to impact these policies are *GDP*, *GDP per capita* and *GDP growth*. Data regarding these variables are obtained from the *World Development Indicators (WDI,* 2016*)*. As defined by the *WDI*, GDP is defined as the total gross value added by all resident producers in the economy. Usually a high level of GDP in a country is likely to lead to an increase in the tax rate, hence a positive effect of *GDP* is expected. In addition, *GDP per capita* is used as a proxy for the improvement in the standard of living of the population. *GDP per capita* is expected to have a positive effect on the *PATR*, since larger economies with a wealthy population is more likely to bear a high-income tax rate. As seen in Appendix Table 4.1, the variables *GDP* and *GDP per capita* are measured in US dollars.

The GDP growth rate, denoted by *GDP growth*, is an indicator for the position and development of an economy so that if an economy is prospering then it is likely that the workers may witness an increase in their income tax burden. For the effect of a change in the PATRs on the vote share of the incumbent government, it is expected that these three variables have a positive effect on the vote share since the voters are likely to reward the incumbent government if the economy is prospering (see Chapter 2). The descriptive statistics in Appendix Table 4.2 show that *GDP* and *GDP per capita* are positively skewed, and so a logarithmic transformation of these is used in Equations (4.1) and (4.2). Moreover, in Equation (4.2), the variables *GDP*, *GDP per capita* and *GDP growth* are measured as the average during the term in office.

The next economic factor is the inflation rate. According to studies, such as Immervoll (2006) and Nam and Zeiner (2015), when a country experiences inflation this leads to income moving into higher tax brackets. As a result, even if real income is not changed, the increase

in income due to inflation leads to a rise in the real tax burden for taxpayers. The inflation rate, denoted by *Inflation* and as defined in Appendix Table 4.1, is included in both Equations (4.1) and (4.2). Data on *Inflation* is taken from *WDI (2016)*. A positive impact of the inflation rate on the average tax rates is expected in Equation (4.1) as workers move up higher tax brackets as a result of inflation so that the individuals' tax burden is increased. In the case of voter share, a negative effect is expected since voters may not want to reward the incumbent government that increases the inflation rate and increases the tax burden. As seen from Appendix Table 4.2, *Inflation* has a minimum value of around -4.48% and a maximum value of around 1058.4%. A logarithmic transformation is therefore applied to the inflation rate. However, the use of the log transformation means that the negative inflation observations are dropped (42 observations in Equation (4.1) and 3 observations in Equation (4.2)). In Equation (4.2), *Inflation* is measured as the average of the inflation rate during the term in office.

An increase in public spending implies that the government needs to find ways to finance these spending. One way to do so is to increase the tax rates in an attempt to increase taxation revenue, which may possibly be used to finance public spending. For this purpose, public spending is included and data for the variable *Govt exp* is available from the *Eurostat (2016)* database. As seen in Appendix Table 4,1 *Govt exp* consists of various components and is measured as a percentage of GDP. As public expenditure increases in an economy, this may imply that the individual tax burden is also increasing as a means to finance the expenses so that it is expected to find a positive effect between government expenditure and the PATR in Equation (4.1). Further, since voters may reward the incumbent parties if any increase in taxes is accompanied by increases in government spending then government expenditure is also included in Equation (4.2), where *Govt exp* is measured as the average during the term in office. The interaction terms between *Govt exp* and the different government ideologies are included in Equation (4.2), and it is expected that the right-wing [and left-wing] party is penalised [and rewarded] for increases in government expenditure given the focus put of government spending by the government of different ideology.

Unemployment can be used to understand how well the economy is performing as it indicates the share of the workforce that is willing and able to work. Some studies reviewed in Chapter 2, such as Katsimi and Sarantides (2015), have indicated that unemployment has an effect on the vote share of the incumbent government. *WDI (2016)* is used to extract data on the unemployment rate, which is defined in Appendix Table 4.1. Usually, it is expected that the voters are likely to reward the incumbent government for a decrease in the unemployment rate hence, the variable *Unemployment* is included in Equation (4.2), where it is measured as the average unemployment rate during the term in office.

In addition to the economic variables, demographic variables may affect fiscal policies. For instance, if a country has a high proportion of the population that consists of young children and elderly, where these groups are considered as being out of the market, this is associated with a greater need for tax revenue. Two demographic variables are therefore included in Equation (4.1) and these are the share of population aged 14 or less (*Pop14*) and the share of population aged 64 or more (*Pop64*) and the data are taken from *WDI (2016)* database. The two demographic variables show the age distribution of a country and hence capture whether a young population or an aging population has an influence on the individual tax burden. This is important as the they represent the proportion of the population who are out of the job market and do not necessarily earn any income so tend to depend on the working population and hence higher tax rates (Efthyvoulou, 2012; Ehrhart, 2013). Consequently, both variables are expected to have a positive effect in Equation (4.1).

Finally, in estimating Equation (4.2), a variable capturing the educational background of voters is included to take into consideration the level of voter awareness given that the information available to voters can have an influence on electoral accountability (Pande, 2011). Voters are more likely to process the available information depending on their education level, which can influence an incumbent's chance of re-election. Empirical studies (e.g., Akhmedov and Zhuravskya (2004) and Aidt *et al.* (2011)) capture voters' awareness through the variable that measures the level of education of the sample population. The proxy for voter awareness is included to capture the voters ability to access and utilise information, and is denoted by *Illiteracy*, which is available from Barro and Lee (2010). *Illiteracy* is defined as the level of illiteracy rate among the population aged 15 years old and above, and it is measured as the average during the term in office. It is expected that the variable, *Illiteracy*, will have a positive impact on incumbents' re-election prospects, showing that voters are able to make full use of the information available to them before casting their votes.

4.9 Conclusions

This chapter outlines the main research aims and the methodology used in the subsequent analysis in Chapters 5, 6 and 7 which analyse the electoral effects on net Personal Average Tax Rates (PATRs), the effects of changes in PATRs on the vote share of incumbent governments and the credibility of fiscal manipulations, respectively. This is for EU26 countries over the 1996-2016 period. This chapter discusses the econometric models, the dependent variables as well as the explanatory variables used in the subsequent regression analysis.

The empirical approaches reviewed in this chapter that are appropriate to the analysis in the subsequent chapters are the Fixed Effects (FE), Generalised Method of Moments (GMM) and the Quasi-Maximum Likelihood Estimation (QMLE) estimators. To analyse the electoral effects on net Personal Average Tax Rates (PATRs) in Chapter 5 the FE estimator is used to handle unobserved country-specific effects, but since a lagged dependent variable is included to account for the persistence of tax rates the GMM estimator is also used. The GMM estimator is widely used in the existing literature and corrects for the potential bias occurring due to the inclusion of the lagged dependent variable. To analyse the effects of changes in PATRs on the vote share of incumbent governments in Chapter 6, the estimator must be able to account for the non-linearity of the dependent variable that is bounded between 0 and 1, so that in addition to the FE estimator the QMLE estimator is used. The QMLE estimator is used for the main results of Chapter 6 as it takes into account the bounded nature of the dependent variable.

An important variable in the subsequent chapters is the net Personal Average Tax Rate (PATR), which is available for thirteen different household groups. Data on the PATRs are taken from *Eurostat* and the description of these is given in full in this chapter. PATRs are advantageous over the measures used in previous studies as these earlier studies mainly use tax revenue as a percentage of Gross Domestic Product and so cannot capture the actual tax burden of personal income taxpayers. Since this variable is for different groups of households it is also has the advantage of being able to analyse whether incumbent governments target a particular group of voters. Consequently, the results of Chapter 5, which examines the effects of elections on the PATRs for the different household groups, may indicate which of the thirteen household groups are more likely to be targeted by the incumbent government. Likewise, in Chapter 6, which examines the effects of an election-year change in the PATRs on the vote share, it may be possible to identify the voting behaviour of these thirteen different household groups.

The explanatory variables that are used in the subsequent chapters are also discussed, where the variables are classified into two main groups: political and socio-economic variables. The political variables are taken from a combination of the *Database of Political Institutions* (*DPI*), *International Parliamentary Union* (*IPU*) and *Comparative Political Data Set* (*CPDS*). They capture the government ideology and enable partisan effects to be examined, i.e., whether governments of different ideologies take different policy choices. Socio-economic variables are collected mainly from the *World Development Indicators (WDI)* and from *Eurostat.* The inclusion of the socio-economic variables is to explore whether they influence the PATRs in Chapter 5 and the vote share of the incumbent in Chapters 6 and 7. The methodology discussed in this chapter can now be implemented for the analysis of the relationship between taxation and electoral cycles in the EU26 countries over the 1996-2016 period.

Chapter 5. The Partisan Political Budget Cycle

5.1 Introduction

The literature review in Chapter 2 suggests that incumbent governments resort to opportunistic expansionary fiscal policy prior to elections in order to increase their popularity with voters. There is also evidence of partisan effects in fiscal policy. Empirical studies such as Schuknecht (2000), Mink and de Haan (2006), Efthyvoulou (2012), Katsimi and Sarantides (2012), Ademmer and Dreher (2016) all use multi-country data and show that a political budget cycle exists, either in terms of an increase in government spending or a reduction in taxation, in the run-up to elections. However, in the context of the European Union (EU), it was also shown in Chapter 2 that there is mixed evidence about the presence of electoral cycles in fiscal policy. For example, Andrikopoulos *et al.* (2004) do not find evidence of this for 14 EU member states over 1970-98, but both Buti and Van den Noord (2003) and Mink and de Haan (2006), using data for about a dozen EU countries over the early 2000s, find that incumbent governments manipulate fiscal instruments in the run-up to elections.

Chapter 2 further shows that scholars have mainly chosen to focus on government expenditure rather than taxation to analyse the presence of electoral cycles. Unlike changes in government spending, voters are more likely to be sensitive to changes in taxation. Indeed, Haselswerdt and Bartels (2015) mention that taxpayers are directly impacted by taxes. In the studies that focus on taxation measures this is either by the indicator of a selected tax collection as a percentage of GDP or by the total tax revenue. For instance, some studies such as Khemani (2004) uses various different compositions of tax revenue as a proportion of total own tax revenue, while Andrikopoulos *et al.* (2006) and Ehrhart (2013) use direct and indirect tax revenue as a percentage of GDP, and Bojar (2015) uses general government revenue. The issue with these variables is that there are other factors that may affect tax revenue instead of the tax rate itself. Finally, the measurements used in the existing literature tend to relate to the fiscal instruments as a single term for the electorate as a whole. However, in practice, it could well be that different political parties target different groups of voters to get re-elected, which is what the partisan model of political behaviour suggests, so that the electoral manipulations may be difficult to detect using just a single term for taxations. Indeed, it could explain the mixed evidence that has been for the European electoral cycles.

In this chapter, I use a measure of the income tax burden that is available for different groups in the electorates of the EU countries to examine if there is opportunistic partisan

behaviour in the political budget cycle. The income tax burden is measured by the net personal average tax rate (PATR), which is the sum of personal income tax and employee social security contributions net of cash benefits expressed as a percentage of personal gross wage earnings. As mentioned in Chapter 4, the PATR is available for each of the 26 EU countries for the years 1996 to 2016. As is clear in Chapter 4, the PATR is measured for two household types: single individuals and married couples, where for each of these it is disaggregated into family sizes and tiers of household income (see Table 4.1). It was argued in Chapter 2 that different political parties in office may pursue different policies with regards to their ideological beliefs. For instance, the left-wing party is known to work for the middle-income groups and putting greater emphasis on lower unemployment and increasing government spending, whereas the right-wing party works for high-income groups and focuses on lower inflation and tax cuts. As such, the PATR terms could potentially capture differences in partisan behaviour.

To the best of my knowledge, there is no other similar work that uses the PATRs at the household level, and for a panel dataset of 26 European Union (EU) member countries between 1996 and 2016, to examine whether the incumbent governments manipulate the economy for political purposes. It means I have available data for the thirteen different household groups. The results of this chapter show that there is evidence of opportunistic partisan behaviour, with governments of different ideologies manipulating the PATR to target different household groups in the run-up to elections. However, reflecting this, there is no opportunistic electoral cycle in the PATR, so that the incumbent governments (irrespective of their ideologies) do not decrease the PATR of the different household groups in the run-up to elections. Taken as a whole, the results show that the partisan opportunistic behaviour might explain the mixed evidence found for the EU26 as a whole.

The chapter is organized as follows. The next section undertakes a preliminary analysis of the effects of electoral cycles and the partisan effects on the PATR for the different household groups separately. The preliminary analysis also includes the main analysis, that is, whether the incumbent government targets a particular group of voters in the run-up to an election. This is observed by the interaction term, capturing the opportunistic partisan behaviour in the PATRs. As mentioned in Chapter 4, the difference-GMM estimator is used. In Section 5.3, the robustness checks are carried out. First, an alternative electoral measure is used that takes into account the exact timing of the elections. Second, I distinguish between pre-determined and other elections. Finally, the PATR is weighted by the number of individuals in each of the thirteen household groups for each country to allow for differences in the number of voters in each group across the EU26 countries. Finally, the conclusions are drawn in Section 5.4.

5.2 Preliminary Analysis

In this section, I undertake a preliminary analysis of the model specified in Equation (4.1) of Chapter 4. As mentioned in Chapter 4, since the inclusion of a lagged dependent term may induce bias in the OLS and FE estimates, the difference-GMM estimator is used to estimate whether the incumbent government targets a particular group of voters and the findings using the system-GMM are shown in the appendix. In this section, I look at three different specifications. The first specification consists of a model including only the *Election* variable and captures the electoral effect. The second specification adds on to the first model by including government ideologies, that is, the variables capturing whether the incumbent government is a right- or left-wing party. Finally, the third specification includes all of the control variables, that is, Equation (4.1) as stated in Chapter 4 is estimated. In each of the different specifications, the control variables are lagged by one period.

5.2.1 *Electoral and Partisan Effects on the net PATRs*

In this section, the electoral and partisan effects on the net PATRs are examined separately. Firstly, to capture the electoral effect, Equation (4.1) is amended such that the government ideologies and their interactions with the *Election* variable are not included. The empirical results for the model including only the *Election* variable and the control variables are presented in Table 5.1. On estimating the difference-GMM, it can be seen that there is a negative and significant electoral effect on the PATR for the household group HT1, which consists of single individuals with no children at 50% of average earnings. The coalition party has no significant effect on the tax variable. As regards the control variables, the economy variables, *GDP, GDP per capita* and *GDP growth* do not influence the PATR for most of the household groups. It can be noted that in most of the cases, the coefficients of *GDP* and *GDP per capita* are counter-intuitive, but a possible explanation for this relationship is given in Appendix 5.1, which shows the relationship between these variables. Unlike the expected positive effect of GDP growth on the tax variable, Table 5.1 shows that there is a negative effect of *GDP growth* on the PATR for the household group HT 9, which consists of married couples with two children. The variables *Inflation, Govt exp* and *Pop64* have no significant effect on the PATRs. Although it is expected that *Pop14* has a positive effect on the tax variable, Table 5.1 indicates that the PATR for the household groups HT4 and HT11 decrease as the dependent population increases.

Table 5.1: Electoral Effect on the net PATRs for all Household Groups

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.316*	-0.156	-0.144	-0.090	-0.071	-0.036	-0.076	-0.206	-0.134	-0.038	-0.054	-0.030	0.022
	(0.178)	(0.137)	(0.130)	(0.129)	(0.125)	(0.0975)	(0.473)	(0.196)	(0.145)	(0.130)	(0.156)	(0.123)	(0.111)
Coalition	0.375	0.578	0.530	0.859	0.898	0.860	0.586	0.618	0.741	0.426	0.646	0.828	0.879
	(0.395)	(0.457)	(0.419)	(0.558)	(0.599)	(0.558)	(0.440)	(0.706)	(0.617)	(0.554)	(0.644)	(0.509)	(0.584)
Lagged PATR	0.763***	0.744***	0.690***	0.670***	0.728***	0.774***	0.861***	0.659***	0.681***	0.550***	0.263	0.609**	0.375
	(0.164)	(0.177)	(0.210)	(0.183)	(0.257)	(0.226)	(0.181)	(0.129)	(0.148)	(0.211)	(0.227)	(0.238)	(0.244)
Control Variables:													
ln *GDP*	-11.21*	-1.958	0.792	6.590	9.557	12.84**	-9.858	0.0308	1.522	-13.17	-8.047	-3.391	-2.939
	(6.006)	(3.499)	(3.401)	(4.551)	(6.011)	(5.776)	(22.98)	(6.504)	(6.187)	(10.14)	(10.01)	(5.530)	(5.476)
ln *GDP per capita*	9.319	-0.287	-4.279	-10.92**	-13.70**	-16.18**	5.632	-5.239	-5.629	9.219	2.670	0.533	-1.678
	(5.792)	(3.361)	(3.723)	(5.015)	(6.266)	(6.295)	(18.80)	(6.377)	(5.214)	(9.858)	(9.826)	(5.555)	(5.754)
GDP growth	-3.395	-4.548	-5.122	-3.111	-4.316	-4.691	-7.193	-5.831	-7.569*	-5.963	-1.090	0.924	0.683
	(4.409)	(4.135)	(4.050)	(4.032)	(4.201)	(3.304)	(8.368)	(4.689)	(4.358)	(3.843)	(3.010)	(4.195)	(3.673)
ln *Inflation*	-0.082	-0.069	-0.077	-0.076	-0.089	-0.070	0.322	0.041	0.037	0.072	0.031	-0.057	-0.005
	(0.085)	(0.065)	(0.064)	(0.056)	(0.065)	(0.067)	(0.223)	(0.086)	(0.092)	(0.078)	(0.056)	(0.053)	(0.045)
Govt exp	3.858	0.836	-1.120	-2.962	-3.486	-0.864	-6.881	-2.217	2.651	1.034	-1.023	3.320	-1.271
	(4.173)	(3.626)	(3.527)	(3.575)	(3.516)	(3.611)	(11.59)	(7.016)	(6.341)	(3.623)	(3.129)	(2.986)	(2.481)
Pop14	-0.240	-0.187	-0.237	-0.341**	-0.254	-0.155	-0.522	-0.217	-0.311	-0.294	-0.457*	-0.139	-0.379*
	(0.173)	(0.162)	(0.164)	(0.168)	(0.186)	(0.195)	(0.547)	(0.330)	(0.322)	(0.235)	(0.270)	(0.210)	(0.224)
Pop64	-0.234	-0.077	0.011	-0.008	0.006	-0.004	-0.550	0.043	-0.091	0.104	0.175	-0.014	0.136
	(0.188)	(0.153)	(0.149)	(0.129)	(0.162)	(0.156)	(0.504)	(0.225)	(0.190)	(0.179)	(0.236)	(0.150)	(0.153)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	11	11	11	11	11	11	11	11	11	11	11	11	11
AR (1) p-value	0.025	0.029	0.069	0.034	0.056	0.051	0.001	0.003	0.006	0.040	0.117	0.083	0.146
AR (2) p-value	0.520	0.800	0.681	0.222	0.264	0.167	0.525	0.255	0.902	0.897	0.676	0.325	0.582
Hansen p-value	0.380	0.402	0.213	0.420	0.272	0.572	0.390	0.655	0.203	0.252	0.804	0.101	0.967

Notes: Estimation of Equation (4.1) using the difference-GMM estimator. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election and ideology dummies and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. The reference country is Luxembourg.

Prior to examining the electoral effect on the PATRs using all of the control variables, the incremental addition of the different control variables was applied, and these findings are shown in Appendix Tables 5.1 to 5.4. Initially, a specification including the *Election, Coalition* and demographic variables is used and the findings are shown in Appendix Table 5.1. Similar to Table 5.1, the findings in Appendix Table 5.1 indicate that there is a decrease in the PATR for the household group HT1 in the run-up to an election. Besides demographic variables, Equation (4.1) also consists of macroeconomic variables, and the equation is amended to take into account these variables without including the demographic variables. The findings of this specification are shown in Appendix Table 5.2, where there is a negative and significant electoral effect on the PATR for the household group HT1. Again, the coefficients of the variables *GDP* and *GDP per capita* are counter-intuitive, but for reasons discussed above and in Appendix 5.1.

The inclusion of the government expenditure variable in Appendix Table 5.2 may however suffer from potential endogeneity in that although it is likely that government expenditure has an effect on taxation a two-way relationship between taxation and government spending may also arise as increasing taxes lead to more government spending (Friedman, 1978). The findings for a specification without the control are given in Appendix Table 5.3. The findings, however, indicate that including the variable *Govt exp* does not alter the findings in Appendix Table 5.1 with the electoral effect on the PATR for the household group HT1 still negative and significant.

As discussed in Chapter 4, the majority of the studies on political budget cycle take into account time fixed effects. In order to make this study comparable to the existing studies, year fixed effects are included in the specification focused on the electoral effects of the net PATR for the different household groups. The difference-GMM findings are shown in Appendix Table 5.4, which includes the full set of control variables. On including the year fixed effects, it can be seen that the variable *Election* is no longer statistically significant, although the coefficients are negative for some of the household groups. It can also be seen that some of the macroeconomic variables such as GDP, GDP per capita, GDP growth and government expenditure are omitted from the results. An explanation for these omissions is that these variables are collinear with the year fixed effects. In addition, as discussed in Chapter 4, the Hansen test is missing since both the number of instruments and the number of coefficients is equal to 30 and there are not enough degrees of freedom left to calculate the Hansen test. The missing Hansen test implies that it is not possible to check the validity of the instruments used for the difference-GMM estimator and hence the inclusion to time fixed-effects impacts on the consistency of the results. Consequently, in the following sections, the year fixed effects are

not included in either Equation (4.1) or the specifications analysing the electoral and partisan effects separately. Overall, the findings in Appendix Tables 5.1 to 5.4 in relation to the electoral effects are similar to that of Table 5.1 and it can be said that the preliminary findings in Table 5.1 are not being driven by a specific group of controls

Furthermore, although it is discussed in Chapter 4 that the difference-GMM estimator is preferred to the system-GMM estimator, the specification analysing the electoral effects is also estimated using the system-GMM for comparison. These findings are shown in Appendix Table 5.5. Similar to the findings in Table 5.1, the net PATR for the household group HT 1 is decreased in the run-up to an election. Overall, it can be noted that the findings in Appendix Table 5.5 are relatively similar to that of Table 5.1. However, as mentioned in Chapter 4, it is imperative to check the validity of the additional instruments used for the system-GMM estimator using the difference-in-Hansen test. From Appendix Table 5.5, on calculating the difference-in-Hansen test for the additional instruments, these are missing. As explained in Chapter 4, it is not possible to calculate the difference-in-Hansen test as there are no degrees of freedom left when the number of instruments is equal to the number of observations. Given that the findings of the difference-GMM and the system-GMM estimators are relatively similar, it is plausible to use the difference-GMM estimator in this thesis.

Secondly, the partisan effects on the net PATR for the different household groups is shown in Table 5.2. The partisan effect is examined by including the government ideology variables, and these are whether the incumbent government is a right- or left-wing party. In other words, Equation (4.1) now only excludes the interaction terms between the government ideologies and the *Election* variable. Similar to Table 5.1, it can be seen that there is a negative and significant electoral effect on the PATR for the household group HT1 in Table 5.2. As regards to ideology variables, there is evidence that the right-wing party engages in tax cuts for household group HT7, while the left-wing party increases the PATR for the household group HT8. As mentioned in Chapter 4, these suggest that the right-wing party puts much emphasis on taxation as compared to the left-wing party, which is likely to focus on government spending. The remaining control variables tend to follow a similar trend as that of Table 5.1.

Table 5.2: Partisan Effect on the net PATRs for all Household Groups

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.308*	-0.156	-0.141	-0.093	-0.073	-0.044	-0.095	-0.221	-0.139	-0.042	-0.053	-0.032	0.024
	(0.172)	(0.135)	(0.129)	(0.128)	(0.123)	(0.093)	(0.469)	(0.203)	(0.148)	(0.130)	(0.155)	(0.124)	(0.112)
Right-wing	-0.599	-0.536	-0.418	-0.354	-0.297	-0.208	-1.230*	0.0914	0.0148	-0.0375	-0.365	-0.311	-0.143
	(0.537)	(0.418)	(0.352)	(0.311)	(0.305)	(0.266)	(0.730)	(0.510)	(0.525)	(0.382)	(0.695)	(0.413)	(0.287)
Left-wing	-0.043	-0.185	-0.072	-0.205	-0.107	0.133	0.305	1.017*	0.592	0.390	-0.527	-0.174	-0.164
	(0.508)	(0.388)	(0.337)	(0.324)	(0.330)	(0.343)	(0.761)	(0.562)	(0.522)	(0.413)	(0.942)	(0.368)	(0.279)
Coalition	0.284	0.506	0.468	0.834	0.872	0.826	0.399	0.529	0.667	0.363	0.644	0.815	0.876
	(0.380)	(0.450)	(0.420)	(0.570)	(0.609)	(0.566)	(0.507)	(0.742)	(0.631)	(0.562)	(0.639)	(0.511)	(0.593)
Lagged PATR	0.730***	0.739***	0.667***	0.672***	0.714***	0.751***	0.851***	0.620***	0.651***	0.514**	0.299	0.604**	0.386
	(0.158)	(0.176)	(0.217)	(0.184)	(0.260)	(0.236)	(0.186)	(0.127)	(0.150)	(0.218)	(0.239)	(0.236)	(0.242)
Control Variables:													
ln *GDP*	-12.02**	-2.287	0.458	6.579	9.385	12.91**	-11.12	-2.256	-0.0843	-13.90	-7.839	-3.553	-2.920
	(5.639)	(3.425)	(3.648)	(4.716)	(6.225)	(6.025)	(22.41)	(6.285)	(5.895)	(9.868)	(9.850)	(5.553)	(5.517)
ln *GDP per capita*	10.10*	-0.0528	-4.048	-10.88**	-13.55**	-16.41**	6.651	-3.432	-4.432	9.593	2.707	0.700	-1.630
	(5.541)	(3.392)	(4.007)	(5.171)	(6.486)	(6.506)	(18.10)	(6.335)	(5.070)	(9.684)	(9.490)	(5.519)	(5.753)
GDP growth	-3.487	-4.680	-5.105	-3.125	-4.219	-4.741	-7.355	-5.386	-7.131*	-5.683	-1.335	1.108	0.634
	(4.371)	(4.136)	(4.097)	(4.102)	(4.236)	(3.320)	(7.875)	(4.465)	(4.224)	(3.737)	(2.976)	(4.201)	(3.664)
ln *Inflation*	-0.072	-0.060	-0.070	-0.072	-0.084	-0.072	0.340	0.030	0.031	0.072	0.038	-0.053	-0.002
	(0.082)	(0.065)	(0.063)	(0.057)	(0.065)	(0.067)	(0.225)	(0.088)	(0.095)	(0.078)	(0.060)	(0.055)	(0.046)
Govt exp	3.921	1.120	-1.020	-2.624	-3.257	-1.133	-7.027	-3.641	2.135	0.629	-0.265	3.850	-1.008
	(4.240)	(3.735)	(3.610)	(3.727)	(3.664)	(3.628)	(11.56)	(7.064)	(6.674)	(3.775)	(3.963)	(3.273)	(2.697)
Pop14	-0.200	-0.148	-0.213	-0.308*	-0.235	-0.158	-0.445	-0.283	-0.362	-0.326	-0.396	-0.111	-0.359
	(0.201)	(0.178)	(0.178)	(0.173)	(0.195)	(0.200)	(0.578)	(0.361)	(0.346)	(0.238)	(0.244)	(0.216)	(0.227)
Pop64	-0.214	-0.051	0.033	0.004	0.021	0.011	-0.494	0.068	-0.061	0.134	0.174	0.005	0.138
	(0.192)	(0.156)	(0.157)	(0.133)	(0.169)	(0.182)	(0.501)	(0.232)	(0.198)	(0.180)	(0.224)	(0.152)	(0.153)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	13	13	13	13	13	13	13	13	13	13	13	13	13
AR (1) p-value	0.026	0.026	0.073	0.033	0.057	0.055	0.001	0.002	0.006	0.047	0.123	0.081	0.135
AR (2) p-value	0.586	0.920	0.775	0.223	0.270	0.173	0.529	0.297	0.815	0.994	0.795	0.324	0.591
Hansen p-value	0.347	0.379	0.190	0.407	0.251	0.486	0.421	0.449	0.153	0.200	0.851	0.097	0.985

Notes: Estimation of Equation (4.1) using the difference-GMM estimator. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election and ideology dummies, and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. The reference country is Luxembourg.

5.2.2 *Opportunistic Partisan Effect on the net PATRs*

While the electoral and partisan effects are accounted for separately in Section 5.2.1, in this section, the interaction between the election and government ideologies variables are taken into account. More specifically, the findings of Equation (4.1) are presented in Table 5.3, where the focus is on whether the different government ideologies behave in an opportunistic manner and target particular household groups in the run-up to an election.

The opportunistic partisan effects are captured by the interaction terms between the variable *Election* and the ideology variables *Right-wing* and *Left-wing*; these are shown by the variables *Election: Right* and *Election: Left*. The inclusion of the interaction terms imply that the coefficient of *Election* shows the electoral effect for the base group, that is, the centre-of party. As such the electoral effect on the PATR when the right-wing (left-wing) party is in office is calculated by adding the coefficients of *Election* and *Election: Right* (*Election: Left*). The interaction terms capture the significant difference from the centre-of party. Moreover, since the base group is the centre-of party, when including the country fixed effects, Luxembourg is chosen as the reference country as it has a centre-of party over the 1996-2016 period. In Table 5.3, the *Election* term has a positive and significant effect on the PATR for the household group HT10, which consists of married couples with two children. This indicates that in the run-up to an election, the centre-of incumbent increases the PATR. With regard to the opportunistic partisan effects, the results in Table 5.3 show that in the run-up to elections, both right- and left-wing parties manipulate the PATR for the married-couple households with two children. Specifically, the right-wing parties decrease the PATR for the groups HT8, and the left-wing parties cut it for groups HT8 to HT11, which have different earnings levels. The negative coefficient estimates of the interaction terms between the government ideologies and *Election* suggest that both the right- and left-wing parties engage in a partisan opportunistic behaviour by decreasing the net PATRs in the run-up to an election as compared to the centre-of party.

As regards the other variables, there is no evidence that the right-wing government has an effect on the PATR, while the left-wing government increases the PATR for the household groups HT8 and HT9, which are married-couple households with two children. The coalition dummy variable has no significant effect on the PATR. In all cases, but with the exception of group HT11, the lagged dependent variable is significant. The sign on the coefficient estimates of the remaining control variables tend to be similar to that in Tables 5.1 and 5.2.

Table 5.3: Difference-GMM Estimations for all Household Groups

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.232	0.017	0.089	0.014	0.016	0.013	0.770	0.606	0.481	0.420*	0.230	0.158	0.177
	(0.253)	(0.150)	(0.133)	(0.125)	(0.118)	(0.124)	(1.445)	(0.396)	(0.361)	(0.242)	(0.275)	(0.133)	(0.195)
Election: Right	-0.137	-0.249	-0.326	-0.086	-0.141	-0.024	-1.004	-1.110*	-0.864	-0.608	-0.041	-0.255	-0.044
	(0.382)	(0.330)	(0.332)	(0.306)	(0.310)	(0.218)	(1.666)	(0.674)	(0.550)	(0.421)	(0.479)	(0.344)	(0.366)
Election: Left	-0.072	-0.219	-0.311	-0.206	-0.114	-0.130	-1.235	-1.148*	-0.829*	-0.657*	-0.705**	-0.295	-0.360
	(0.384)	(0.276)	(0.248)	(0.309)	(0.286)	(0.231)	(1.564)	(0.589)	(0.457)	(0.342)	(0.352)	(0.300)	(0.322)
Right-wing	-0.530	-0.403	-0.239	-0.294	-0.219	-0.185	-0.735	0.594	0.386	0.249	-0.324	-0.174	-0.104
	(0.543)	(0.461)	(0.403)	(0.407)	(0.378)	(0.335)	(1.089)	(0.606)	(0.586)	(0.487)	(0.840)	(0.490)	(0.353)
Left-wing	-0.022	-0.091	0.069	-0.110	-0.064	0.194	0.920	1.497**	0.916*	0.667	-0.160	-0.063	0.029
	(0.484)	(0.391)	(0.351)	(0.332)	(0.346)	(0.363)	(1.050)	(0.611)	(0.526)	(0.432)	(0.896)	(0.365)	(0.289)
Coalition	0.273	0.494	0.467	0.850	0.870	0.832	0.425	0.561	0.681	0.373	0.663	0.826	0.888
	(0.368)	(0.437)	(0.411)	(0.570)	(0.606)	(0.565)	(0.479)	(0.722)	(0.625)	(0.557)	(0.635)	(0.508)	(0.595)
Lagged PATR	0.722***	0.721***	0.642***	0.655***	0.698***	0.731***	0.843***	0.612***	0.643***	0.499**	0.274	0.581**	0.368
	(0.170)	(0.189)	(0.228)	(0.185)	(0.267)	(0.233)	(0.186)	(0.127)	(0.148)	(0.218)	(0.237)	(0.242)	(0.241)
Control Variables:													
ln *GDP*	-11.97**	-2.450	0.136	6.330	9.100	12.55**	-10.85	-2.706	-0.517	-14.12	-8.127	-3.688	-3.077
	(5.726)	(3.574)	(3.795)	(4.674)	(6.310)	(6.017)	(22.57)	(6.553)	(6.080)	(10.14)	(10.34)	(5.792)	(5.756)
ln *GDP per capita*	10.04*	0.101	-3.764	-10.66**	-13.33**	-16.09**	6.479	-3.048	-4.071	9.722	2.992	0.819	-1.497
	(5.629)	(3.561)	(4.176)	(5.161)	(6.572)	(6.582)	(18.43)	(6.546)	(5.246)	(9.982)	(10.03)	(5.815)	(6.031)
GDP growth	-3.213	-4.372	-4.756	-2.985	-3.961	-4.539	-7.200	-5.287	-6.790	-5.462	-1.552	1.394	0.525
	(4.289)	(4.101)	(4.004)	(4.101)	(4.219)	(3.351)	(8.391)	(4.559)	(4.235)	(3.729)	(2.970)	(4.010)	(3.565)
ln *Inflation*	-0.074	-0.062	-0.074	-0.073	-0.085	-0.070	0.313	0.017	0.022	0.060	0.033	-0.058	-0.005
	(0.080)	(0.062)	(0.062)	(0.057)	(0.066)	(0.067)	(0.244)	(0.091)	(0.096)	(0.078)	(0.062)	(0.054)	(0.046)
Govt exp	4.049	1.124	-1.062	-2.757	-3.263	-1.161	-8.368	-4.603	1.808	0.391	-0.754	3.719	-1.364
	(4.055)	(3.624)	(3.461)	(3.766)	(3.608)	(3.594)	(11.95)	(7.056)	(6.627)	(3.748)	(4.253)	(3.264)	(2.818)
Pop14	-0.194	-0.147	-0.218	-0.320*	-0.243	-0.167	-0.448	-0.288	-0.363	-0.342	-0.431*	-0.107	-0.380*
	(0.200)	(0.179)	(0.183)	(0.175)	(0.201)	(0.194)	(0.581)	(0.366)	(0.349)	(0.238)	(0.241)	(0.223)	(0.227)
Pop64	-0.209	-0.047	0.037	-0.001	0.024	0.009	-0.547	0.073	-0.051	0.127	0.150	0.008	0.126
	(0.191)	(0.151)	(0.157)	(0.131)	(0.167)	(0.183)	(0.512)	(0.230)	(0.192)	(0.176)	(0.237)	(0.155)	(0.161)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	15	15	15	15	15	15	15	15	15	15	15	15	15
AR (1) p-value	0.029	0.031	0.081	0.035	0.062	0.058	0.001	0.002	0.007	0.050	0.139	0.090	0.140

AR (2) p-value	0.544	0.805	0.679	0.214	0.263	0.165	0.579	0.247	0.754	0.997	0.828	0.344	0.637
Hansen p-value	0.344	0.395	0.199	0.430	0.253	0.510	0.457	0.498	0.156	0.206	0.910	0.103	0.959

Notes: Estimation of Equation (4.1) using the difference-GMM estimator. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. *Election*, *Election: Right* and *Election: Left* are measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election and ideology dummies, the interaction terms and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. The reference country is Luxembourg.

5.3 Robustness Checks

The difference-GMM results suggest that both right- and left-wing parties target the household groups consisting of married couples by decreasing their PATR in the run-up to elections. In this section, I test the robustness of this finding in several ways. First, I consider the measurement of the *Election* variable itself. The purpose is to examine how the exact timing of the election is taken into account affect the results, drawing on the approach widely used in the literature. Second, I differentiate between pre-determined and other elections. As seen in Chapter 3, an election may occur outside of the constitutionally fixed period, so that an incumbent may not have enough time to manipulate the fiscal policies. Finally, since different countries have different proportions of the household types I weight the PATR terms to allow for this. For example, it might be that all governments target less well-off households in the run-up to an election, but if any given country has only a small proportion of these households then the measured effect will be small, but influencing the cross-country estimate, so that weighting is potentially important. By not weighting the data all household groups are given the same weight regardless of their size.

5.3.1 *The Election Date*

So far, the *Election* dummy variable that captures the period before the election is measured as unity in the election year, but zero otherwise, which is irrespective of what time during the year the election is held. However, since it takes time for fiscal policy decisions to have an effect, then this could bias the estimate. For example, if the election takes place late in the year, then *Election* is able to capture the pre-electoral effects, but if the election takes place early in the year (i.e., during the first half of the year), then it may just capture the effects after the election, which makes the interpretation problematic (Katsimi and Sarantides, 2012; Ehrhart, 2013).

To tackle this issue, I construct an alternative electoral indicator that follows Drazen and Eslava (2010). The new election variables is measured on a monthly basis, with the creation of two new variables: $Election_t = {}^{x}/_{12}$ and $Election_{t-1} = {}^{(12-x)}/_{12}$, where x is the month the election is held and t is the election year, but zero if there is no election in that year (Angelopoulos and Economides, 2008; Klomp and de Haan, 2013a, b). For example, if an election takes place in April, $Election_t = {}^{4}/_{12}$ and $Election_{t-1} = {}^{8}/_{12}$, so that the variable *Election*$_t$ captures the share of the months in the year leading up to the election in the election

Table 5.4: Effect of Election on Net PATR: New Election Variable

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election$_{t-1}$	0.013	0.160	0.178	0.091	0.114	0.154	-1.875	0.441	-0.011	-0.123	-0.099	0.007	0.101
	(0.354)	(0.340)	(0.322)	(0.346)	(0.316)	(0.283)	(3.082)	(0.722)	(0.623)	(0.454)	(0.455)	(0.340)	(0.404)
Election$_{t}$	2.441	1.446	0.940	0.737	0.742	0.796	-4.968**	-1.023	-1.438	-1.181*	-0.712	0.254	0.011
	(1.584)	(1.360)	(1.334)	(1.138)	(1.159)	(0.994)	(2.380)	(0.847)	(0.977)	(0.634)	(0.499)	(1.171)	(0.837)
Election: Right$_{t-1}$	-1.763*	-1.475*	-1.419	-0.675	-0.769	-0.461	-1.208	-2.483**	-1.956	-1.259	-0.218	-0.946	-0.215
	(1.007)	(0.812)	(0.881)	(0.704)	(0.726)	(0.465)	(3.333)	(1.256)	(1.212)	(0.962)	(0.912)	(0.876)	(0.727)
Election: Left$_{t-1}$	-0.510	-0.544	-0.582	-0.274	-0.356	-0.386	-1.738	-2.254**	-1.124*	-1.028**	-1.069*	-0.233	-0.367
	(0.557)	(0.449)	(0.421)	(0.454)	(0.446)	(0.390)	(3.187)	(0.961)	(0.669)	(0.457)	(0.584)	(0.462)	(0.502)
Election: Right$_{t}$	-3.176**	-2.118	-1.460	-1.003	-1.039	-0.973	3.464	0.268	0.553	0.519	0.154	-0.646	-0.217
	(1.511)	(1.302)	(1.317)	(1.064)	(1.117)	(0.960)	(2.292)	(1.088)	(1.205)	(0.698)	(0.468)	(1.087)	(0.787)
Election: Left$_{t}$	-2.909*	-1.952	-1.294	-0.889	-1.401	-1.370	1.612	-0.282	0.692	0.281	0.537	-0.351	-0.0777
	(1.744)	(1.498)	(1.499)	(1.225)	(1.395)	(1.194)	(2.411)	(1.120)	(1.116)	(0.825)	(0.548)	(1.325)	(0.941)
Right-wing	-0.094	-0.126	-0.022	-0.164	-0.072	-0.058	-1.200	0.745	0.454	0.227	-0.285	-0.109	-0.090
	(0.504)	(0.434)	(0.393)	(0.407)	(0.376)	(0.311)	(1.201)	(0.579)	(0.542)	(0.481)	(0.787)	(0.480)	(0.360)
Left-wing	0.136	-0.029	0.092	-0.153	0.017	0.265	0.689	1.578***	0.790*	0.588	-0.242	-0.206	-0.097
	(0.460)	(0.377)	(0.351)	(0.351)	(0.343)	(0.359)	(1.143)	(0.608)	(0.478)	(0.437)	(0.789)	(0.355)	(0.319)
Coalition	0.340	0.532	0.491	0.857	0.877	0.861	0.564	0.651	0.715	0.439	0.670	0.845	0.887
	(0.408)	(0.486)	(0.455)	(0.599)	(0.649)	(0.588)	(0.576)	(0.776)	(0.667)	(0.608)	(0.655)	(0.536)	(0.616)
Lagged PATR	0.752***	0.744***	0.645**	0.664***	0.699**	0.753***	0.888***	0.596***	0.626***	0.495**	0.236	0.595**	0.364
	(0.193)	(0.205)	(0.263)	(0.200)	(0.306)	(0.283)	(0.180)	(0.127)	(0.148)	(0.218)	(0.233)	(0.249)	(0.245)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	19	19	19	19	19	19	19	19	19	19	19	19	19
AR (1) p-value	0.035	0.036	0.102	0.041	0.082	0.080	0.001	0.002	0.007	0.053	0.156	0.090	0.147
AR (2) p-value	0.587	0.710	0.627	0.224	0.278	0.196	0.418	0.190	0.931	0.723	0.885	0.333	0.623
Hansen p-value	0.316	0.850	0.194	0.412	0.223	0.434	0.446	0.536	0.183	0.245	0.887	0.112	0.989

Notes: Re-estimation of results in Table 5.5 with new election variable (see Section 5.3.2). See also notes to Table 5.5.

year and $Election_{t-1}$ is for the share of the twelve months in the pre-election year. The estimates for difference-GMM using these new election variables are presented in Table 5.4.

Similar to Table 5.3, there is evidence that both the right- and left-wing governments decrease the PATR for some of the household groups in the run-up to an election. As compared to the centre-of party, the right-wing party tend to target both the single-individual (HT1 and HT2) and married-couple (HT8) household groups, while the left-wing government decreases the PATR for the married-couple household groups (HT8 to HT11) only. As such, regardless of the month in which an election takes place, the estimates on the interaction dummy variables continue to have similar signs, although the coefficient estimates tend to be larger in Table 5.4 than in Table 5.3. Using *p*-values to compare the results in Table 5.4 with Table 5.3, the original election dummy variable seems to perform similar to the new alternative election variables, $Election_t$ and $Election_{t-1}$. Consequently, I continue to use the original *Election* dummy variable in the remainder of this chapter.

5.3.2 *Pre-Determined Elections*

The election dates may not be exogenous if unforeseen and therefore unexpected events occur, such as those discussed in Chapter 3, i.e., economic conditions, coalition collapse or stochastic events. Treating all elections as pre-determined may bias the causal relationship between the elections and the PATR. As we have seen in Chapter 2, the issue of endogneous elections is well-known in the literature (Efthyoulou, 2012; Katsimi and Sarantides, 2012; Ehrhart, 2013). Further, Chapter 3 argues that the incumbent may choose the timing of an election strategically to benefit from favourable conditions. If the election is unexpected then the incumbent may not have sufficient foresight to manipulate the fiscal policies in the run-up to an election. The results for the difference-GMM estimator are shown in Table 5.5, where I distinguish between pre-determined (*Election: Pre-Determined*) and the non-pre-determined elections (*Election: Other*). Again, I focus the discussion on the interaction terms and political variables.

Table 5.5: Difference-GMM Estimations: Pre-Determined and Other Elections

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election: Pre-	-0.252	0.016	0.096	0.005	0.005	-0.004	0.618	0.376	0.431	0.424	0.258	0.188	0.185
Determined	(0.283)	(0.161)	(0.140)	(0.137)	(0.130)	(0.131)	(1.625)	(0.389)	(0.373)	(0.277)	(0.290)	(0.178)	(0.223)
Election: Other	-0.137	-0.052	0.010	0.122	0.131	0.135	1.572	1.650	0.725	0.217	-0.041	-0.049	0.123
	(0.344)	(0.278)	(0.244)	(0.201)	(0.209)	(0.190)	(3.052)	(1.333)	(0.995)	(0.284)	(0.331)	(0.396)	(0.158)
Right: Pre-	-0.039	-0.155	-0.342	-0.186	-0.250	-0.023	-0.609	-0.663	-0.647	-0.581	-0.143	-0.306	-0.180
Determined	(0.554)	(0.462)	(0.451)	(0.356)	(0.362)	(0.268)	(1.869)	(0.703)	(0.630)	(0.536)	(0.526)	(0.432)	(0.412)
Right: Other	-0.448	-0.400	-0.250	0.063	-0.011	-0.117	-2.254	-2.504	-1.463	-0.418	0.248	0.087	0.170
	(0.345)	(0.262)	(0.264)	(0.323)	(0.313)	(0.245)	(4.099)	(2.023)	(1.462)	(0.488)	(0.493)	(0.426)	(0.296)
Left: Pre-	-0.319	-0.460	-0.574**	-0.491	-0.428	-0.387*	-1.422	-1.295**	-1.066**	-1.089***	-1.104***	-0.546	-0.637*
Determined	(0.411)	(0.288)	(0.263)	(0.322)	(0.268)	(0.218)	(1.714)	(0.509)	(0.430)	(0.309)	(0.393)	(0.342)	(0.342)
Left: Other	0.695	0.635	0.573	0.644	0.821	0.678	-0.882	-0.883	-0.156	0.870	0.802	0.567	0.626
	(0.706)	(0.632)	(0.544)	(0.526)	(0.553)	(0.550)	(3.308)	(1.673)	(1.336)	(0.734)	(0.712)	(0.734)	(0.560)
Right-wing	-0.527	-0.415	-0.238	-0.270	-0.197	-0.159	-0.720	0.616	0.373	0.189	-0.348	-0.177	-0.079
	(0.530)	(0.457)	(0.410)	(0.395)	(0.377)	(0.319)	(1.104)	(0.648)	(0.586)	(0.504)	(0.817)	(0.471)	(0.341)
Left-wing	-0.107	-0.177	-0.026	-0.207	-0.176	0.104	0.845	1.404**	0.834	0.489	-0.345	-0.134	-0.076
	(0.481)	(0.399)	(0.363)	(0.337)	(0.362)	(0.361)	(1.149)	(0.692)	(0.567)	(0.463)	(0.905)	(0.363)	(0.295)
Coalition	0.286	0.525	0.511	0.909*	0.934*	0.859*	0.370	0.558	0.734	0.510	0.716	0.926*	0.928*
	(0.353)	(0.414)	(0.386)	(0.532)	(0.558)	(0.518)	(0.488)	(0.686)	(0.585)	(0.507)	(0.577)	(0.481)	(0.557)
Lagged PATR	0.740***	0.731***	0.651***	0.646***	0.699***	0.707***	0.838***	0.635***	0.658***	0.527**	0.292	0.574**	0.374
	(0.167)	(0.191)	(0.222)	(0.186)	(0.264)	(0.226)	(0.173)	(0.137)	(0.144)	(0.209)	(0.241)	(0.237)	(0.241)
Control Variables:													
ln *GDP*	-11.81**	-2.566	-0.273	5.448	8.235	11.27*	-10.75	-1.475	-0.379	-13.89	-8.950	-4.114	-3.806
	(5.964)	(3.663)	(3.857)	(4.704)	(6.386)	(5.978)	(22.75)	(6.674)	(5.904)	(10.37)	(10.54)	(6.051)	(5.929)
ln *Per capita*	9.928*	0.381	-3.392	-10.11*	-12.83*	-15.11**	6.394	-4.315	-4.037	9.523	3.655	1.100	-1.059
GDP	(5.753)	(3.546)	(4.213)	(5.288)	(6.732)	(6.500)	(18.61)	(6.525)	(5.172)	(10.16)	(10.26)	(6.108)	(6.194)
GDP growth	-3.578	-4.688	-5.106	-3.158	-4.349	-4.575	-7.416	-6.517	-7.702*	-6.574*	-2.428	0.912	-0.005
	(4.295)	(4.138)	(3.986)	(3.982)	(4.106)	(3.263)	(8.524)	(5.104)	(4.390)	(3.777)	(3.006)	(3.957)	(3.487)
ln *Inflation*	-0.083	-0.070	-0.079	-0.073	-0.087	-0.069	0.303	0.004	0.014	0.051	0.023	-0.058	-0.010
	(0.082)	(0.065)	(0.063)	(0.059)	(0.066)	(0.070)	(0.239)	(0.087)	(0.095)	(0.077)	(0.059)	(0.055)	(0.046)
Govt exp	3.375	0.792	-1.673	-4.056	-4.778	-2.289	-9.677	-7.025	0.362	-1.062	-2.290	2.894	-2.777
	(4.561)	(4.210)	(3.961)	(4.243)	(4.024)	(3.890)	(11.44)	(7.881)	(6.964)	(4.367)	(4.448)	(3.604)	(3.171)
Pop14	-0.178	-0.123	-0.203	-0.328*	-0.248	-0.177	-0.462	-0.301	-0.343	-0.317	-0.408*	-0.105	-0.379*

	(0.205)	(0.189)	(0.191)	(0.181)	(0.209)	(0.199)	(0.566)	(0.350)	(0.337)	(0.242)	(0.244)	(0.220)	(0.228)
Pop64	-0.212	-0.056	0.050	0.034	0.062	0.038	-0.565	0.049	-0.067	0.133	0.182	0.027	0.162
	(0.194)	(0.151)	(0.157)	(0.129)	(0.165)	(0.187)	(0.470)	(0.202)	(0.165)	(0.166)	(0.244)	(0.154)	(0.165)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	18	18	18	18	18	18	18	18	18	18	18	18	18
AR (1) p-value	0.025	0.029	0.073	0.037	0.060	0.061	0.001	0.002	0.006	0.038	0.127	0.087	0.135
AR (2) p-value	0.484	0.692	0.572	0.202	0.225	0.147	0.544	0.200	0.864	0.561	0.884	0.372	0.738
Hansen p-value	0.404	0.504	0.249	0.508	0.300	0.620	0.418	0.790	0.223	0.313	0.982	0.126	0.881

Notes: Estimation of Equation (4.1) using the difference-GMM estimator, distinguishing between pre-determined and non-pre-determined (*Other*) elections (see Section 5.3.3). Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. Election variables measured for the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: lagged dependent variable is lagged with first-order to second-order lags. The election and ideology dummies, the interaction terms and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. The reference country is Luxembourg.

First, there is no evidence that the centre-of governments engage in PATR cuts in the run-up to an election, irrespective of whether the election dates are pre-determined or not. Second, with regard to opportunistic partisan effects, when the election dates are pre-determined, the results in Table 5.5 reveal that the right-wing governments do not engage in electoral manipulations of the PATR, but that there is evidence that the left-wing governments decrease the PATR for both single and married-couple households, i.e., HT3, HT6, HT8 to HT11 and HT13 as compared to the centre-of party. The diagnostic tests in Table 5.5 indicate that when pre-determined and other elections are differentiated there is no second-order autocorrelation and that the instruments used are valid.

It is concluded therefore that a left-wing government displays partisan opportunistic behaviour because when the election date is not pre-determined there is no significant electoral effect on the PATR, but when it is pre-determined the coefficient estimates of the PATR are statistically significant and negative. The results partly confirm the difference-GMM findings in Table 5.3, with respect to the left-wing party targeting the household groups consisting of married couples with two children, but there is no evidence that a right-wing party engages in electoral manipulations of the PATRs, irrespective of whether the election is pre-determined or not. There is also no evidence that coalition governments manipulate the PATR. The lagged dependent variable has a positive and significant effect, but not for all household groups.

5.3.3 *Weighted Estimates*

The PATR is known for each of thirteen different household groups for each country. According to Johnson *et al*. (2005), these groups represent hypothetical households and in the above analysis they are given equal weight. In order to have a true representation of the household groups, it is necessary to weight the PATRs by the proportion of households of each type in each country, that is, the number of single individuals, number of married couples and so on. This is done as the proportion of household groups may differ across the EU26 countries, potentially biasing the estimates. For instance, the share of voters in HT1 may be very large in a few countries, but small in many others, but leading to an insignificant estimate of its effect in the unweighted data since each of the household groups is given an equal weight in each country. By weighting the data, I allow for the importance of the different household groups in each country, and this will potentially give more reliable estimates of the *Election* variables.

As mentioned in Chapter 4, in order to weight the data, it is necessary to weight each household group according to their representation within the country. This information is not readily available for each of the 26 European Union countries, so what I do reflects the available data, and is

as follows: household groups HT1 to HT6 are weighted by the number of single individuals with no children; HT7 by the number of single individuals with two children; HT8 to HT11 by the number of married couples with two children; and HT12 and HT13 by the number of married couples with no children. The data are available for these over the 2010-16 period for all of the EU26 member countries, so the number of observations is decreased to 156, which is further reduced to 130 owing to the missing observations when taking the log of *Inflation* as the inflation rate is negative in some cases. The weights are described in Tables 4.3(a) and 4.3(b) of Chapter 4, which shows that across the EU26 countries, there is a high number of married couples with two children (HT8 to HT11), followed by married couples with no children (HT12 to HT13) and single individuals with no children (HT1 to HT6), and finally single individuals with two children (HT7).

The weighted PATRs results are given in Table 5.6 using the difference-GMM estimator. This is again for the smaller sample, and only the interaction terms, ideologies and political variables are presented. Diagnostic tests indicate there is no second-order serial autocorrelation and the Hansen test indicates that valid instruments have been used at the 5% significance level. The coefficient estimate of the lagged dependent variable is positive and significant for most of the groups, with the exception of HT8 to HT11. Table 5.6 shows that the centre-of party increases the PATR for the group of married couples with two children (HT8), which is similar to the difference-GMM results in Table 5.3, although for a different household group. There is also evidence that only the right-wing party, as compared to the centre-of party, engages in electoral PATR cuts for household groups HT5 and HT6, which consist of single individuals with no children. From Tables 4.3(a) and 4.3(b), it can be seen that, across the EU26, the mean number of married couples with two children is the highest, and so it might be expected that on weighting the PATRs, the findings will indicate that the government is likely to target the household groups that make the most of the population. This is, however, not the case. A possible explanation for the negative effect of *Election: Right* on the PATR for HT5 and HT6 could be that the right-wing party targets the high-income earners and the individuals in household groups HT5 and HT6 earn over 50% of average earnings, so that they can be considered as the high-income earners.

Table 5.6: Effect of Election on the Net PATRs: Weighted Net PATRs

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	0.300	0.400	0.473	0.346	0.310	0.234	-1.664	0.951*	0.420	0.221	0.163	0.504	0.521
	(0.770)	(0.707)	(0.574)	(0.373)	(0.422)	(0.367)	(7.629)	(0.536)	(0.398)	(0.291)	(0.268)	(0.559)	(0.580)
Election: Right	-0.676	-1.239	-1.455	-1.645	-1.759**	-1.679**	-4.152	-0.713	0.105	0.497	0.185	0.401	0.620
	(1.087)	(1.251)	(1.162)	(1.039)	(0.888)	(0.698)	(5.294)	(0.763)	(0.633)	(0.894)	(0.773)	(0.763)	(0.781)
Election: Left	-0.010	-0.183	-0.232	0.136	0.256	0.269	-1.762	-0.539	-0.524	-0.351	-0.300	-1.077	-1.003
	(1.330)	(1.180)	(0.945)	(0.695)	(0.805)	(0.707)	(6.385)	(0.820)	(0.731)	(0.708)	(0.664)	(0.678)	(0.744)
Right-wing	2.147	2.106	2.309	1.334	1.544	1.572*	3.826	-0.416	-0.154	-0.646	-0.675	-1.023	-2.461**
	(3.970)	(2.780)	(2.111)	(1.006)	(1.062)	(0.877)	(4.329)	(1.050)	(0.896)	(0.876)	(0.838)	(1.168)	(1.208)
Left-wing	1.541	0.928	0.849	-0.0163	-0.0619	-0.275	0.284	0.026	0.656	0.669	0.404	3.069***	2.798***
	(2.805)	(2.263)	(1.699)	(0.673)	(0.666)	(0.496)	(2.963)	(0.355)	(0.640)	(0.592)	(0.354)	(0.896)	(0.837)
Coalition	0.266	0.097	0.078	0.167	0.070	0.166	-4.864*	0.754	0.487	0.325	0.159	0.213	0.138
	(1.286)	(0.811)	(0.615)	(0.620)	(0.734)	(0.653)	(2.902)	(0.946)	(0.715)	(0.830)	(0.657)	(1.152)	(1.186)
Lagged PATR	1.205***	1.296***	1.192***	1.155***	1.099***	0.855***	-6.032**	0.567	0.508	0.584	0.199	1.218***	1.233***
	(0.341)	(0.469)	(0.318)	(0.254)	(0.236)	(0.203)	(2.814)	(0.893)	(0.606)	(0.802)	(0.543)	(0.188)	(0.253)
No. of obs.	102	102	102	102	102	102	102	102	102	102	102	102	102
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	15	15	15	15	15	15	15	15	15	15	15	15	15
AR (1) p-value	0.158	0.104	0.058	0.044	0.088	0.113	0.563	0.563	0.431	0.663	0.901	0.086	0.070
AR (2) p-value	0.323	0.902	1.000	0.257	0.211	0.213	0.963	0.251	0.203	0.711	0.383	0.368	0.454
Hansen Test p-value	0.052	0.231	0.345	0.556	0.899	0.590	0.283	0.331	0.246	0.253	0.448	0.971	0.963

Notes: Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. *Election, Election: Right* and *Election: Left* are measured in the election year. Control variables (lagged one period) included but not shown. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election and ideology dummies, the interaction terms and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. The reference country is Luxembourg.

Overall, the difference-GMM results indicate that the governments are likely to target the household groups consisting of single individuals with no children, although from Tables 4.3(a) and 4.3(b), it can be seen that of the four household categories (single individuals with either none or two children, and married couples with either none or two children), the number of single individuals with no children is the third highest group. Equation (4.1) was regressed for the shorter period 2010-16 when the net PATRs are not weighted, and the difference-GMM regressions in Appendix Table 5.6 show that there is no evidence of opportunistic partisan effects in the PATR.

5.4 Conclusions

This chapter examines the effects of election and the partisan electoral effects on the net Personal Average Tax Rate (PATR) in the EU26 member countries over the period from 1996 to 2016. Using different estimators it examines whether the incumbent governments undertake opportunistic behaviour in the run-up to elections, and whether the incumbents of different ideologies target particular groups of voters in the run-up to elections. In order to test these, I use the PATRs, which are available for thirteen different household groups, consisting of either single individuals or married couples with different family sizes or income.

In the run-up to an election, the centre-of government is likely to increase the PATR, although this is significant only for the household group HT10. The findings further indicate that there is evidence of partisan opportunistic effects, suggesting that both right- and left-wing parties engage in electoral manipulations of the PATRs by decreasing these prior to an election. These tax reductions are focused on household groups consisting of the married couples with two children, which form a large share of the population across the EU member countries. In the case of the left-wing party it is generally supposed that it puts greater emphasis on public expenditure than tax cuts, but the results also indicate that it decreases the PATRs in the run-up to an election in an attempt to influence voters.

As part of robustness tests carried out to test the main findings, pre-determined elections are distinguished from those that are not pre-determined. It is reasonable that an incumbent government has sufficient time to manipulate fiscal policy to increase its re-election chances when the election dates are pre-determined. On differentiating between these elections, I find that there is no evidence that the right-wing party engages in electoral tax cuts when the election dates are pre-determined, but that a left-wing party still decreases the PATRs prior to an election for some of the household groups. These are single individuals with no children and the married couples with two children at different income levels. Since a left-wing government focuses on

public spending and relies on taxation to finance this, the result is unexpected, but it is robust. Thus, when election dates are pre-determined, I find that a left-wing party in office will adopt a policy that is different to its ideology in order to increase its re-election chances.

With regards to the PATRs that are available for different household groups, these are not necessarily representative of the population in any country. Consequently, as part of the robustness tests, the PATRs are weighted by the number of single individuals with either none or two children and the number of married couples with either none or two children, relative to the EU average. The empirical analyses are carried out using a sample of the EU26 member countries but for the period 2010-16 as compared to the original period 1996-2016. The smaller sample size is due to the data availability for the number of single individuals or married couples with either none or two children. These results suggest that there is a positive electoral effect on the PATR by the centre-of party, this is similar to the main findings, although not for the same household groups. There is also evidence that the right-wing party engages in the electoral cut of the PATRs for the household groups consisting of single individuals with no children (HT5 and HT6), while the above findings hold for the household group consisting of married couples with two children (HT8). It should be noted that, from Chapter 4, the number of married couples with two children is the largest of the four groups, so that the right-wing party is aware of which part of the population to target in the run-up to an election.

Overall, the findings of this chapter provide evidence that the partisan opportunistic behaviour in the PATRs across the EU26 member countries over the period from 1996 to 2016, while there is a positive opportunistic electoral effect on the PATRs. Given the presence of the partisan electoral cycles, in the next chapter the objective is to examine whether the election-year manipulations in the PATRs have an effect on the vote share of the government.

Chapter 6. Income Tax Rates and Electoral Accountability

6.1 Introduction

As reviewed in Chapter 2, there is an extensive literature analysing the effect of fiscal manipulations on increasing the incumbent government's chances of being re-elected (see for example, Goodhart and Bhansali, 1970; Kramer, 1971; Nannestad and Paldam, 1994; Lewis-Beck and Paldam, 2000). These manipulations seek to affect the election result through either increases in government spending prior to the election or through tax cuts (Drazen, 2001). The vast majority of this literature has focused on the impact of government expenditure on electoral outcomes and provided mixed evidence. For instance, Brender and Drazen (2008) find that the voters punish the incumbent for loose fiscal policies, while Katsimi and Sarantides (2015) find that election-year manipulation of public investment has no effect on an incumbent's re-election probability but that the level of public investment in the earlier years improves the incumbent's re-election probability. However, the impact of taxation, especially income taxes, on electoral results has received relatively little attention. This is surprising, given that income taxes are an important tool used by an incumbent to influence voters during election campaigns (Finseraas, 2012). As such, the extent to which voters take into account these tax manipulations at election time is an important aspect of the literature that warrants investigation.

The aim of this chapter is to examine the role of income taxes on the vote share of incumbent parties across the EU26 member countries over the period 1996-2016. This is for the thirteen different household groups across the EU member countries. It provides a number of important contributions to the literature, which previously has focused mainly on government expenditure manipulations and in the case of income tax manipulations has focused only on the impact for the electorate as a whole and only for individual countries (Besley and Case, 1995; Geys and Vermeir, 2008; Johnson *et al.*, 2005). Moreover, as mentioned in Chapter 4, the vote share as a dependent variable is advantageous as it captures whether the incumbent government wins or loses votes, compared to the re-election binary variable which cannot capture the votes gained or lost from one election to another and hence cannot capture voting behaviour. As part of the robustness checks, the binary model is also used. In this chapter, the Fixed Effects (FE) and the Quasi-Maximum Likelihood Estimation (QMLE) methods are used to examine whether the changes in the average income tax rates have an effect on the voting share of the incumbent government. The tax measure used is the net Personal Average Tax Rate (PATR), which is available for thirteen different household groups, as discussed in Chapter 4.

Overall, the main findings of this chapter suggest that the incumbent governments, mainly the left-wing party is rewarded as a result of a decrease in the PATRs in the election year. With regard to the left-wing party this indicates its opportunistic behaviour in the run-up to an election whereby it engages in electoral-year decreases in the PATRs and that the voters reward this opportunistic partisan behaviour. The findings are robust if only the pre-determined elections are taken into account. Differentiation between the West EU and CEECs shows that the finding is driven by the CEECs, since, as expected, in the West EU there is some evidence that the vote share of the right-wing party increases as a result of a decrease in the PATRs but there is no evidence that the vote share of the left-wing party is affected as a result of an election-year change in the PATRs, but the contrary result is found for the CEECs.

The chapter is organized as follows. The results from the Fixed Effects estimator are carried out in Section 6.2 and the findings from the QMLE model are presented in Section 6.3. Further extensions to the analysis are discussed in Section 6.4, encompassing the pre-determined elections, the binary model, weighted regressions for different household groups and the analysis for the West EU and CEECs. The marginal effects are presented in Section 6.5, which compares the magnitude of the coefficients from the different estimation techniques used in the chapter. Finally, conclusions are drawn in Section 6.6.

6.2 Preliminary Analysis: Fixed Effects Estimation

In this section the regression results for the Fixed Effects (FE) estimator are presented. This estimates the data as a panel regression across countries and elections, with country-level fixed effects to control for institutional heterogeneity across countries. The estimating Equation (4.3) from Chapter 4 is used to examine the effect of PATR for each of the thirteen household groups (HT1 - HT13) on the vote share of the incumbent party.

The main focus of interest is in examining the effect of PATRs on the vote share of the incumbent government, but by distinguishing between parties of the right and left. Attention is therefore focused on the two dummy variables that capture the distinction between the *Right-wing* and *Left-wing* parties, as well as the interaction terms between these and the different measures of PATR. The main variables of interest are the interaction terms as it is expected that the vote share of the right-wing government increases as a result of a decrease in the PATRs, while the vote share of the left-wing government increases following an increase in the PATRs. Similar to Chapter 5, by adding the interaction terms, the coefficient for the variable *Election* represents the electoral effect for the base group (centre-of party) only. This implies that the interaction terms are significantly different from the centre-of party; these hold true for

the remainder of this chapter. As mentioned in Chapter 5, Luxembourg is chosen as the reference country as it has a centre-of party over the 1996-2016 period since the base group is the centre-of party. As discussed in Chapter 4, it is expected that the right-wing government is rewarded for a PATR cut given the greater emphasis placed on decreasing taxes by the right-wing parties compared to the left-wing parties (Tillman and Park, 2009; Arikan and Bloom, 2015). Conversely, the left-wing government is rewarded for an increase in the PATR given that it concentrates on government spending, so that the voters are likely to accept an increase in tax to fund government spending. Given the findings in Chapter 5 that the left-wing party have a partisan opportunistic behaviour, it may be expected that the left-wing party might also behave opportunistically and cut taxes, and be rewarded for this behaviour. The analysis is conducted for three PATR measures, which capture different effects. These are: average annual PATR over the entire electoral term (*Overall PATR*); the pre-electoral effects that is measured as the average across all years except for the election year (*PreElection PATR*); and the PATR for the election year relative to annual average for the earlier years of the same electoral term (*Election PATR*). The first of these captures whether the government is rewarded or sanctioned for the tax rate over the whole electoral term, the second gives voters time to observe the PATR to form an opinion at election, and the third is for the relative value of the tax rate prior to the election. These are considered in Sections 6.2.1, 6.2.2 and 6.2.3 respectively.

6.2.1 *Overall Effect of PATR on Incumbent Party Vote Share*

In this sub-section, the overall impact of the PATR on the vote share of the incumbent party is analysed using Equation (4.3) from Chapter 4. The empirical findings are presented in Tables 6.1(a) and (b) for single-individual and married-couple households respectively. Overall, there is some evidence that both the right- and left-wing parties are rewarded for lower PATRs, but that this is statistically significant only for the household group HT8.

Before discussing the effect of PATR on vote share, the control variables are examined. The empirical results regarding the macroeconomic variables show that *GDP per capita* and *GDP growth* have the expected positive impact on the vote share. Similar to Chapter 5, the effects are counter-intuitive. Further, while it is expected that inflation has a negative effect on the vote share, the coefficient estimates indicate otherwise, although they are not statistically significant. As expected, the coefficient estimates for the variable *Unemployment* are correctly signed, although insignificant. The interaction of government expenditure with the government ideology shows that the right- and left-wing parties are rewarded for increases in government expenditure, although only statistically significant for the right-wing government. This is not

Table 6.1(a): FE Estimates of PATR on Incumbent Vote Share:

Single-Individual Households

Dependent Variable: log transformation of Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7
Overall PATR: *Right*	-3.337	-3.326	-3.388	-3.882	-3.688	-2.888	-0.769
	(2.696)	(3.467)	(3.914)	(3.959)	(3.333)	(2.544)	(1.507)
Overall PATR: *Left*	-3.345	-3.065	-2.854	-2.818	-2.198	-0.895	-1.541
	(2.717)	(3.400)	(3.814)	(3.761)	(3.176)	(2.464)	(1.564)
Overall PATR	4.526*	3.913	2.861	2.287	1.668	-0.546	1.925
	(2.617)	(3.263)	(3.829)	(3.895)	(3.437)	(2.907)	(1.488)
Right-wing	-1.313	-1.322	-1.310	-1.244	-1.293	-1.419	-1.205
	(1.215)	(1.298)	(1.307)	(1.307)	(1.255)	(1.190)	(1.254)
Left-wing	0.443	0.395	0.354	0.388	0.332	0.150	0.229
	(1.571)	(1.659)	(1.684)	(1.699)	(1.578)	(1.458)	(1.310)
Coalition	-0.111	-0.125	-0.131	-0.132	-0.120	-0.089	-0.079
	(0.186)	(0.179)	(0.177)	(0.177)	(0.175)	(0.175)	(0.187)
Previous vote	0.942	0.966	1.068	1.070	1.032	1.061	0.922
	0.942	0.966	1.068	1.070	1.032	1.061	0.922
Constant	-14.90	-17.87*	-19.31*	-20.52*	-20.46*	-19.23	-21.42*
	(11.19)	(10.81)	(11.29)	(11.89)	(11.92)	(11.86)	(13.00)
Control Variables:							
ln *GDP*	-1.541	-1.929*	-2.130*	-2.294*	-2.301*	-2.224*	-2.373*
	(1.120)	(1.098)	(1.164)	(1.233)	(1.241)	(1.277)	(1.323)
ln *GDP per capita*	2.231	2.648*	2.860*	3.028**	3.034**	2.934*	3.301*
	(1.359)	(1.342)	(1.400)	(1.466)	(1.469)	(1.467)	(1.704)
GDP growth	6.940***	7.059***	7.132***	7.181***	7.379***	7.811***	7.742***
	(2.362)	(2.341)	(2.357)	(2.292)	(2.222)	(2.208)	(2.543)
ln *Inflation* (10^{-2})	4.720	4.98	4.860	4.600	4.210	3.850	5.930
	(6.890)	(7.170)	(7.230)	(7.300)	(7.470)	(7.520)	(8.660)
Unemployment	-1.856	-1.770	-1.605	-1.391	-1.257	-1.038	-0.810
	(2.786)	(2.800)	(2.782)	(2.784)	(2.764)	(2.682)	(2.653)
Govt exp: *Right*	4.815*	5.115*	5.293*	5.623**	5.815**	5.793**	3.214
	(2.690)	(2.701)	(2.695)	(2.717)	(2.751)	(2.753)	(2.922)
Govt exp: *Left*	0.994	1.217	1.329	1.372	1.233	0.875	0.200
	(2.813)	(2.689)	(2.557)	(2.510)	(2.440)	(2.301)	(2.863)
Govt exp	-0.235	-0.501	-0.581	-0.655	-0.743	-0.607	0.891
	(3.379)	(3.281)	(3.208)	(3.198)	(3.184)	(3.159)	(3.749)
Illiteracy	1.083	1.060	0.876	0.749	0.671	0.300	0.302
	(1.745)	(1.852)	(1.945)	(1.972)	(1.937)	(1.970)	(1.855)
No. of observations	132	132	132	132	132	132	132
R-squared	0.301	0.292	0.289	0.290	0.291	0.295	0.301
No. of countries	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.3). *Overall PATR* measures the average for all the years starting with the PATR after the previous election and including the PATR of the current election year. Variables described in Table 6.1. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Table 6.1(b): FE Estimates of PATR on Incumbent Vote Share:

Married-Couple Households

Dependent Variable: log transformation of Vote Share of Incumbent Government

Household Types:	HT8	HT9	HT10	HT11	HT12	HT13
Overall PATR: *Right*	-2.988*	-3.398	-5.117	-5.607	-3.211	-4.470
	(1.716)	(2.663)	(3.197)	(3.555)	(3.764)	(4.117)
Overall PATR: *Left*	-3.411*	-3.830	-5.502	-5.748	-2.580	-3.377
	(1.804)	(2.674)	(3.271)	(3.475)	(3.552)	(3.937)
Overall PATR	3.975*	3.866	5.720*	5.819*	2.402	2.574
	(2.009)	(2.837)	(3.141)	(3.352)	(3.626)	(3.989)
Right-wing	-1.543	-1.523	-1.459	-1.339	-1.401	-1.199
	(1.041)	(1.115)	(1.112)	(1.146)	(1.243)	(1.306)
Left-wing	-0.014	0.010	0.281	0.446	0.280	0.464
	(1.276)	(1.374)	(1.431)	(1.485)	(1.588)	(1.688)
Coalition	-0.105	-0.119	-0.146	-0.141	-0.132	-0.140
	(0.176)	(0.174)	(0.171)	(0.173)	(0.178)	(0.177)
Previous vote	0.900	1.077	0.765	0.707	1.089	1.034
	(0.789)	(0.810)	(0.649)	(0.636)	(0.723)	(0.721)
Constant	-18.34*	-17.41*	-19.32*	-20.42*	-19.21*	-21.16*
	(10.04)	(9.995)	(10.19)	(10.84)	(11.52)	(12.08)
Control Variables:						
ln *GDP*	-2.064**	-1.953*	-2.185**	-2.283**	-2.150*	-2.383*
	(1.000)	(1.007)	(1.006)	(1.065)	(1.220)	(1.257)
ln *GDP per capita*	2.858**	2.673**	2.908**	3.031**	2.860*	3.118**
	(1.317)	(1.296)	(1.329)	(1.402)	(1.423)	(1.492)
GDP growth	7.186***	7.036***	6.777***	6.849***	7.017***	7.061***
	(2.451)	(2.337)	(2.257)	(2.171)	(2.459)	(2.278)
ln *Inflation* (x 10^{-2})	5.960	6.180	5.910	5.080	4.670	4.680
	(8.090)	(7.850)	(7.630)	(7.770)	(7.110)	(7.290)
Unemployment	-1.098	-1.403	-1.750	-1.707	-1.787	-1.425
	(2.814)	(2.684)	(2.436)	(2.490)	(2.615)	(2.714)
Govt exp: *Right*	4.704*	5.089*	5.932**	6.254**	5.341*	5.876**
	(2.456)	(2.603)	(2.590)	(2.689)	(2.800)	(2.744)
Govt exp: *Left*	1.476	1.692	2.283	2.416	1.303	1.541
	(2.668)	(2.639)	(2.670)	(2.615)	(2.523)	(2.480)
Govt exp	-0.402	-0.639	-0.952	-1.044	-0.555	-0.737
	(3.280)	(3.264)	(3.276)	(3.263)	(3.225)	(3.194)
Illiteracy	0.732	0.677	0.686	0.646	0.856	0.754
	(1.707)	(1.776)	(1.789)	(1.818)	(2.006)	(1.948)
No. of observations	132	132	132	132	132	132
R-squared	0.322	0.302	0.317	0.315	0.289	0.293
No. of countries	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.3). *Overall PATR* measures the average for all the years starting with the PATR after the previous election and including the PATR of the current election year. Variables described in Table 6.1. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

as expected, as it is more likely that the voters will reward the left-wing party for increases in government spending. Further, the results show that *Illiteracy* does not influence the voter's choice of penalising or rewarding the incumbent party. Indeed, overall, the findings in Tables 6.1 show that the control variables are not significant for each of the household groups and that the incumbent vote share is mainly influenced by the growth of the economy.

For the main variables of interest, the interaction terms between the PATR and the government ideologies, Table 6.1 shows weak evidence that the overall PATR has an effect on the vote share of either the right- or left-wing government. The findings show that, as compared to the vote share of the centre-of party, the vote share of the right- and left-wing parties increases as a result of an overall decrease in the PATRs, but that it is true only for the household group HT8. The coefficient estimates of the variables capturing the ideological nature of the governments, i.e., whether they are right or left-wing parties, are not statistically significant, and this is also the case for the *Coalition* term. Finally, the variable *Previous vote*, which captures whether there is an incumbency advantage, i.e., if past support effects the current vote share, shows that there are positive coefficient estimates, which is as expected, but they are not statistically significant. Overall, the results in Tables 6.1 are weak, and in fact there is a low R-squared coefficient so that they do not provide a good fit.

6.2.2 *Pre-Electoral Effect of PATR*

The previous sub-section examines the effect on government vote share from PATR during the government's entire term in office. In this section, the focus is on the pre-electoral effect of the PATR on vote share. Therefore, the variable *PreElection PATR* is now used, which measures the average of the PATR starting with the year of the previous election and including the subsequent years over the electoral term except for the current election year. The variable *PreElection PATR* is therefore differs from the *Overall PATR* variable in the previous section. It gives voters adequate time to observe the PATR during the pre-election years and so to form their opinion on whether to reward or punish the incumbent government at the election.

For conciseness, the FE results for only the political and government ideology variables are presented in Table 6.2. The estimates of the control variables are similar to those in Tables 6.1, where the voters reward the incumbent party for an increase in the GDP level. Regarding the interaction terms between the variable *PreElection PATR* and the two different government ideologies, the signs of the coefficient estimates are similar to that in Table 6.1, although they are now insignificant. In particular, there is no evidence that either the vote share of the right- or left-wing parties is affected by the PATR. The coefficient for the variable *Previous vote* is

Table 6.2: FE Estimates of PATR on Incumbent Vote Share: Excluding Electoral Year

Dependent Variable: log transformation of Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
PreElection PATR: *Right*	-3.532	-3.288	-3.282	-3.816	-3.413	-2.556	-0.430	-2.634	-2.760	-4.704	-5.169	-3.430	-4.487
	(2.733)	(3.461)	(3.858)	(3.891)	(3.239)	(2.529)	(1.655)	(1.916)	(2.670)	(3.284)	(3.585)	(3.775)	(4.065)
PreElection PATR: *Left*	-3.373	-2.913	-2.692	-2.726	-1.943	-0.503	-0.770	-2.861	-3.072	-4.978	-5.225	-2.706	-3.347
	(2.687)	(3.304)	(3.682)	(3.588)	(2.984)	(2.386)	(1.644)	(1.754)	(2.539)	(3.236)	(3.417)	(3.464)	(3.793)
PreElection PATR	4.876**	4.049	3.083	2.252	1.575	-0.890	1.419	3.817**	3.560	5.729*	5.608*	2.732	2.681
	(2.359)	(2.901)	(3.508)	(3.551)	(3.040)	(2.711)	(1.606)	(1.853)	(2.514)	(2.962)	(3.137)	(3.337)	(3.758)
Right-wing	-1.315	-1.343	-1.325	-1.235	-1.306	-1.440	-1.358	-1.524	-1.511	-1.446	-1.337	-1.389	-1.182
	(1.215)	(1.283)	(1.295)	(1.291)	(1.242)	(1.186)	(1.298)	(1.074)	(1.137)	(1.122)	(1.155)	(1.227)	(1.289)
Left-wing	0.501	0.406	0.363	0.395	0.314	0.103	0.118	0.0351	0.108	0.294	0.440	0.319	0.482
	(1.564)	(1.649)	(1.683)	(1.696)	(1.577)	(1.474)	(1.322)	(1.286)	(1.385)	(1.438)	(1.486)	(1.588)	(1.681)
Coalition	-0.104	-0.117	-0.126	-0.130	-0.117	-0.0890	-0.0885	-0.0961	-0.109	-0.134	-0.134	-0.133	-0.140
	(0.187)	(0.180)	(0.177)	(0.176)	(0.176)	(0.178)	(0.188)	(0.177)	(0.175)	(0.172)	(0.172)	(0.178)	(0.176)
Previous vote	0.836	0.887	0.988	1.052	1.025	1.083	0.906	0.863	1.040	0.650	0.629	1.011	0.988
	(0.793)	(0.739)	(0.717)	(0.706)	(0.721)	(0.781)	(0.816)	(0.814)	(0.819)	(0.611)	(0.604)	(0.673)	(0.684)
No. of observations	132	132	132	132	132	132	132	132	132	132	132	132	132
R-squared	0.306	0.294	0.289	0.290	0.290	0.294	0.294	0.319	0.298	0.317	0.313	0.290	0.294
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.3). *PreElection PATR* measures the average of the PATR starting with the year of the previous election and including all subsequent years over the electoral term except for the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

positive, but again not statistically significant, so that the incumbent government does not perform better in the current election if it received a higher vote share in the previous election. With respect to the remaining partisan variables, *Right-wing*, *Left-wing* and *Coalition*, there is no significant evidence that they have an effect on the vote share of the government.

6.2.3 *Electoral Effect of PATR*

In this sub-section, the electoral effect of PATR on the vote share of the incumbent governments is examined. This is the third measurement of PATR, which is given by the variable *Election PATR*. It is measured as the change between the PATR in the election year and the average of the PATR starting with the previous election year but excluding the current election year. The variable *Election PATR* captures the electoral effect of PATR on the vote share of the incumbent government. The findings, using the FE estimator, are presented in Table 6.3, which is for all household groups. The coefficient estimates for the control variables are not shown, but again these are similar to the previous results.

Regarding the interaction terms between the government ideologies and *Election PATR*, there is no evidence in favour of the right-wing parties being penalised or rewarded as a result of electoral changes in the PATR, as compared to the centre-of party. The findings in Table 6.3 however now show that the left-wing parties are rewarded following a cut in the PATRs for a number of the household groups, comprising households with single individuals with no children (HT3 and HT6) or two children (HT7) and married couples with two children (HT8 to HT11), as compared to the centre-of party. Again, there is no significant evidence that the partisan variables, *Left-wing* and *Coalition*, have an effect on the vote share of the government, although the coefficient estimates on the *Right-wing* now show that it has a negative and significant effect of the vote share of the incumbent, although a positive effect is expected. In addition, unlike the previous results, *Previous vote* now shows there is a positive and statistically significant effect for the household groups HT3 and HT7.

Table 6.3: FE Estimates of PATR on Incumbent Vote Share: Change in PATR

Dependent Variable: log transformation of Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	7.101	4.171	2.000	1.421	-3.646	-9.738	-1.886	-1.634	-5.245	-2.199	-4.068	8.412	3.984
	(9.883)	(9.216)	(8.052)	(8.159)	(7.228)	(9.036)	(2.124)	(8.997)	(6.857)	(8.209)	(8.455)	(9.043)	(8.031)
Election PATR: Left	-5.996	-14.42	-17.29*	-13.17	-17.98	-24.60*	-7.538***	-13.26***	-18.00***	-17.07**	-11.93**	-6.388	-10.16
	(8.460)	(9.307)	(9.316)	(11.32)	(11.82)	(12.33)	(1.465)	(3.749)	(5.753)	(6.680)	(5.235)	(9.070)	(10.40)
Election PATR	-2.931	2.120	2.197	6.457	8.922	15.12*	2.539**	5.787	6.151	2.671	7.033	-0.669	3.315
	(5.162)	(6.948)	(6.979)	(7.299)	(6.971)	(8.232)	(1.000)	(3.514)	(3.839)	(2.902)	(4.740)	(4.907)	(6.490)
Right-wing	-1.603	-1.470	-1.624	-1.676	-1.792	-2.015	-1.286	-1.815*	-1.829*	-1.591	-1.804	-1.584	-1.627
	(1.137)	(1.080)	(1.145)	(1.178)	(1.231)	(1.263)	(1.033)	(1.025)	(1.050)	(1.141)	(1.121)	(1.080)	(1.143)
Left-wing	0.185	0.093	0.218	-0.127	-0.135	-0.386	0.209	-0.0520	0.206	0.428	-0.042	-0.014	-0.029
	(1.301)	(1.318)	(1.411)	(1.442)	(1.439)	(1.477)	(1.252)	(1.335)	(1.203)	(1.267)	(1.171)	(1.330)	(1.395)
Coalition	-0.070	-0.051	-0.046	-0.075	-0.090	-0.115	-0.077	-0.088	-0.083	-0.054	-0.074	-0.068	-0.071
	(0.189)	(0.184)	(0.180)	(0.186)	(0.188)	(0.190)	(0.188)	(0.180)	(0.184)	(0.182)	(0.207)	(0.184)	(0.183)
Previous vote	1.029	1.303	1.350*	1.161	1.276	1.268	1.773*	1.364	1.275	1.298	1.215	0.954	1.153
	(0.929)	(0.786)	(0.748)	(0.811)	(0.772)	(0.766)	(1.015)	(0.928)	(0.975)	(0.964)	(0.989)	(0.880)	(0.810)
No. of observations	132	132	132	132	132	132	132	132	132	132	132	132	132
R-squared	0.309	0.323	0.329	0.306	0.313	0.339	0.365	0.371	0.355	0.340	0.312	0.305	0.302
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.3). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

The findings for the electoral effect of PATR in Table 6.3 can be compared with the effects of PATR prior to the election year in Table 6.2 as well as the overall effect of PATR in Table 6.1. In summary, there is weak or no evidence that the PATRs has an effect on the vote share of the right-wing governments. In Chapter 5, it has been found that the left-wing party has an opportunistic behaviour in that it engages in electoral cuts in the PATRs. In this section, it can be seen that the electoral cuts in the PATRs can lead to an increase in the vote share of the left-wing party, but that the timing of this is important, and it supports the earlier finding that the left-wing governments seek to manipulate the tax rates for certain household groups. In the following section, the Fractional Probit estimator is used to compare the above effects, with the focus on the electoral manipulations of the incumbent government.

6.3 Fractional Probit Estimation

So far, the FE estimator has been used to estimate Equation (4.3) to examine the effect of the PATR on the vote share of the incumbent government, where a log transformation of the dependent variable of the vote share in Equation (4.2) is performed to overcome the issues related to the dependent variable being bounded between 0 and 1. As proposed by Papke and Wooldridge (2008), however, the Fractional Probit model can be used to directly estimate Equation (4.2) by taking into account the non-linearity of the dependent variable. As shown in Chapter 4, the Fractional Probit estimator is implemented through Bernoulli quasi-maximum likelihood estimation (QMLE), which is achieved by maximising a log-likelihood function to yield consistent estimates. Consequently, the QMLE is used to estimate Equation (4.2) from Chapter 4, where the focus is on the variable *Election PATR* to analyse the effect of electoral manipulations of PATRs on the vote share of the incumbent government.

Overall, the findings using the QMLE estimator in Tables 6.4(a) and 6.4(b) are similar to Table 6.4 in terms of the sign of the coefficient estimates for the interaction terms on the *Election PATR* variables. There is again no evidence in favour of the right-wing government being rewarded or punished for electoral changes in the PATRs. However, there is strong evidence of a positive effect of the electoral cut in the PATRs on the vote share of the left-wing government, which is for household groups consisting of single individuals (HT2, HT3 and HT5 to HT7) and married couples (HT8 to HT10). There is also evidence that the centre-of party is rewarded for an increase in the PATRs for the household groups HT6 and HT7. The negative coefficients of the variables *Election PATR: Left* suggest that the voters reward the opportunistic behaviour of the left-wing party, which is like Section 6.2.3. It may seem counter-

Table 6.4(a): QMLE Estimates of PATR on Incumbent Vote Share: Single-Individual Households

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7
Election PATR: Right	2.816	1.759	0.253	-0.998	-3.917	-6.235	-0.784
	(3.854)	(4.066)	(3.846)	(4.342)	(4.353)	(4.517)	(1.135)
Election PATR: Left	-2.478	-6.861*	-8.565**	-7.317	-10.01**	-12.32**	-3.582***
	(3.357)	(4.013)	(4.041)	(4.741)	(4.843)	(4.848)	(0.871)
Election PATR	-1.483	1.085	1.399	4.393	5.909	8.386**	1.114*
	(2.332)	(3.229)	(3.406)	(4.069)	(4.153)	(3.887)	(0.657)
Right-wing	-0.640	-0.589	-0.671	-0.713	-0.789	-0.931*	-0.509
	(0.451)	(0.440)	(0.461)	(0.474)	(0.496)	(0.500)	(0.427)
Left-wing	0.219	0.162	0.222	0.0309	-0.002	-0.156	0.235
	(0.536)	(0.540)	(0.571)	(0.570)	(0.582)	(0.594)	(0.480)
Coalition	-0.060	-0.048	-0.046	-0.059	-0.065	-0.076	-0.058
	(0.084)	(0.084)	(0.084)	(0.086)	(0.087)	(0.087)	(0.083)
Previous vote	0.439	0.549	0.582	0.495	0.543	0.512	0.745
	(0.491)	(0.434)	(0.429)	(0.459)	(0.451)	(0.460)	(0.473)
Constant	-12.18***	-12.58**	-13.10**	-14.05***	-0.702	-16.12***	-12.15***
	(4.654)	(4.919)	(5.094)	(5.377)	(0.688)	(5.464)	(4.586)
Control Variables:							
ln GDP	-1.394**	-1.464**	-1.532**	-1.645**	-1.767**	-1.929***	-1.333**
	(0.570)	(0.613)	(0.643)	(0.677)	(0.688)	(0.694)	(0.554)
ln GDP per capita	1.786***	1.847***	1.901**	2.086***	2.218***	2.430***	1.831***
	(0.669)	(0.715)	(0.750)	(0.795)	(0.809)	(0.815)	(0.660)
GDP growth	3.601**	3.444**	3.384**	3.721***	3.836***	3.919***	3.906***
	(1.432)	(1.400)	(1.414)	(1.381)	(1.376)	(1.363)	(1.498)
ln Inflation (x 10^{-2})	2.400	2.800	2.470	3.300	3.530	3.920	3.340
	(3.740)	3.900)	(3.930)	(4.010)	(3.860)	(3.790)	(3.490)
Unemployment	-0.990	-0.974	-0.900	-1.196	-1.306	-1.434	-0.942
	(1.014)	(0.999)	(1.000)	(0.990)	(0.987)	(0.979)	(0.987)
Govt exp: *Right*	1.705	1.568	1.752	1.873*	2.059*	2.397**	1.402
	(1.057)	(1.040)	(1.086)	(1.110)	(1.161)	(1.166)	(0.976)
Govt exp: *Left*	-0.195	-0.0814	-0.186	0.226	0.302	0.654	-0.249
	(1.195)	(1.205)	(1.271)	(1.271)	(1.301)	(1.323)	(1.054)
Govt exp	0.238	-0.069	-0.082	-0.131	-0.205	-0.569	0.503
	(1.345)	(1.374)	(1.432)	(1.434)	(1.454)	(1.416)	(1.279)
Illiteracy	0.383	0.143	0.271	0.386	0.267	0.321	0.510
	(0.851)	(0.849)	(0.770)	(0.790)	(0.791)	(0.795)	(0.741)
No. of observations	132	132	132	132	132	132	132
Log-Pseudolikelihood	-51.69	-51.66	-51.65	-51.69	-51.67	-51.62	-51.58
No. of countries	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Table 6.4(b): QMLE Estimates of PATR on Incumbent Vote Share: Married-Couple Households

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	-1.110	-2.484	-1.048	-1.375	3.851	1.123
	(2.969)	(2.799)	(3.434)	(3.370)	(3.981)	(4.129)
Election PATR: Left	-6.227***	-8.303***	-7.955***	-4.856	-2.335	-5.041
	(2.303)	(2.952)	(2.998)	(3.317)	(3.780)	(4.511)
Election PATR	2.675	2.694	0.807	2.623	-0.543	2.064
	(2.119)	(2.423)	(2.224)	(2.569)	(2.747)	(3.709)
Right-wing	-0.770*	-0.765*	-0.634	-0.744	-0.633	-0.667
	(0.465)	(0.462)	(0.468)	(0.459)	(0.441)	(0.460)
Left-wing	0.103	0.228	0.363	0.119	0.122	0.100
	(0.514)	(0.517)	(0.531)	(0.502)	(0.538)	(0.553)
Coalition	-0.063	-0.061	-0.049	-0.060	-0.058	-0.058
	(0.079)	(0.082)	(0.082)	(0.085)	(0.083)	(0.084)
Previous vote	0.578	0.524	0.533	0.463	0.382	0.489
	(0.466)	(0.470)	(0.465)	(0.500)	(0.478)	(0.456)
Constant	-13.32***	-13.31***	-12.50**	-13.03***	-11.97**	-13.08**
	(5.022)	(5.148)	(5.042)	(4.907)	(4.767)	(5.122)
Control Variables:						
ln GDP	-1.531**	-1.539**	-1.430**	-1.521**	-1.371**	-1.515**
	(0.622)	(0.636)	(0.620)	(0.609)	(0.591)	(0.640)
ln GDP per capita	1.992***	1.962***	1.824**	1.988***	1.780**	1.939***
	(0.736)	(0.750)	(0.733)	(0.712)	(0.692)	(0.750)
GDP growth	3.698**	3.673**	3.527**	3.575**	3.584**	3.662***
	(1.436)	(1.479)	(1.486)	(1.479)	(1.404)	(1.390)
ln Inflation (x 10^{-2})	2.120	1.750	1.920	2.180	2.390	2.880
	(3.790)	(3.780)	(3.740)	(3.940)	(3.960)	(3.960)
Unemployment	-1.064	-0.966	-0.844	-0.720	-1.102	-1.076
	(0.998)	(0.995)	(1.077)	(1.067)	(1.000)	(1.031)
Govt exp: *Right*	2.004*	1.980*	1.659	1.945*	1.680	1.761
	(1.082)	(1.074)	(1.079)	(1.067)	(1.033)	(1.076)
Govt exp: *Left*	0.0898	-0.184	-0.496	0.0388	0.0184	0.0719
	(1.147)	(1.153)	(1.176)	(1.133)	(1.204)	(1.234)
Govt exp	-0.116	-0.0741	0.167	-0.567	0.104	-0.027
	(1.285)	(1.281)	(1.338)	(1.333)	(1.394)	(1.414)
Illiteracy	0.698	0.546	0.433	0.381	0.535	0.478
	(0.743)	(0.744)	(0.747)	(0.802)	(0.808)	(0.802)
No. of observations	132	132	132	132	132	132
Log-Pseudolikelihood	-51.57	-51.60	-51.62	-51.69	-51.70	-51.70
No. of countries	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

intuitive that voters will reward a party of a particular ideology for pursuing a policy different to its own ideology, but Cukierman and Tommasi (1998), Cowen and Sutter (1998) and Tavares (2004) find that it is acceptable for the incumbent parties to do this as long as the policies benefit the voters.

With regard to the ideology variables, *Right-wing* and *Left-wing*, there is some limited evidence that a right-wing party has a negative and significant effect on the vote share of the incumbent government that may just indicate that it receives less support from the voters compared to the other government ideologies. Further, the coefficient estimates of *Previous vote* are positive, but not statistically significant. The findings for the QMLE model in Tables 6.4(a) and 6.4(b) also reveal that there is evidence that the vote share of the incumbent government is positively affected by the following variables: *GDP per capita*, *GDP growth* and *Govt exp: Right*. There is, however, no evidence that *Inflation*, *Unemployment* or *Illiteracy* have a significant effect on the vote share of the incumbent government. In line with the earlier FE estimates and with the existing literature this suggests that voters reward the incumbent for economic growth.

Although the main focus of this section is on the Fractional Probit estimations for the *Election PATR*, for comparison, the Fractional Probit results using the variables *Overall PATR* and *PreElection PATR* are given in Appendix Tables 6.1 and 6.2. From these, it can be seen that there is evidence that the right- and left-wing parties are rewarded following a decrease in the PATRs that has occurred over the entire time in office (*Overall PATR*) and for a decrease in this prior to the election year (*PreElection PATR*). These are different to the results of the fixed effects estimator in Tables 6.1 and 6.2, where there is evidence for the left-wing government being rewarded for PATRs reduction both across the duration in government and regarding the electoral manipulations, and that, for the right-wing government, while it is not rewarded for electoral manipulations in the PATRs, it is rewarded for lower PATRs during its term in office. Since the aim of the thesis is to pick-up the electoral manipulations, in the remaining of this chapter the focus is on the variable *Election PATR*.

6.4 Robustness

The following sections carry out sensitivity analysis of the QMLE results. Firstly, the timing of the elections is examined, whereby elections can fall at different times of a calendar year and can also either take place at the constitutionally fixed time, i.e., pre-determined, or outside of these fixed times. Secondly, the electoral effect of the PATR on the re-election probability is considered so that these can be compared to the majority of the studies that use a binary model.

Thirdly, since the thirteen household groups are not a true representation of the size of these groups in each country, the PATR of the thirteen different household groups are weighted according to their size. Finally, given the dataset consists of the EU26 countries, it is possible to differentiate between the older and less-established democracies of the EU to test whether the findings are consistent across these two groups of countries.

6.4.1 *The Election Timing*

In this section, two robustness tests are carried out with regard to the timing of elections. First, there is an issue about the specific date of an election. So far, the electoral terms have been measured according to the calendar year of the election, which is irrespective of whether the election occurs at the beginning or end of a calendar year. As mentioned earlier, the variable *Election PATR* is measured as the change between the PATR in the election year and the average of the PATR over the previous years, but including the current election year. A potential drawback with this measure however is that if an election takes place early in the year, for example in January, then the position of the economy during that year cannot reflect pre-election manipulation by the government, but the converse is the case if the election is later in the year. To consider the effect of this, a new election variable is specified, *Election monthly*, which alters the *Election PATR* variable by altering the definition of the election period. If an election takes place in the first six months of the year, the election year is defined as the year before the election, and if an election takes place in the second half of the year, the election year is defined as the election year itself. The results for the *Election monthly* variable are shown in Table 6.5, which can be compared with Table 6.4.[2] Similar to the previous findings, there is no evidence that the vote share of the right-wing party is affected, while the left-wing party is rewarded for cuts in the PATRs. It suggests that the timing of the election in the calendar year does not impact on the underlying results.

[2] It should be noted that the number of observations further decreases from 132 to 131. This is because with the new specification there is one observation where the inflation rate is negative, and the log transformation is used.

Table 6.5: QMLE Estimates of PATR on Incumbent Vote Share: *Election monthly*

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election monthly:	1.684	0.659	-0.265	-1.038	-3.542	-5.470	-0.361	-2.534	-3.448	-1.718	-1.275	2.674	0.787
Right	(3.448)	(3.698)	(3.332)	(3.705)	(3.681)	(3.802)	(1.093)	(2.637)	(2.450)	(3.210)	(3.188)	(3.723)	(3.844)
Election monthly: Left	-2.249	-6.527**	-8.367***	-5.963	-8.198**	-9.390**	-3.506***	-6.593***	-7.989***	-7.028***	-3.952	-2.049	-4.078
	(2.910)	(3.317)	(3.228)	(3.751)	(3.862)	(4.100)	(0.814)	(2.018)	(2.583)	(2.663)	(2.827)	(3.327)	(3.893)
Election monthly	-1.108	1.365	1.494	3.973	5.021	6.858**	1.040*	3.055*	2.949	1.016	1.998	-0.245	2.027
	(2.238)	(2.709)	(2.594)	(3.056)	(3.218)	(3.218)	(0.629)	(1.842)	(1.968)	(1.963)	(2.342)	(2.585)	(3.213)
Right-wing	-0.530	-0.472	-0.539	-0.572	-0.631	-0.720	-0.415	-0.672	-0.652	-0.491	-0.572	-0.508	-0.531
	(0.517)	(0.508)	(0.517)	(0.533)	(0.546)	(0.539)	(0.483)	(0.521)	(0.519)	(0.526)	(0.531)	(0.509)	(0.524)
Left-wing	0.392	0.333	0.397	0.252	0.228	0.109	0.429	0.317	0.403	0.511	0.361	0.306	0.300
	(0.614)	(0.604)	(0.613)	(0.623)	(0.631)	(0.639)	(0.554)	(0.569)	(0.584)	(0.595)	(0.596)	(0.615)	(0.618)
Coalition	-0.083	-0.069	-0.059	-0.080	-0.086	-0.100	-0.079	-0.081	-0.081	-0.066	-0.083	-0.078	-0.076
	(0.080)	(0.080)	(0.080)	(0.081)	(0.082)	(0.081)	(0.080)	(0.075)	(0.077)	(0.078)	(0.079)	(0.079)	(0.080)
Previous vote	0.395	0.464	0.501	0.365	0.410	0.377	0.610	0.453	0.418	0.437	0.367	0.314	0.384
	(0.478)	(0.430)	(0.424)	(0.463)	(0.449)	(0.456)	(0.442)	(0.447)	(0.460)	(0.454)	(0.481)	(0.474)	(0.457)
No. of observations	131	131	131	131	131	131	131	131	131	131	131	131	131
Log pseudolikelihood	-51.39	-51.35	-51.34	-51.38	-51.37	-51.34	-51.25	-51.24	-51.29	-51.32	-51.39	-51.40	-51.39
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election monthly* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Table 6.6: QMLE Estimates of PATR on Incumbent Vote Share: Pre-Determined Elections

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR:	5.056	3.383	0.924	-4.316	-6.471	-5.291	0.705	4.742	4.421	6.200	3.693	3.871	-1.740
Right	(3.888)	(4.449)	(4.560)	(4.730)	(4.411)	(4.394)	(1.357)	(3.325)	(3.760)	(4.269)	(3.203)	(4.097)	(4.262)
Election PATR: Left	-5.005	-9.596**	-11.85**	-12.44**	-13.63***	-13.03***	-2.694***	-3.638	-6.129*	-7.020**	-1.820	-5.456	-9.143**
	(3.385)	(4.462)	(4.817)	(4.856)	(4.426)	(4.158)	(0.997)	(2.661)	(3.336)	(2.987)	(3.150)	(3.489)	(4.164)
Election PATR	-1.260	2.292	4.308	8.556*	8.743**	7.949**	0.646	0.497	0.237	0.0791	-0.449	0.212	5.006
	(2.861)	(4.160)	(4.624)	(4.558)	(3.939)	(3.417)	(0.853)	(2.535)	(3.215)	(2.476)	(2.518)	(3.024)	(3.709)
Right-wing	-0.487	-0.405	-0.524	-0.667	-0.712	-0.731	-0.311	-0.407	-0.399	-0.417	-0.397	-0.428	-0.526
	(0.466)	(0.445)	(0.487)	(0.484)	(0.478)	(0.469)	(0.469)	(0.543)	(0.515)	(0.502)	(0.465)	(0.460)	(0.466)
Left-wing	0.300	0.203	0.168	-0.0258	0.0330	0.0216	0.346	0.305	0.372	0.339	0.373	0.259	0.181
	(0.572)	(0.553)	(0.602)	(0.576)	(0.563)	(0.560)	(0.574)	(0.598)	(0.586)	(0.582)	(0.530)	(0.540)	(0.536)
Coalition	-	-0.139	-0.155*	-0.187**	-0.190**	-0.190**	-0.154*	-	-0.152*	-0.127	-	-	-0.164*
	0.159*							0.160*			0.178*	0.165*	
	(0.094)	(0.094)	(0.093)	(0.090)	(0.089)	(0.087)	(0.088)	(0.088)	(0.089)	(0.094)	(0.093)	(0.090)	(0.088)
Previous vote	0.006	0.176	0.214	0.128	0.188	0.158	0.399	0.124	0.037	0.023	0.010	0.024	0.206
	(0.463)	(0.403)	(0.410)	(0.447)	(0.441)	(0.449)	(0.448)	(0.429)	(0.432)	(0.441)	(0.492)	(0.467)	(0.455)
No. of observations	100	100	100	100	100	100	100	100	100	100	100	100	100
Log pseudolikelihood	-39.30	-39.28	-39.29	-39.33	-39.31	-39.31	-39.31	-39.29	-39.28	-39.28	-39.37	-39.34	-39.35
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

The second issue relating to the timing of the election, as discussed in Chapter 3, is that elections are not always pre-determined, so they do not always take place at the constitutionally fixed term. This might arise due to unforeseen events, such as economic conditions, coalition collapse or other such stochastic events. If elections are pre-determined, the incumbent parties have sufficient time to implement their fiscal policies to increase their re-election chances, which may not be the case for the elections are not pre-determined (Brender and Drazen, 2005; Shi and Svensson, 2006). Indeed, in Chapter 5, there is evidence of electoral cuts in the PATR when the election dates are pre-determined for the left-wing party. Table 6.6 presents the results for the pre-determined elections using the *Election monthly* variable. The results are similar to Tables 6.4 in that the left-wing parties are again rewarded for electoral cuts in the PATRs. If anything, the effects are stronger since a cut in the PATRs leads to an increase in the vote share for all household groups, but with the exception of HT7 to HT11. Like Table 6.4 there is no evidence that the right-wing party is rewarded for a decrease in the PATRs. Overall, the findings of the pre-determined elections confirm the main results of Table 6.4.

6.4.2 *Re-Election Probability*

As seen in Chapter 2, most of the studies on electoral accountability tend to examine the effects of fiscal policy on the re-election prospects using binary models. In order to compare the findings of this chapter to the existing literature, the effect of electoral policy on the probability of re-election is examined in this section. To carry out this analysis, the dependent variable is now changed from the vote share of the incumbent government to the re-election probability. Using data from the *IPU*, the dependent variable *Re-election* is set to the value of 1 if the same party is re-elected and 0 otherwise. Since the net PATR may differ across countries, country fixed effects are taken into account. As such, the logit model is implemented to take into account the non-linear dependent variable. The findings using the binary model are shown in Table 6.7, where the coefficients are the logit coefficients as it is not possible to estimate the marginal effects when the country fixed effects are included (Chamberlain, 1980). It should be noted that on using the logit model, the number of observations decreases from 132 to 103; 29 observations are dropped as the binary dependent variable shows no variation for Italy, Latvia, Lithuania, Luxembourg, Romania and Sweden as the dependent variable is always 0 or 1. According to Norton (2012), observations with no within-country variation in the dependent variable are dropped from the model.

From Table 6.7, it can be seen that electoral changes in the PATR have a negative effect on the re-election probability for both the right- and left-wing parties, as compared to the centre-

Table 6.7: Effect of PATR on Re-Election Probability

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	-75.96	-21.54	-18.85	-22.21	-21.98	-25.84	-37.81	-92.29	-120.9**	-12.49	-24.57	-52.74	-26.18
	(48.80)	(61.64)	(64.15)	(69.93)	(61.27)	(54.68)	(24.47)	(58.74)	(60.80)	(43.29)	(39.16)	(59.23)	(63.01)
Election PATR: Left	26.45	46.45	42.30	63.47	27.22	11.25	-43.60**	-113.8**	-124.8**	-28.54	-62.86*	61.14	64.74
	(42.39)	(57.56)	(60.38)	(64.18)	(60.24)	(52.16)	(22.24)	(52.81)	(55.85)	(37.16)	(38.07)	(48.24)	(58.70)
Election PATR	8.725	-28.72	-47.10	-24.51	-5.754	4.532	27.52	101.2*	122.2**	11.35	43.56	-9.748	-22.95
	(29.13)	(49.55)	(50.94)	(57.84)	(51.66)	(42.65)	(17.58)	(52.03)	(54.34)	(29.75)	(31.48)	(38.85)	(50.96)
Right-wing	3.109	2.276	2.472	2.972	2.843	2.603	1.102	-8.683	-8.193	2.110	0.697	3.024	2.928
	(5.448)	(5.385)	(5.489)	(5.408)	(5.397)	(5.447)	(5.780)	(8.710)	(7.890)	(5.434)	(5.636)	(5.477)	(5.412)
Left-wing	4.917	5.601	6.061	4.512	4.557	4.401	4.360	-3.745	-3.466	5.237	4.484	4.489	4.425
	(6.575)	(6.509)	(6.542)	(6.563)	(6.590)	(6.695)	(6.840)	(9.331)	(8.410)	(6.582)	(6.695)	(6.666)	(6.567)
Coalition	-0.477	-0.351	-0.323	-0.403	-0.326	-0.310	-0.235	-0.445	-0.203	-0.293	-0.231	-0.433	-0.429
	(0.914)	(0.880)	(0.877)	(0.880)	(0.873)	(0.876)	(0.955)	(1.037)	(0.992)	(0.901)	(0.936)	(0.895)	(0.883)
Previous vote	2.187	-0.0944	-0.334	0.268	-0.0203	-0.165	3.942	1.573	1.719	0.196	-1.111	0.760	-0.0551
	(5.650)	(5.206)	(5.191)	(5.278)	(5.169)	(5.187)	(5.731)	(5.527)	(5.528)	(5.542)	(5.750)	(5.513)	(5.387)
No. of observations	103	103	103	103	103	103	103	103	103	103	103	103	103
Log pseudolikelihood	-36.96	-38.22	-37.58	-37.83	-38.94	-39.23	-36.11	-34.71	-35.84	-39.24	-38.01	-36.79	-37.62
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

of party. These hold true for the household group HT 9 for the right-wing party, and the household groups HT7 to HT9 and HT11 for the left-wing party. These findings indicate that the electoral decrease in the net PATR lead to an increase in the re-election chances for both the right- and left-wing parties. As compared to the main findings in Tables 6.4(a) and 6.4(b), it can be said that, although the re-election probability of the right-wing party increases following an electoral decrease in the PATRs, there is no significant evidence that the vote share of the right-wing is affected by an electoral change in the PATRs. Moreover, on comparing the significance level on the variables *Election: Left* from Tables 6.4 and 6.7, it can be said that although the vote share increases, this does not necessarily imply that the party is re-elected. As such, the binary model of re-election probability does not take into account that although a party experiences an increase in vote share, it may still not be re-elected. For this reason, the vote share is preferred to the re-election probability as the dependent variable. The vote share allows to capture the voting behaviour in terms of the percentage of votes won or lost by the incumbent government.

6.4.3 *Weighted PATRs*

The number of voters in each of the household types may vary across the EU-member countries, so that this could potentially affect the impact on the aggregate vote share. For example, if lower taxes affect particular household groups then this is expected to affect voter behaviour more in those countries that have a relatively greater number of these voters. This means that the estimates so far, which give an equal weight to each household type, are potentially biased. To address this issue, the thirteen household groups are weighted for each country relative to the EU26 average. This is the same as the weighting adopted in Section 5.4 in Chapter 5, so that the data for the number of single individuals and married couples are only available from 1996, and in the case of Denmark and Sweden are only available from 2010. For the period 2010-16, the sample size is therefore reduced from 132 observations to just 44 observations. To overcome this small number of observations, the weighted PATR are carried out for the 1996-2016 period, excluding Denmark and Sweden, which leads to a total of 64 observations, although the number of observations further decreases to 61 owing to the log transformation of *Inflation*. The QMLE results for the electoral effect of the weighted PATRs for the *Election PATR* variables are presented in Table 6.8, which can be compared to Table 6.4.

The weighted PATR gives different results to Table 6.4. There is now evidence that the vote share of the right-wing party increases as a result of an election-year cut in the PATRs for the household groups consisting of single individuals with no children (HT1 to HT5). This is in contrast to Table 6.4, where there is no evidence that there is any electoral effect of PATR

on the vote share of the right-wing party. However, similar to Table 6.4, the findings indicate that the left-wing party is rewarded for an election-year cut in the weighted PATR. There is now a positive effect of the variable *Left-wing* on the vote share of the incumbent government, suggesting that the left-wing parties get the support of the voters of the similar ideology. Care should be taken when making this comparison as Table 6.8 is a restricted sample with regard to both the time period and included countries. For comparison with Table 6.8, Appendix Table 6.3 gives the results for the non-weighted estimates for the restricted sample, and it also shows that the right-wing party is rewarded for a decrease in the PATRs, while the left-wing party is rewarded for an increase in the PATRs. Finally, Appendix Table 6.4 gives the results of the unweighted PATR over the 1996-2016 period but excluding the observations for Denmark and Sweden, and these findings are similar to Table 6.4, suggesting that the exclusion of these two countries in Table 6.9 does not explain the above results. Overall, the results indicate that the left-wing party is rewarded for election-year cut in the PATRs.

Table 6.8: QMLE Estimates of PATR on Incumbent Vote Share: Weighted Results

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	-1.376*	-1.400*	-1.269*	-1.209*	-1.324**	-0.799	0.0921	-1.318	-1.010	-0.771	-0.639	-0.133	-0.244
	(0.737)	(0.718)	(0.713)	(0.694)	(0.657)	(0.770)	(0.591)	(0.841)	(0.825)	(0.731)	(0.691)	(0.822)	(0.759)
Election PATR: Left	-1.483*	-1.497*	-1.405*	-1.338*	-1.587**	-1.178	0.846	-1.982**	-1.667*	-1.367*	-1.151	-0.393	-0.511
	(0.851)	(0.795)	(0.778)	(0.746)	(0.717)	(0.805)	(1.287)	(0.993)	(0.881)	(0.753)	(0.700)	(0.890)	(0.806)
Election PATR	2.371**	2.193**	1.827**	1.629*	1.505*	0.450	0.959	1.436	1.017	0.647	0.622	0.029	0.035
	(0.946)	(0.882)	(0.888)	(0.875)	(0.882)	(1.130)	(0.669)	(0.987)	(0.982)	(0.810)	(0.732)	(0.808)	(0.729)
Right-wing	-0.360	-0.485	-0.499	-0.509	-0.510	-0.328	-0.609	-0.479	-0.453	-0.375	-0.373	-0.247	-0.245
	(0.614)	(0.601)	(0.602)	(0.607)	(0.605)	(0.620)	(0.710)	(0.721)	(0.717)	(0.702)	(0.704)	(0.714)	(0.717)
Left-wing	2.105*	1.997*	1.911*	1.978*	1.892*	1.434	2.005**	1.259	1.038	1.040	1.018	1.319	1.390
	(1.097)	(1.103)	(1.114)	(1.136)	(1.134)	(1.214)	(0.960)	(1.095)	(1.139)	(1.141)	(1.136)	(1.149)	(1.199)
Coalition	-0.00§	-0.008	0.004	0.015	0.042	0.021	-0.248*	0.044	0.004	0.006	-0.010	-0.017	0.002
	(0.115)	(0.114)	(0.118)	(0.122)	(0.132)	(0.146)	(0.136)	(0.157)	(0.145)	(0.139)	(0.139)	(0.138)	(0.140)
Previous vote	0.538	0.510	0.481	0.447	0.420	0.389	0.745	0.746	0.524	0.430	0.416	0.371	0.345
	(0.522)	(0.518)	(0.524)	(0.528)	(0.524)	(0.543)	(0.594)	(0.563)	(0.551)	(0.552)	(0.556)	(0.561)	(0.558)
No. of observations	61	61	61	61	61	61	61	61	61	61	61	61	61
Log pseudolikelihood	-23.34	-23.34	-23.35	-23.35	-23.34	-23.36	-23.35	-23.35	-23.35	-23.35	-23.35	-23.37	-23.37
No. of countries	24	24	24	24	24	24	24	24	24	24	24	24	24
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

6.4.3 *Established (West EU) and New Democracies (CEECs)*

The lack of democratic history and unstable party systems of the Central and Eastern European Countries (CEECs) distinguishes these young democracies from the more-established electoral systems of the older EU member states (Jung, 2018). It is therefore important to compare voting behaviour between these, where the latter are the EU16 countries that include the western EU member countries and those to the south, such as Greece, which together are referred to as the West EU. In this section, whether or not the effect of changes in the PATRs on the incumbent vote share differs between the established and newer democracies is investigated. The results for the PATR, government ideologies and political variables for the West EU and CEECs are reported in Tables 6.9 and 6.10, where the number of observations in each case are 79 and 53 respectively. The variable *Election PATR*, measuring the change between the PATR in the election year and the average of PATR starting with the last election year and excluding the current election year, is used for comparison with the earlier results in the chapter (i.e., the non-weighted estimates). Overall, the QMLE findings in Tables 6.9 and 6.10 indicate that, as compared to the centre-of party, voters in the West EU reward the right-wing government for decreases in the PATRs, but that voters in the CEECs reward the left-wing government for decreases in the PATRs. These results indicate that the previous findings for the left-wing government are driven by the CEECs.

The results for the established democracies in Table 6.9 indicate that the right-wing governments are rewarded for cuts in the PATR for the household groups of single individuals with no children (HT1 and HT3) and married couples with either two (HT8 to HT11) or no children (HT12), as compared to that of the centre-of party. It is different to the main findings for the EU26 in Table 6.5, where there is no effect for the right-wing party. There is, however, no significant evidence that the vote share of the left-wing government is affected as a result of a change in the PATRs in the West EU. A possible explanation is that the voters may recognise that the election-year decrease in the PATRs by the left-wing party is a form of electoral manipulation since the left-wing usually depends on tax revenue to finance its government spending. As such, the results in Table 6.9 support the hypothesis for the West EU that the right-wing government is rewarded for PATR cuts.

Table 6.9: QMLE Estimates of PATR on Incumbent Vote Share: West EU

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	-14.50***	-5.236	-6.292*	-4.098	-5.903	-4.134	0.719	-5.371*	-7.938**	-7.245**	-6.490*	-7.804*	-5.397
	(5.156)	(3.865)	(3.673)	(4.091)	(3.802)	(3.010)	(1.084)	(3.094)	(3.740)	(3.425)	(3.401)	(4.136)	(3.560)
Election PATR: Left	-2.549	-0.212	-4.089	-2.189	-3.862	-2.051	0.940	-4.980	-4.101	-1.898	-4.924	-3.271	-2.555
	(4.709)	(3.545)	(3.383)	(4.101)	(3.769)	(3.188)	(1.149)	(3.113)	(4.267)	(3.858)	(3.840)	(4.080)	(4.090)
Election PATR	7.978*	5.161*	6.554**	6.650**	7.181**	6.010***	-0.784***	6.168**	6.811**	4.022	5.941*	8.585**	7.273**
	(4.553)	(3.110)	(2.916)	(3.349)	(3.036)	(2.246)	(0.269)	(2.427)	(3.277)	(2.880)	(3.204)	(3.544)	(3.376)
Right-wing	-1.109***	-1.076***	-1.378***	-1.161***	-1.296***	-1.259***	-0.922***	-1.461***	-1.395***	-1.143***	-1.295***	-1.332***	-1.172***
	(0.368)	(0.335)	(0.352)	(0.303)	(0.299)	(0.270)	(0.291)	(0.343)	(0.392)	(0.374)	(0.375)	(0.323)	(0.301)
Left-wing	-0.572	-0.540	-0.902**	-0.650*	-0.791**	-0.812**	-0.417	-1.003**	-0.952**	-0.660	-0.799*	-0.909**	-0.706*
	(0.419)	(0.397)	(0.430)	(0.376)	(0.377)	(0.359)	(0.391)	(0.440)	(0.460)	(0.467)	(0.448)	(0.385)	(0.378)
Coalition	-0.091	-0.105*	-0.111*	-0.099	-0.102	-0.099	-0.099	-0.109	-0.099	-0.089	-0.109	-0.111*	-0.102*
	(0.057)	(0.063)	(0.067)	(0.06)	(0.063)	(0.062)	(0.066)	(0.066)	(0.061)	(0.061)	(0.068)	(0.063)	(0.061)
Previous vote	0.534	0.491	0.392	0.429	0.398	0.444	0.569	0.428	0.486	0.624	0.430	0.392	0.470
	(0.410)	(0.397)	(0.426)	(0.386)	(0.407)	(0.399)	(0.440)	(0.410)	(0.402)	(0.410)	(0.404)	(0.392)	(0.381)
No. of observations	79	79	79	79	79	79	79	79	79	79	79	79	79
Log pseudo-likelihood	-32.06	-32.09	-32.10	-32.09	-32.10	-32.09	-32.11	-32.10	-32.10	-32.10	-32.10	-32.09	-32.09
No. of countries	16	16	16	16	16	16	16	16	16	16	16	16	16
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Table 6.10: QMLE Estimates of PATR on Incumbent Vote Share: CEECs

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	9.410	7.571	7.635	6.160	4.148	-0.559	0.717	4.467	3.257	3.182	-1.409	2.452	-0.912
	(5.744)	(6.932)	(7.625)	(8.352)	(8.172)	(8.239)	(2.173)	(5.113)	(2.014)	(2.367)	(4.146)	(3.265)	(3.838)
Election PATR: Left	-4.856	-10.66**	-13.44**	-8.364	-14.33**	-22.26***	-3.924***	-5.196**	-5.725***	-7.086***	-2.786	3.861	2.973
	(3.733)	(4.794)	(5.252)	(6.494)	(6.569)	(5.978)	(1.255)	(2.476)	(2.093)	(2.432)	(4.268)	(2.852)	(3.851)
Election PATR	-4.670**	-2.030	-1.984	-0.00992	3.517	9.107*	1.084	1.173	1.810	2.960*	0.765	-8.763***	-10.35***
	(2.236)	(3.522)	(4.289)	(5.664)	(5.667)	(5.058)	(1.066)	(2.396)	(1.528)	(1.692)	(3.504)	(2.614)	(3.376)
Right-wing	-1.593	-1.326	-1.616	-1.962*	-2.069*	-2.271*	-1.720	-2.371*	-2.038*	-2.454**	-2.046	-2.599**	-2.524*
	(1.170)	(1.096)	(1.039)	(1.141)	(1.251)	(1.317)	(1.116)	(1.239)	(1.104)	(1.138)	(1.447)	(1.312)	(1.406)
Left-wing	1.201	1.242	1.253	0.799	0.953	0.918	0.502	0.516	0.257	0.186	0.685	1.195	1.821
	(1.166)	(1.173)	(1.121)	(1.199)	(1.187)	(1.151)	(0.989)	(1.036)	(1.160)	(1.199)	(1.306)	(1.167)	(1.323)
Coalition	0.088	0.090	0.084	0.071	0.047	-0.010	-0.003	0.057	0.213	0.166	-0.016	0.128	0.167
	(0.129)	(0.131)	(0.135)	(0.147)	(0.153)	(0.152)	(0.121)	(0.125)	(0.159)	(0.150)	(0.156)	(0.126)	(0.133)
Previous vote	-0.252	0.119	0.043	-0.197	0.052	0.202	0.271	-0.238	-0.276	-0.180	-0.126	-0.671	-0.699
	(0.605)	(0.596)	(0.553)	(0.604)	(0.566)	(0.558)	(0.773)	(0.733)	(0.598)	(0.593)	(0.732)	(0.652)	(0.706)
No. of observations	53	53	53	53	53	53	53	53	53	53	53	53	53
Log pseudo-likelihood	-19.31	-19.31	-19.29	-19.40	-19.36	-19.30	-19.30	-19.30	-19.28	-19.26	-19.47	-19.26	-19.23
No. of countries	10	10	10	10	10	10	10	10	10	10	10	10	10
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Lithuania.

Regarding the CEECs, Table 6.10 shows that there is no significant evidence that the voters reward the right-wing government for an election-year decrease in the PATRs, which is in line with Table 6.4. However, unlike the established democracies, there is now evidence that left-wing governments are rewarded for cuts in PATRs. This holds for most of the household groups, but with the exception of HT1, HT4 and HT11 to HT13. This suggests that the voters in the CEECs are more likely to reward the parties that adopt policies that are different to their ideologies, so that the incumbent parties not only care about their ideologies, but also about the welfare of the voters and the economy as a whole (Tavares, 2004).

Overall, the finding is that voters in the West EU reward a right-wing party for a cut in the PATR in the election year. This can be explained by these parties being known for their emphasis on lower taxes compared to the left-wing party, so that voters sanction the incumbent based on its ideology. However, voters in the CEECs reward a left-wing party even if it adopts policies that are different from its own ideology. It can therefore be said that the main findings in Table 6.5 are influenced by these differences in voting between the West EU and CEECs.

6.5 Marginal Effects

This chapter has used the FE and QMLE methods to examine the effects of PATR on the vote share of the incumbent government. However, as the QMLE is a non-linear econometric model the coefficients do not represent the marginal effects from a change in PATR, although they do reveal the sign and statistical significance of the estimated effect. The purpose of this section is therefore to provide the marginal effects of the change in PATR on the incumbent vote share, given that it is either a right- or left-wing party. These are shown in Tables 6.10(a) and 6.10(b) respectively, where calculate the effect of the PATR change on the vote share if the incumbent government for right- and left-wing parties. The marginal effects from the FE results from Table 6.3 are also presented for comparison with the QMLE model results from Tables 6.4 to 6.10, with the exception of Tables 6.5 and 6.7, so that Tables 6.11(a) and 6.11(b) are divided and into six different parts: FE estimates, baseline QMLE estimates, pre-determined elections, weighted PATRs, West EU countries only and CEECs only. The marginal effect shows the magnitude of a change in the vote share for a unit change in the PATR.

On estimating the marginal effects of the baseline QMLE model, it can be seen there is no significant evidence that the voters reward the right-wing party for electoral-year cuts in the PATRs for either the household groups consisting of single individuals or married couples. The findings, however, suggest that a decrease in the PATR for the household groups consisting of single individuals (HT2, HT3 and HT7) and married couples (HT8 to HT10) lead to an increase

in the vote share of the incumbent government if it is of the left-wing party. It can be seen that a decrease of one percentage point in the PATRs increases the vote share of the left-wing party between 0.85 and 2.47 percentage points. The marginal effects of an election-year change in the PATR are stronger for the left-wing party compared to the right-wing party. The signs on the coefficients for the FE estimates follow a similar trend of the QMLE model, but the marginal effects are much larger under the FE estimator. However, given the problems associated with the FE estimator due to the non-linear nature of the dependent variable and that the predicted estimates may fall outside the 0 to 1 range, the focus is on the QMLE estimates.

The marginal effects for the QMLE estimations when the election dates are pre-determined and for the CEECs have the largest effects on the vote share. In addition, for these two sub-sections of Table 6.11(b) when considering the left-wing party, the variable *Election PATR* has the most significant effects across the household groups consisting of both the single individuals and married couples. Focusing on the pre-determined elections, an increase of one percentage point in the PATR for household group HT8 leads to an increase of 1.73 percentage points in the vote share of the right-wing party. A decrease of one percentage point in the PATR for the household groups HT1 to HT3, HT5 to HT10 and HT12 to HT13 lead to an increase in the vote share of the left-wing party by between 0.70 and 2.58 percentage points.

For the West EU, the marginal effects are larger for the left-wing party showing that the vote share increases following the increase in the PATRs for the household groups consisting of single individuals with two children (HT1, HT2 and HT4) and married couples with no children (HT12 and HT13). The vote share of the right-wing party by 2.22 percentage points when there is a decrease in the PATR for the household group HT1. The signs on the coefficient estimates of the marginal effects are plausible given that the right-wing party is known for tax cuts hence, it is rewarded for doing so, while the left-wing party is penalised for decreasing the PATRs in the run-up to an election. Overall, the marginal effects are larger for the CEECs as compared to the West EU. On comparing the marginal effect for the left-wing party in the West EU and CEECs, it can be seen that an increase of one percent point in the PATR (for the household groups HT1, HT2, HT4, HT12 and HT13) lead to an increase in the vote share between 1.57 and 1.91 percentage points in the West EU, while a decrease of one percent point in the PATR (for all of the household groups with the exception of HT11) lead to an increase in the vote share between 0.92 and 4.98 percentage points in the CEECs. These kinds of effect are largely unexplored in the literature, so this is a new contribution.

Table 6.11(a): Marginal Effect of Election PATR on Vote Share of Incumbent Government (Right-Wing Party)

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
(a) Table 6.4: FE Estimates													
Election PATR	4.170	6.291	4.197	7.878	5.275	5.382	0.653	4.153	0.906	0.472	2.965	7.743	7.299
(b) Table 6.5: Baseline QMLE Estimates													
Election PATR	0.440	0.937	0.544	1.117	0.655	0.707	0.109	0.515	0.069	-0.079	0.411	1.091	1.050
(c) Table 6.7: Pre-Determined Elections													
Election PATR	1.257	1.876	1.728	1.398	0.750	0.877	0.446	1.731*	1.541	2.079	1.073	1.350	1.078
(d) Table 6.8: Weighted PATRs													
Election PATR	0.331	0.264	0.186	0.140	0.060	-0.116	0.350***	0.039	0.003	-0.041	-0.006	-0.035	-0.070
(e) Table 6.9: West EU Only													
Election PATR	-2.223***	-0.026	0.090	0.871	0.436	0.640	-0.022	0.272	-0.385	-1.100	-0.187	0.266	0.641
(f) Table 6.10: CEECs Only													
Election PATR	1.393	1.628	1.662	1.811	2.260	2.521	0.526	1.654	1.482**	1.794**	-0.189	-1.862***	-3.296***

Notes: Relevant table indicated in parts (a) – (f). Significant at *** = 1%, ** = 5% and * = 10% level.

Table 6.11(b): Marginal Effect of Election PATR on Vote Share of Incumbent Government (Left-Wing Party)

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
(a) Table 6.4: FE Estimates													
Election PATR	-8.927	-12.30	-15.09**	-6.718	-9.053	-9.483	-4.999***	-7.469***	-11.85**	-14.40**	-4.894	-7.057	-6.847
(b) Table 6.5: Baseline QMLE Estimates													
Election PATR	-1.368	-1.994**	-2.474**	-1.011	-1.416	-1.360	-0.851***	-1.224***	-1.933***	-2.464***	-0.772	-0.995	-1.030
(c) Table 6.7: Pre-Determined Elections													
Election PATR	-2.145***	-2.501***	-2.581***	-1.332	-1.677**	-1.744*	-0.702***	-1.076***	-2.015***	-2.374***	-0.779	-1.799**	-1.421*
(d) Table 6.8: Weighted PATRs													
Election PATR	0.295	0.231	0.140	0.097	-0.027	-0.242	0.603*	-0.182	-0.216	-0.239	-0.176	-0.121	-0.159
(e) Table 6.9: West EU Only													
Election PATR	1.913***	1.746**	0.870	1.574*	1.171	1.397	0.055	0.420	0.956	0.749	0.359	1.873**	1.664*
(f) Table 6.10: CEECs Only													
Election PATR	-3.090***	-4.106***	-4.981***	-2.731**	-3.508***	-4.253***	-0.923***	-1.308***	-1.269**	-1.337*	-0.664	-1.588***	-2.386***

Notes: Relevant table indicated in table. Significant at *** = 1%, ** = 5% and * = 10% level.

6.6 Conclusions

This chapter examines whether electoral manipulations in the net Personal Average Tax Rate (PATR) affect the vote share of the incumbent government. It adds to the literature on electoral accountability by focusing on thirteen different household groups and the EU26 countries for the period, 1996 to 2016. It complements the findings of Chapter 5, where there is evidence of partisan electoral effects on the PATR, with left-wing parties in particular decreasing the PATR in the run-up to an election, so that there is opportunistic behaviour by these parties.

The chapter uses both Fixed Effects (FE) and Quasi-Maximum Likelihood Estimation (QMLE) methods to examine whether changes in the average income tax rates have an effect on the voting share of the incumbent government. According to studies, such as Jacoby (1994) and Arikan and Bloom (2015), it is expected that the supporters of the right-wing government prefer a cut in expenses in order to achieve a reduction in tax burden compared to the supporters of the left-wing government, who prefer government spending. As such it is expected that a right-wing government will be rewarded for PATR cuts, while a left-wing government will be rewarded for increases in the PATRs. However, when looking at the EU as a whole, the main QMLE findings of this chapter do not offer support for the effect on the vote share of the right-wing party of an election-year change in the PATRs. There is evidence that the vote share of the left-wing party increasing following an election-year cut in the PATRs that holds true for household groups consisting of both the single individuals (HT2, HT3 and HT5 to HT7) and married couples (HT8 to HT10). As such, the findings of this chapter indicate that the voters reward the left-wing party for its opportunistic behaviour.

A possible explanation for the negative effect for the left-wing party is that the voters associate the electoral cut with an improvement in social welfare, and therefore reward the left-wing party, even though it implements fiscal policies that are not consistent with its ideology. In line with the existing literature, there is also evidence that the voters have an understanding of the economic situation and reward / punish an incumbent party accordingly. More precisely, voters are likely to reward an incumbent party when there has been economic growth over the whole electoral period. This suggests voters are responsive to changes in the PATR.

The robustness of the QMLE finding is tested by examining the timing of an election, and in particular by restricting the sample to pre-determined elections, i.e., where they occur at a constitutionally fixed term. However, broadly similar results are found as there is no evidence that the vote share of the right-wing party is affected by an election-year change in the PATRs, while there is a similar finding for the left-wing governments, although not exactly the same household groups are affected. As mentioned in Chapter 4, for the thirteen household groups,

across the EU26 member countries, the population is mainly made up of married couples with two children, followed by married couples with no children, single individuals with no children and then finally single individuals with two children. As regards the main findings, the vote share of the incumbent government mainly relates to household groups consisting of the single individuals with no children and the married couples with two children. It can therefore be said that, to some extent, incumbents are aware of the population composition by socio-economic group and they engage in the electoral manipulations of the PATRs accordingly.

Separating the sample into the West EU and CEECs, as expected for the West EU the right-wing party is rewarded for an election-year cut in the PATR, while the left-wing party is rewarded for an increase in the PATRs. However, in the CEECs, there is no evidence regarding the effect of an election-year change in the PATRs on the vote share of the right-wing party, but it is found that the vote share of the left-wing party increases as a result of an election-year cut in the PATRs. The increase in the vote share of the left-wing party as a result of taxes can be explained by the fact the incumbent parties may implement policies that are different to their ideologies to improve the economy. Paradoxically, this signals their credibility, and the voters will reward the incumbent parties despite implementing policies different to their ideologies. Further, the magnitude of these election effects show that the effects are stronger in the CEECs compared to the West EU, with an increase in the vote share of a left-wing party in the CEECs of between 0.92 and 4.98 percentage points for a one percent point decrease in the PATRs for most household groups. The results indicate that the main findings regarding the effect of pre-election tax cuts are influenced by differences in voting between the West EU and CEECs.

In the next chapter the analysis is extended to examine voter rationality, and in particular whether voters continue to believe in the credibility of election-year manipulations in the PATR if the incumbent wins consecutive elections, so that the electorate is potentially able to observe the effect of previous manipulation of the economy around election time by the same party.

Chapter 7. The Credibility of Electoral Manipulations

7.1 Introduction

Chapter 5 shows that incumbent governments engage in the manipulation of the net Personal Average Tax Rate (PATR) for different household groups in order to gain electoral advantage. Further, the main findings in Chapter 6 show that voters can reward the incumbent government at election term for reductions in the PATR in the election year. While this analysis finds that there is no significant evidence that the voters reward right-wing parties for lower PATRs, there is nonetheless evidence that voters reward left-wing parties for decreases in the PATRs in the run-up to elections for the household groups consisting of either single individuals with no (or two) children and married couples with two children.

Notwithstanding these results, an important issue that arises is whether this kind of pre-electoral manipulation in the tax rates is credible, so that an incumbent can keep on 'fooling' the electorate election after election. This is because it may be expected that the electorate will learn *ex-post* from previous government manipulations of the economy. In particular, if an incumbent manipulates the PATR to gain an electoral advantage, then the question is whether the same kind of behaviour will work at the next election for the same incumbent, or whether such behaviour loses its credibility? It is an important issue that underlies the rational approach to the political business cycle, but empirically it is a relatively unexplored area.

The literature argues that voters will hold the governing party accountable with their vote (Strom, 2000). However, whether the electoral manipulation loses credibility over time hinges crucially on the time horizon used by the voters to assess the government's performance and the nature of the expectations that voters possess. As seen in Chapter 2, in the Nordhaus (1977) model if the voters are assumed to have adaptive expectations and are myopic, then they have short memories and take into account recent economic performance only in their decision-making process. In this case, an incumbent can take advantage by manipulating the economy as it can be consistently 'fooled' since they do not remember the past events. However, Chapter 2 also discusses the Rogoff and Sibert (1988) model, in which voters have rational expectations. In this case, rational behaviour means voters will learn from previous electoral manipulations that lead to adverse effects after an election, so that in this case the manipulations will lose their credibility, especially where the same incumbent government is involved.

Given that the voters can either be myopic or rational in their decision-making process, then it is possible to link the credibility of the electoral fiscal manipulations to the nature of the

voter expectations when it comes to electoral accountability. The objective of this chapter is to investigate if the voters can be 'fooled' repeatedly by the electoral manipulations. Since this must be explored for the same incumbent government then it involves comparing the effect of electoral manipulations for successive elections that are won by the same incumbent. As such, I restrict my attention to a subset of the elections considered in the previous chapters. The issue is whether an electoral manipulation of the economy loses its power to attract votes if the incumbent has potentially previously engaged in this kind of behaviour. The use of successive electoral terms is a powerful test of the credibility of repeated electoral manipulations, and hence of the nature of the expectations that are held by voters. The focus on consecutive governments is because only the winner of an election is in a position to manipulate the PATRs. Like the previous chapters I focus on *Election PATR*, which captures the effect of a change in PATR in the election year.

While based on the same dataset and previous empirical work carried out in this thesis, the chapter is somewhat self-contained, so I include here a review of the relevant literature on the credibility of electoral manipulations. Section 7.2 reviews the existing evidence on the nature of expectations, and hence the time horizon that is used by voters to reward or punish the incumbent government. Section 7.3 discusses the empirical framework, and the results are presented in Section 7.4. Again, I use a Fractional Probit estimator but now focus on just 63 elections, in which the same party wins successive elections in any of the EU26 countries over 1996-2016. Finally, Section 7.5 summarises the main findings and concludes this chapter.

7.2 Literature Review

The literature review in Chapter 2 is two-fold. First, there is a review of the different models of the political business cycle, and second it reviews whether the electoral manipulations have an effect on the re-election chances of the incumbent government. The objective of this chapter is to analyse if the fiscal manipulations carried out by the incumbent government at the current election are credible to voters if they were potentially carried out by the same incumbent at the previous election. As noted above, this will depend on the nature of voter expectations, and in particular whether the electorate is myopic or rational. In deciding whether to reward or punish the incumbent at the election, the literature focuses on two types of voter: those that give attention to the state of the economy in the short-run ('myopic voter') and those that focus on the whole electoral term ('rational voters'). This section reviews the studies that focus on the time horizon used by voters when deciding to reward or punish the incumbent at an election.

Usually, the economic state of a country during which an incumbent is in office helps the voters to decide who to vote for, but this depends on the nature of voter expectations. In the existing literature of political business cycles, some studies assume that voters are myopic, such that they do not take into account the post-electoral consequences of any manipulations prior to the election. However, if the incumbent wins the election, then coupled with a decaying memory, it means that the electorate will also not remember the previous manipulation by the same party that had adverse consequences at the beginning of the electoral term. In particular, as seen from Chapter 2, in the Nordhaus (1975) model the incumbent decreases unemployment by overstimulating the economy before an election, but causing higher than expected inflation after the election. The incumbent does this in an attempt to influence voters and increase its re-election chances. Under the Nordhaus model, the incumbent can repeatedly engage in these pre-electoral expansions and post-electoral contractions since the voters are myopic, while they have short memories and only remember the incumbent's recent economic performance. As such, the incumbent government can repeatedly 'fool' the voters through this behaviour.

There are some reasons proposed as to why voters are myopic. According to Kayser and Peress (2012), the media tends not to report the economic situation during the entire term of the incumbent, but rather focus on the current year performance, which may possibly explain why myopic voters base their voting decisions on the recent economic events. Healy and Lenz (2014) mention that voters are myopic due to the lack information, thus they prefer to rely on the election-year performance. Furthermore, Healy and Lenz (2014) suggest that the voters are politically engaged when the election is approaching, so they use recent information instead of previous information when deciding who to elect at the election. Of course, it may also be the case that voters are forgetful or that recent events are a better predictor of the future.

Studies have investigated whether voters sanction the incumbent government based on its short-run performance, and these are reviewed next. While it can be seen from Chapter 2 that the evidence for the Nordhaus model is far from conclusive, Nannestad and Paldam (1994) find that from a survey of studies on vote and popularity functions, voters use information for about two months prior to an election to evaluate the government's performance. Clarke *et al.* (1998) also find that voters tend to rely on the short-run economic performance to reward UK incumbent governments. Likewise, using survey data for 19 countries, Duch and Stevenson (2006) find that voters take into account recent economic performance.

Huber *et al*. (2012) use an experimental approach to examine how voters assess the performance of the government. One of their key findings is that voters give more importance to government performance that is later in the electoral term compared to that throughout this period. The reason is that voters cannot remember how the incumbent performed throughout

its term in office, and so have to rely on recent information. In his study, Bartels (2008) finds evidence that candidates of the US Republican Party are more likely to win an election if there is a sound economy in the election year. According to Healy and Lenz (2014), if voters are myopic and sanction the incumbent based on fiscal manipulations in the election-year, then voters are in fact more likely to choose the best manipulator of fiscal policies, which suggests that they are 'fooled' and that the manipulation is credible. Achen and Bartels (2004) and Sobel and Leeson (2006) argue that if voters are myopic and reward the incumbent for recent policy, then the incumbent has an incentive to implement opportunistic short-term fiscal policies.

Several studies, including Beck (1984), Hibbs (1987) and Alesina and Roubini (1992), conclude that the political business cycle of the Nordhaus (1975) model does not exist. More specifically, these studies argue that the presumption that the incumbent government can fool the voters is false because the voters are not myopic. This has led to a different strand of the literature that assumes that voters are rational rather than myopic. Rational voters understand the underlying economic model, so that they base their decision-making on the past economic performance over the entire electoral term, including any past government manipulation.

If the voters are completely rational and fully informed then they cannot be fooled by the incumbent politician through electoral manipulations of the fiscal policies. Of course, in the Rogoff and Sibert (1988) model, there is an information asymmetry between the incumbent and voters. This asymmetry arises as an incumbent knows about its own competence, before it is revealed to the voters following an election. The incumbent government takes advantage of this information asymmetry to adopt expansionary fiscal policies before the election in order to win votes. In the Rogoff and Sibert model, voters' perception of competence determines the incumbent's re-election chances. If voters are uninformed they may be fooled by the electoral manipulations, but of course in the process of winning the previous election the competence of the incumbent is known by the electorate. It would not be expected that they would be fooled again, so that this offers a different prediction to the Nordhaus model. Aytaç (2018) suggests that voters are rational in their judgements about an incumbent government's performance since they compare the economic position of a country relative to its past position. Consequently, if the voters are rational, then the incumbent has an incentive to implement policies that improve the economy over their entire time in office (Hellwig and Marinova, 2015).

While some studies have found that the voters take into account a short time horizon in deciding whether to vote for the incumbent government, some studies have been carried out to examine if the voters rely on the economic performance over the whole term of the incumbent. Focusing on US presidential elections over the period from 1952 to 2012, Wlezien (2015) finds that voters are not myopic all of the time. He finds that voters take into account the economic

performance at least two years prior to an election when voting for the candidates at an election. Hellwig and Marinova (2015) examine whether voters rely on recent information or take into account the economic performance over the incumbent's full term in office when voting. Using survey data for the US, they find that voters are not myopic since they do not rely on the recent economic performance of the incumbent when voting, but rather they find voters experience a lack of information. Otherwise, they find that voters are accurate with regard to the economic performance of the government, both in the short- and long-run.

Using data for the post-war period, Clegg (2016) investigates the effect of economic performance on the vote share of UK incumbent governments. He finds that the short-term growth in household per capita income has a smaller effect on the vote share of the incumbent government compared to the long-term effect, so that voters are not myopic. Like Hellwig and Marinova, Jankowski (2018) finds that voters can differentiate between the short- and long-term economic performance, but that voters are misinformed. Stiers and Kern (2018) find that voters evaluate the incumbent differently during its time in office in the Unites States. Their findings indicate that the economic state of the country receives less attention at the beginning of the incumbent's term, but that voters hold the incumbent accountable for the economic state of the country at the end of the term of office.

Overall, the literature does not offer clear guidance on the nature of voter expectations and the timing and length of period that the voters use in order to reward or to punish the incumbent government at election time. Some studies find that voters rely only on short-term performance, but others that they take into account economic performance over the whole electoral term when the government is in office, so that they exhibit rational behaviour, albeit perhaps experiencing less than full information on the competence of the government. In the remainder of this chapter, I investigate whether the electoral manipulations of the PATR by an incumbent government are credible if the incumbent is re-elected. These results provide some further evidence on whether the electorate is myopic or rational in its voting behaviour.

7.3 The Framework

Chapters 5 and 6 provide evidence of electoral manipulations by the incumbent government in the average income tax rates for some household types to increase its re-election prospects. The main finding of Chapter 5 is that the left-wing party decreases the PATR for the household groups consisting of married couples with two children (HT8 to HT11), while Chapter 6 shows that the left-wing party is rewarded following the cut in the PATR for the household groups consisting of single individuals with no children (HT2 and HT3), single individuals with two

children (HT7) or married couples with two children (HT8 to HT10). Overall, these chapters show that electoral manipulations of the PATR exist and affect the incumbent's vote share.

Given these findings, this chapter seeks to analyse that if an incumbent government wins consecutive elections and it engages in electoral manipulations of the average income tax rate in the second term, whether the voters believe these electoral manipulations. One way to address this is to focus on the consecutive elections won by the same incumbent government, so that two electoral periods are observed. I therefore test the effects for consecutive electoral terms won by the same incumbent, as follows, and then examine differences in these:

- Aim 1: *In the election year of the first election period*, to test the effect of a change in the PATR on the vote share of the incumbent government relative to that for the average of the previous years for the first term of office.

- Aim 2: *In the election year of the second election period*, to test the effect of a change in the PATR on the vote share of the incumbent government relative to that for the average of the previous years for the second term of office.

If the voters' decision-making is based on recent events and they believe that a recent improvement in the economy is due to the government, then they will reward the incumbent, so that it is able to 'fool' the voters by implementing expansionary fiscal policies prior to an election, but with possibly adverse consequences afterwards. If this is repeated for successive elections for the same incumbent, so that the strength of the effect in Aim 2 is not significantly weaker than that in Aim 1, then it is reasonable to suppose that the voters are myopic.

However, if the electorate is rational, but experiences asymmetric information, then in the second election it will have been able to observe the government's competence from the previous election and learnt this. In this way any attempt to manipulate the economy will lack credibility and have no effect on voting. Consequently, it is expected that if voters are rational and they understand the electoral manipulations, then the strength of the effect in Aim 2 will be insignificant or at least significantly weaker than that found for Aim 1.

7.3.1 *Consecutive Elections*

In this chapter I focus on the electoral manipulation of the PATR for different household types, which has been analysed in Chapters 5 and 6. In Chapter 6, I find that across the EU26 member

countries, there is no evidence that the vote share of the right-wing party increases as the PATR in the election year decreases, but that the left-wing party is rewarded following a decrease in the PATR in the election year. Of course, in this chapter I do not consider all elections, but I focus only on those elections where a party wins (two or more) consecutive elections only in order to examine the credibility of the manipulations in the PATR. The issue is that having observed an incumbent's competency following the first election, whether the manipulation of the PATR at election time has the same or weaker effect on the vote share at the subsequent election. If the effect on the incumbent vote share is statistically significant in the second electoral period and does not differ from that of the first electoral period, then it is plausible that the voters are myopic in their voting behaviour. However, if voters are rational, the effect in the second electoral period will not be statistically significant or at least weaker compared to the first election, as rational voters will learn the incumbent's competency.

The focus on consecutive elections restricts the sample of elections, but in the European Union there are in fact 34 instances of a party winning consecutive elections over my study period 1996-2016, which accounts for 63 of the 135 elections. This includes parties that win two or more consecutive elections. In fact, the same party wins two consecutive elections 24 times, which accounts for 48 elections, while there are a further 5 cases where the same party wins three consecutive elections. In the latter case, these are treated as two observations on consecutive elections, i.e., the first and second elections, and the second and third elections, so that in total there are 34 observations on consecutive elections won by the same party. Since these further 5 cases involve elections that are both the first and second elections, then in total the regression involves 63 of the 135 elections, i.e., 48 + 15 = 63 elections.

In general, an election is considered as a consecutive one if the same party is re-elected. If it is a coalition government, the election is considered to be a consecutive one if the appointed prime minister is from the same party as the previous one. If an incumbent party wins two consecutive elections, but the full second term is not observed over 1996-2016, then these observations are omitted. For instance, the same party won in 2010 and 2014 in Belgium, and although it is possible to examine the effect of a change in PATR on the vote share during the first electoral period, it is not possible to do so for the second period as the next election took place in 2019, which is outside the sample period. There are no consecutive elections in Italy, Latvia, Lithuania and Romania. Table 7.1 shows a breakdown by country of the number of consecutive elections that have occurred in the EU26 over the 1996-2016 period.

Table 7.1: Consecutive Elections

Country	Elections in dataset:			Consecutive elections won by (%):		
	All elections* (No.)	Consecutive elections (No.)	Consecutive elections (%)	Right-wing party	Left-wing party	Centre-of party
West EU:						
Austria	5	2	40	0	100	0
Belgium	5	2	40	100	0	0
Denmark	6	4	67	100	0	0
Finland	5	2	40	0	0	100
France	4	2	50	100	0	0
Germany	5	3	60	0	100	0
Greece	6	4	67	50	50	0
Ireland	5	3	57	0	0	100
Italy	4	0	0	0	0	0
Luxembourg	4	3	75	0	0	100
Malta	4	3	75	100	0	0
Netherlands	6	2	33	100	0	0
Portugal	6	2	33	0	100	0
Spain	6	6	100	67	33	0
Sweden	5	4	80	0	100	0
UK	5	2	40	0	100	0
CEECs:						
Bulgaria	6	2	33	100	0	0
Czech Republic	5	2	40	0	100	0
Estonia	5	4	80	0	0	100
Hungary	5	3	57	0	100	0
Latvia	6	0	0	0	0	0
Lithuania	5	0	0	0	0	0
Poland	6	2	33	100	0	0
Romania	5	0	0	0	0	0
Slovakia	6	4	67	0	50	50
Slovenia	5	2	40	0	100	0
EU26:	135	63	47	-	-	-

Note: * Excluding first election in 1996.

Overall, the sample consists of 143 elections across the EU26, but only 135 observations are taken into account as for eight countries (Czech Republic, Greece, Italy, Lithuania, Malta, Romania, Slovenia and Spain) the previous vote share of the incumbent government is not observed prior to the 1996. Inspection of Table 7.1 shows that there are seven countries with a right-wing party that has won consecutive elections, eight countries with a left-wing party and four countries with centre-of party. In Greece [Slovakia], 50% of the consecutive elections are won by the right-wing party [left-wing party] and the other 50% by the left-wing party [centre-of party]. In Spain 67% of the consecutive elections are won by the right-wing parties and 33% by the left-wing parties.

7.3.2 *Econometric Specification*

Like Chapter 6, the increase in the vote share of the incumbent government is used to capture whether the voters will reward or punish the incumbent government at election time related to the past level of the PATR for each household group. For this purpose, I regress the following specification across the consecutive elections only(i.e., across both the first and second elections), where i and t are country and year indicators:

$$VS_{it}^{C} = a(Election\ PATR\ \times\ Ideology\ of\ Government\ if\ Win(I))_{i,t} + \beta(Election\ PATR\ \times\ Ideology\ of\ Government\ if\ Win(II))_{i,t} + \gamma X_{i,t} + \delta Previous\ Vote_{i} + \lambda Z_{i,t} + \mu_{i} + u_{i,t}, \quad (7.1)$$

As in Chapter 6, the dependent variable, VS^{C}, is the vote share of the incumbent government in the election year. As regards the independent variable, three different PATR measures are used in Chapter 6, of which *Election PATR* gives the most plausible findings. This is measured as the change between the PATR in the election year and the annual average PATR over the electoral term, starting with the last election year and excluding the current election year. It is *Election PATR* that is the focus of this chapter.

To investigate Aims 1 and 2 in Section 7.3 above, two interaction terms are included on *Election PATR*, where *Win(I)* is a dummy variable that is has a value of one if the incumbent government wins the election in the first electoral term of consecutive elections, but is zero otherwise; *Win(II*) is a dummy variable that has a value of one if the incumbent government wins the election in the second electoral term, but is zero otherwise. Given these definitions, the first interaction term in Equation (7.1), that is, $Election\ PATR\ \times\ Ideology\ of\ Government\ if\ Win(I)$, captures the effect of a change in the PATR in the election year on the vote share of the government in the first electoral period, and the second interaction term, $Election\ PATR\ \times\ Ideology\ of\ Government\ if\ Win(II)$, measures the effect of a change in the PATR in the election year on the vote share of the incumbent in the second electoral period. It therefore captures the credibility of the electoral manipulation, i.e., whether the voters reward the incumbent if it engages in electoral manipulations in the second electoral period, and can be compared to that of the first electoral term. It should be noted that the interaction terms differentiate between whether the incumbent party is a right-wing party or left-wing party. For example, in the UK, the Labour Party (a left-wing party) won consecutive elections in 1997 and 2001, so in this case *Win(I) Left-wing* is equal to one for the year 1997

and *Win(II) Left-wing* is one in the year 2001 (zero otherwise). In the case of a party winning three consecutive elections, *Win(I)* and *Win(II)* are allowed to be equal to one simultaneously, that is, when *Win(II)* is capturing the effect in the second electoral period for the first and second consecutive elections, and *Win(I)* is capturing the effect in the first electoral period for the second and third consecutive elections. As such, the observations on three winning consecutive elections are treated as two observations on consecutive elections, as explained in Section 7.3.1.

The term *X* in Equation (7.1) consists of the dummy variables *Win(I) Right-wing*, *Win(I) Left-wing*, *Win(II) Right-wing* and *Win(II) Left-wing*. The term *X* also includes the variable that captures if the incumbent government is a coalition government or not. The term *Previous Vote* is the vote share of the same party at the previous election. As in Chapter 6, $Z_{i,t}$ are socio-economic terms: GDP, GDP per capita, GDP growth, inflation and unemployment rates, government expenditure and a variable for the illiteracy rate. Like Chapter 6, these variables are measured as the average over the electoral term. As mentioned in Chapter 4, and similar to Chapters 5 and 6, the variables GDP and GDP per capita are positively skewed, so that a logarithmic transformation of these two variables is used in this chapter as well. Unlike, in Chapters 5 and 6, where the logarithmic transformation of *Inflation* is used because it has a minimum value of -4.48% and a maximum value of 1058.4%, in this chapter the logarithmic transformation of *Inflation* is not required as the extreme value is not included in the smaller sample. The vote share of the incumbent government, the economic and coalition variables are discussed in Chapter 4. The descriptive statistics of the variables used in this chapter are shown in Appendix Table 7.1. The terms, μ_i and $u_{i,t}$, are country-specific and unobserved error terms respectively, where country fixed effects are included to control for the unobserved heterogeneity. As discussed in Chapter 4, since the incumbent vote share is bounded between the value 0 and 1, Equation (7.1) is estimated using the Fractional Probit estimator. As this is non-linear, the marginal effects are also presented below.

The focus of this chapter is on consecutive governments as It should be noted that there are actually three elections that are being considered when accounting for the consecutive elections. More specifically, a party, *i*, wins the first election, and the electoral effect of PATRs on the vote share of party *i* at the second and third elections is examined. At the first election, there is no difference made between whether the party is competent or incompetent such that the performance of the incumbent party is only observed at a later stage. I restrict attention to winners only at the first election since they are the only ones to have control over the PATRs. With respect to the consecutive elections, although the incumbent wins again at the second election, this does not imply that the party is competent or incompetent, winning the election could be the result of manipulating the PATRs during its term in office, even if it is later

observed to be incompetent. Moreover, from Table 7.1, it can be seen that, out of the 63 consecutive elections, there are only 11 cases, where an incumbent wins more than 2 consecutive elections. As such, endogeneity is not considered to be an issue when estimating equation (7.1) as it is assumed that the incumbent is in a position to manipulate the PATRs, and this does not depend on whether the incumbent is competent or incompetent.

7.4 Regression Results

In this section, I first re-estimate the key regression from Chapter 6 in Table 6.5, using the smaller sample of 63 observations. This makes no distinction between consecutive elections, and the results are presented in section 7.4.1 below, showing that broadly comparable results are obtained. Secondly, in section 7.4.2, the results from regressing equation (7.1) are given.

7.4.1 *Re-Estimating Main Equation with New Sample*

In order to compare the main findings from Chapter 6, Equation (4.2) is re-estimated using the sample of 63 elections, i.e., where the incumbent government wins consecutive elections, but making no distinction between first and second elections. In fact, the number of observations is lower than this, at 61 elections, since two observations are lost as the inflation rate is negative for Bulgaria in 2014 and Greece in 2015. Equation (4.2) is regressed to examine the effects of a change in the PATR in the election year on the incumbent vote share using the Quasi-Maximum Likelihood Estimator (QMLE). The results using the sample are given in Tables 7.2(a) and 7.2(b) for the household groups of single individuals and married couples, respectively.

Overall, the results are similar to Chapter 6 in that the vote share of the left-wing party increases as a result of a lower PATR in the election year. This is the case for household groups consisting of single individuals (HT1, HT2, HT6 and HT7) and married couples (HT8 to HT12). This is like Tables 6.5(a) and 6.5(b), although not all of the coefficient estimates are statistically significant for the same household groups. Notwithstanding this, there is evidence that the voters reward the right-wing party for a decrease in the PATRs, but for household groups HT1, HT6 and HT8 to HT12 in Tables 7.2(a) and 7.2(b), whereas there is no evidence for this in Tables 6.5(a) and 6.5(b). There exist some other differences, while the signs on the coefficient estimates of the variables *Right-wing* and *Left-wing* are like that of Table 6.5, the coefficient estimates of *Coalition* are positive, but not statistically significant. In addition, while the

estimates of *Previous vote* are positive but insignificant in Table 6.5, they are now negative and significant, although only for household group HT11. This suggests governments that have received a lower percentage of votes in the previous election are likely to experience a decrease in their vote share in the next election. This might just reflect the smaller sample size, but also that I include only those elections where the same party wins consecutive elections, which we have so far not allowed for, and may explain the above differences in the estimates.

Finally, regarding the controls in Tables 7.2(a) and 7.2(b), there is evidence that *GDP* has a negative effect on the vote share of the incumbent government, whereas it is expected that an improvement in the economy will be rewarded by the voters. *GDP per capita* and *GDP growth* indeed have a positive effect on the vote share of the incumbent government. While it is expected that *Inflation* has a negative effect on the vote share of the incumbent government, the opposite is observed in Tables 7.2(a) and 7.2(b), but this is similar to Chapter 6. Higher *Unemployment* leads to an increase in the incumbent vote share, but the coefficient estimates are not significant. In Equation (4.2), government expenditure is interacted with the ideologies, and Tables 7.2(a) and 7.2(b) show evidence of the left-wing party is likely to be penalised for an increase in government expenditure, although it is expected that they are rewarded, given the emphasis the left-wing party put on public spending. The variable *Illiteracy* has no significant effect on the vote share of the government in Tables 7.2(a) and 7.2(b).

Table 7.2(a): QMLE Estimates of PATR on Incumbent Vote Share: Single-Individual Households

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7
Election PATR: Right	-25.86***	-8.739	-4.826	-4.592	-6.419	-11.61*	-1.943
	(4.455)	(5.880)	(6.911)	(7.215)	(7.405)	(6.181)	(1.372)
Election PATR: Left	-25.42***	-13.01**	-9.382	-7.250	-10.75	-14.85**	-1.836*
	(4.774)	(5.995)	(6.991)	(7.606)	(7.583)	(6.607)	(1.006)
Election PATR	20.24***	5.896	2.125	3.981	6.633	11.72*	-0.010
	(4.139)	(6.145)	(7.030)	(7.145)	(7.310)	(6.030)	(0.852)
Right-wing	-1.550***	-0.714	-0.514	-0.406	-0.653	-0.971	0.107
	(0.526)	(0.748)	(0.843)	(0.781)	(0.812)	(0.810)	(0.586)
Left-wing	0.695	1.655*	1.851*	1.770*	1.675*	1.202	1.966***
	(0.624)	(0.954)	(1.054)	(0.947)	(0.998)	(1.036)	(0.647)
Coalition	0.009	0.047	0.051	0.031	0.034	-0.021	0.037
	(0.126)	(0.128)	(0.131)	(0.133)	(0.136)	(0.139)	(0.109)
Previous Vote	-0.723	-0.402	-0.557	-0.805	-0.729	-0.847	-0.502
	(0.560)	(0.634)	(0.653)	(0.782)	(0.737)	(0.768)	(0.791)
Constant	-21.68***	-20.09***	-18.63**	-22.07***	-24.53***	-32.17***	-20.16**
	(5.463)	(6.498)	(8.309)	(7.661)	(7.490)	(6.815)	(8.544)
Control Variables:							
ln *GDP*	-2.815***	-2.513***	-2.288**	-2.684***	-3.028***	-4.071***	-2.345**
	(0.674)	(0.812)	(1.092)	(0.993)	(0.989)	(0.909)	(1.058)
ln *GDP per capita*	3.220***	2.932***	2.758**	3.288***	3.591***	4.702***	3.088**
	(0.782)	(0.972)	(1.226)	(1.157)	(1.154)	(1.094)	(1.221)
GDP growth	3.439***	2.120*	1.951	2.631*	2.925**	3.220***	2.408*
	(1.134)	(1.271)	(1.351)	(1.368)	(1.301)	(1.213)	(1.388)
ln *Inflation*	0.102***	0.081**	0.072**	0.069**	0.071**	0.067*	0.091***
	(0.030)	(0.032)	(0.034)	(0.035)	(0.035)	(0.035)	(0.032)
Unemployment	0.104	0.196	0.186	0.312	0.401	0.735	-0.017
	(0.977)	(0.946)	(0.965)	(0.993)	(0.989)	(1.005)	(1.070)
Govt exp: *Right*	4.494***	2.508	2.045	1.830	2.419	3.253*	0.622
	(1.265)	(1.811)	(2.030)	(1.880)	(1.963)	(1.973)	(1.376)
Govt exp: *Left*	-0.090	-2.339	-2.806	-2.641	-2.390	-1.185	-3.117**
	(1.404)	(2.161)	(2.416)	(2.153)	(2.286)	(2.369)	(1.415)
Govt exp	-1.517	-0.345	0.044	0.411	0.160	-0.792	1.244
	(1.170)	(1.776)	(1.985)	(1.850)	(1.970)	(2.132)	(1.497)
Illiteracy	-0.004	0.268	0.552	0.569	0.379	0.062	1.097
	(0.982)	(0.906)	(0.958)	(0.900)	(0.856)	(0.841)	(0.927)
No. of observations	61	61	61	61	61	61	61
Log-Pseudo likelihood	-24.73	-24.77	-24.79	-24.81	-24.80	-24.79	-24.78
No. of countries	22	22	22	22	22	22	22
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Table 7.2(b): QMLE Estimates of PATR on Incumbent Vote Share: Married-Couple Households

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR:	-10.94***	-11.61***	-7.885**	-14.57***	-12.41*	-3.931
Right	(3.042)	(3.000)	(3.791)	(3.359)	(7.103)	(7.440)
Election PATR:	-13.04***	-15.67***	-11.88***	-19.33***	-14.68*	-7.047
Left	(2.894)	(2.795)	(3.952)	(3.234)	(7.835)	(7.838)
Election PATR	10.73***	10.42***	5.164	14.04***	10.70	3.745
	(2.956)	(2.672)	(3.814)	(2.798)	(7.312)	(7.373)
Right-wing	-1.663***	-1.504**	-0.846	-1.900***	-0.951	-0.414
	(0.571)	(0.595)	(0.799)	(0.551)	(0.916)	(0.805)
Left-wing	0.512	1.003	1.397	0.612	1.366	1.806*
	(0.606)	(0.682)	(0.920)	(0.535)	(1.105)	(0.960)
Coalition	0.018	0.043	0.033	0.045	0.034	0.038
	(0.123)	(0.121)	(0.116)	(0.121)	(0.137)	(0.133)
Previous Vote	-0.690	-0.698	-0.503	-1.355**	-0.762	-0.797
	(0.710)	(0.686)	(0.707)	(0.559)	(0.753)	(0.780)
Constant	-23.30***	-21.07***	-18.75***	-24.31***	-24.43***	-21.67***
	(6.019)	(5.281)	(5.379)	(5.836)	(5.848)	(7.676)
Control Variables:						
ln *GDP*	-2.898***	-2.592***	-2.300***	-3.063***	-3.069***	-2.631***
	(0.719)	(0.624)	(0.643)	(0.701)	(0.744)	(0.994)
ln *GDP per capita*	3.669***	3.356***	2.853***	3.984***	3.608***	3.229***
	(0.948)	(0.796)	(0.812)	(0.901)	(0.929)	(1.155)
GDP growth	4.420***	3.884***	2.645**	3.476***	3.103**	2.645*
	(1.356)	(1.250)	(1.301)	(1.282)	(1.277)	(1.393)
ln *Inflation*	0.083***	0.084**	0.078**	0.036	0.080**	0.069**
	(0.032)	(0.035)	(0.034)	(0.037)	(0.034)	(0.035)
Unemployment	0.532	0.535	0.009	0.849	0.448	0.383
	(0.994)	(1.012)	(1.050)	(1.076)	(1.012)	(0.986)
Govt exp: *Right*	4.914***	4.590***	2.923	5.739***	3.140	1.839
	(1.355)	(1.421)	(1.924)	(1.306)	(2.216)	(1.935)
Govt exp: *Left*	0.433	-0.610	-1.694	0.575	-1.638	-2.727
	(1.352)	(1.513)	(2.088)	(1.191)	(2.529)	(2.180)
Govt exp	-1.708	-1.453	-0.435	-3.185***	-0.594	0.405
	(1.221)	(1.310)	(1.847)	(0.979)	(2.117)	(1.861)
Illiteracy	0.458	0.695	0.555	0.505	0.213	0.595
	(0.875)	(0.930)	(0.897)	(0.919)	(0.889)	(0.942)
No. of observations	61	61	61	61	61	61
Log-Pseudo likelihood	-24.74	-24.74	-24.76	-24.71	-24.79	-24.81
No. of countries	22	22	22	22	22	22
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level.
The reference country is Luxembourg.

7.4.2 *Results for Consecutive Elections*

This section presents the QMLE results from regressing Equation (7.1) using the sample that consists only of the consecutive elections that are won by the same incumbent government over 1996-2016. The purpose is to examine if the voters are rational and are able to understand the electoral manipulations in the PATR given that the incumbent government has been in power for consecutive electoral periods. More specifically, it is expected that if the voters are rational then the effect of a change in the PATR in the second electoral period on the vote share of the incumbent government (the interaction terms between *Win(II)* and the government ideology - Aim 2) is lower than the effect in the first electoral period (the interaction terms between *Win(I)* and the government ideology - Aim 1), and possibly insignificant. If so, then this is evidence that electoral manipulations of the PATR in the second election when the incumbent has been in office for two consecutive electoral terms lack credibility and that the voters have a rational behaviour. It implies that the electorate learns about the competency of the incumbent, offering support for the rational version of the political cycle, i.e., for the political budget cycle.

The full QMLE results, including the control variables, from regressing Equation (7.1) using the sample of the consecutive elections only are given in Appendix Table 7.2, while those of interest are reproduced in Table 7.3. First of all, in the case, of the control variables Appendix Table 7.2 shows that only some of these terms are statistically significant at the 1% level, but no doubt due to the smaller number of observations. Nevertheless, the signs on the coefficient estimates are similar to Table 7.2. Regarding the variables capturing the government ideologies in both the first and second electoral periods, the results indicate a robust positive effect on the vote share of the incumbent government. However, while it is expected that the governments receiving a higher percentage of votes in the previous election are likely to perform better in the next election, the estimates in Appendix Table 7.2 indicate otherwise.

The estimates of the interaction terms between *Election PATR* and government ideology with respect to whether it is the first *Win(I)* or second *Win(II)* electoral term are given in Table 7.3. With regard to *Win(I)*, Table 7.3 shows that if the right-wing party wins the first election, then a decrease in the PATRs in the election year of this first term leads to an increase in the vote share of the incumbent, and this holds true for the household groups HT1, HT8 and HT11 as compared to the centre-of party. Further, in Table 7.3, there is evidence that the left-wing party is also rewarded when the PATR is decreased in the election year of the first election term for the household groups HT1, HT7 to HT11 as compared to the centre-of party. The results for both the right- and left-wing parties follow a similar pattern to Table 7.2, although again not for exactly the same household groups.

Table 7.3: Effect of PATR in the Election Year on Incumbent Vote Share for Consecutive Elections

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Win(I) Right	-17.19***	-3.751	2.536	3.155	2.924	3.715	0.271	-7.898***	-3.042	-1.908	-10.66***	-1.107	2.448
	(5.436)	(5.574)	(6.190)	(6.937)	(6.763)	(5.500)	(1.398)	(2.415)	(2.208)	(3.971)	(3.483)	(5.435)	(8.173)
	[-1.205]	[-0.166]	[0.237]	[0.778]	[0.723]	[1.106]	[0.289]	[-1.009]	[0.407]	[-0.205]	[-1.015]	[0.296]	[0.368]
Election PATR: Win(II)Right	-16.23***	-5.742	1.115	5.741	5.552	9.225	-1.749	-12.04**	-9.956***	-5.146	-5.635	-3.295	5.440
	(3.486)	(5.066)	(5.893)	(7.599)	(7.765)	(7.917)	(1.508)	(4.997)	(3.337)	(4.564)	(4.950)	(5.035)	(8.278)
	[-0.875]	[-0.770]	[-0.206]	[1.523]	[1.483]	[2.720]	[-0.343]	[-2.225]	[-1.727]	[-1.181]	[0.550]	[-0.390]	[1.259]
Election PATR: Win(I) Left	-16.39***	-6.931	-2.374	-0.002	-0.300	2.395	-1.819**	-7.774***	-8.271***	-5.763*	-11.17***	-4.245	0.215
	(2.753)	(4.480)	(5.465)	(6.368)	(6.266)	(6.148)	(0.904)	(1.598)	(1.729)	(3.218)	(2.212)	(5.256)	(6.692)
	[-1.246]	[-1.507]	[-1.699]	[-0.395]	[-0.442]	[0.780]	[-0.690]	[-0.931]	[-1.577]	[-1.714]	[-1.399]	[-0.981]	[-0.447]
Election PATR: Win(II) Left	-14.05***	-5.631*	-1.057	2.905	3.399	7.214	-4.477*	-5.541*	-6.473*	-3.833	-5.561*	-3.785	3.253
	(3.696)	(3.355)	(4.653)	(5.546)	(5.488)	(4.977)	(2.354)	(3.104)	(3.366)	(3.035)	(3.211)	(4.803)	(5.728)
	[-0.405]	[-1.000]	[-1.193]	[0.489]	[0.680]	[2.143]	[-1.422]	[-0.179]	[-0.913]	[-1.013]	[0.392]	[-0.766]	[0.478]
No. of obs.	63	63	63	63	63	63	63	63	63	63	63	63	63
Log-Pseudo likelihood	-25.56	-25.59	-25.60	-25.60	-25.60	-25.60	-25.58	-25.57	-25.57	-25.59	-25.56	-25.60	-25.60
Test 1 p-value (*Right-wing*)	0.405	0.846	0.779	0.118	0.097	0.055	0.938	0.867	0.960	0.804	0.081	0.809	0.085
Test 1 p-value (*Left-wing*)	0.163	0.346	0.356	0.160	0.111	0.121	0.886	0.193	0.264	0.266	0.015	0.448	0.160
No. of countries	22	22	22	22	22	22	22	22	22	22	22	22	22
Country Fix. Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (7.1). Full results given in Appendix Table 7.2. *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Test 1 tests that the coefficient on *Election PATR: Win(I)* is greater than or equal to that on *Election PATR: Win(II)*. Robust standard errors in parentheses and marginal effects between brackets. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

With regard to the second electoral period, the effects of an election-year change in the PATR on the vote share of the incumbent government are captured by the variable *Win(II)* in Table 7.3. In this case, there is evidence that a change in the PATR for the household groups HT1, HT8 and HT9 in the election year of the second term has an effect on the vote share of the right-wing party as compared to the centre-of party. In the case of the left-wing party there is evidence for household groups HT1, HT2, HT7 to HT9 and HT11. It can be noted that the coefficient estimates of the interaction terms (i.e., *Election PATR: Win(II) Left*) for the household groups HT1 to HT3 and HT8 to HT12 are smaller than those found for the respective terms in the first period. As a further step, I test the null hypothesis that the coefficients on the variable *Election PATR: Win(I)* are greater than or equal to that on *Election PATR: Win(II)*, with respect to its government ideologies (Test 1). A rejection of the null hypothesis is a rejection that the effect in the first electoral period is not greater than or equal to the effect in the second electoral period. From Table 6.5, the p-values of Test 1 indicate that it is not possible to reject the null hypothesis at the 10% level for the majority of the household groups, with the exception of HT5, HT6, HT11 and HT13 for the right-wing party and HT11 for the left-wing party.

The QMLE is a non-linear specification, so that the marginal estimates of the interaction terms estimated in Table 7.3 are calculated and shown between brackets for the right-wing party and the left-wing party respectively. It can be seen that, in the second electoral period, the marginal effect of a change in the PATR for the household group HT1 on the vote share of the right-wing party is smaller compared to in the first electoral period. In regard to the left-wing party, it is found that in the second electoral period, a one percentage point increase (and decrease) in the PATR for the household group HT6 (and HT7) enhances the vote share of the left-wing party by 2.14 (and 1.42) percentage points. Overall, the results in Table 7.3 suggest that the voters are rational in their voting decisions, so that the electoral manipulations lose credibility if the incumbent has been in power for consecutive electoral terms. Against this, it could be argued that the incumbents have been in office for an electoral term, and so are less likely to be popular for a second electoral term. As such, I believe that this is convincing evidence that the voters are able to learn about the incumbent's competence, so that this adds evidence to support the rational budget cycle. Further, it suggests that it does not hold for all elections since voters can overcome the asymmetric information, and there is the loss of credibility in the electoral manipulations in a second electoral term.

7.5 Conclusions

This chapter provides evidence on the credibility of electoral fiscal policies if an incumbent wins consecutive elections. This is for the EU26 member countries over the period from 1996 to 2016. Although there are 135 elections that took place in the EU26, the sample size is smaller since the focus is on the elections where an incumbent party wins consecutive elections, which in total is 63 elections, bearing in mind that on five occasions the same party is observed to win three consecutive elections, so that these are each two observations on a consecutive election. There are consecutive elections in 22 of the EU26 countries over this study period, with no consecutive elections in Italy, Latvia, Lithuania and Romania. Regressing the main equation with the smaller sample of 63 observations the findings are similar to Chapter 6, since the vote share of the left-wing party increases for many household groups following an election-year decrease in the PATRs. However, there is also some evidence that the vote share of the right-wing party increases as the PATRs decreases in the election-year for some household groups, for which there is no evidence in the main regressions of Chapter 6, but suggesting that in the consecutive elections the right-wing parties engage in this kind of behaviour.

Focusing on these consecutive elections, the chapter finds that when the incumbent government manipulates the PATRs in the first electoral period, there is evidence that its vote share also changes. More specifically, the vote share of the right and left-wing parties increases when the parties decrease the PATRs in the election year. Indeed, this kind of behaviour no doubt improves the incumbent's re-election chances, partly explaining its consecutive election wins. However, in the second electoral period the chapter finds that the effect of electoral manipulation on the tax rates is much smaller for both right- and left-wing parties compared to the first electoral period. It can indeed be seen from the p-values of Test 1 that, in the majority of the cases, the null hypothesis cannot be rejected, indicating that the effect in the first electoral period is bigger than or equal to the effect in the second electoral period. These results indicate that the electorate may learn from the previous electoral manipulations of the incumbent where there are consecutive elections, and that as such this behaviour loses credibility with the voters. It offers support for the notion that the electorate is rational, with voters basing their decision-making on the past economic performance over the entire electoral term, suggesting that they cannot be consistently fooled by these political manipulations of the economy, with implications for the political business cycle literature. The results add an important contribution to the literature since they are consistent with the electoral manipulations losing credibility if the incumbent government has been in office for consecutive terms.

Chapter 8. Conclusions

8.1 Introduction

The literature on political budget cycles examines how governments implement fiscal policies as one of the way to manipulate and influence voters' preferences in the run-up to an election. There is a large body of research analysing the impact of government spending, budget deficits and taxation on electoral cycles, but overall there is mixed evidence on the presence of the political budget cycle., i.e., cyclical fluctuations in fiscal policies associated with the pattern of elections. While many studies have considered the use of fiscal policies, such as government spending or budget deficits, the focus on taxation is more limited, with research focused on the total tax take as a share of GDP at the country level. However, taxation is an important fiscal instrument that anecdotally is used during election campaigns in many countries, while voters are likely to be more directly affected by taxation than by changes in government spending.

As such, the aim of this thesis is to enhance the existing literature by focusing on the net Personal Average Tax Rate (PATR), which is a form of effective income tax rate, measuring the tax burden that is borne by households. In fact, the PATR is available for thirteen different household groups, which is by marital status, family size and income. These household groups consist of single individuals with no children (HT1 to HT6), single individuals with two children (HT7), married couples with two children (HT8 to HT11) and married couples with no children (HT12 to HT13). Within these, the groups vary by levels of average earnings. Of the four sub-groups, the number of married couples with two children is the largest.

Panel data from the EU26 member countries over the 1996-2016 period is used in this thesis to examine the partisan electoral effect on the PATRs, that is, to investigate whether the incumbent government has a partisan opportunistic behaviour. This means that both the right- and left-wing parties engage in electoral PATRs cuts to influence voters on their sides and to possibly increase their re-election chances. Given that the PATRs are available for the thirteen household groups, a contribution is to identify which of these is targeted by governments.

A related strand of literature to the political budget cycle is electoral accountability that investigates whether the electoral manipulations in the fiscal policies are beneficial or not for the incumbent government. Electoral accountability implies that the incumbent engages in positive changes in the economy with the belief that it will be rewarded through an increase in its vote at the next election. Conversely, the government is penalised if it engages in adverse changes to the economy. With regard to electoral accountability and taxation, the majority of

the existing studies focus on 'yardstick competition', which is where voters compare the tax rates of their own jurisdiction to that of neighbouring ones, when deciding whether to reward or punish the incumbent. A drawback of yardstick competition is the focus on comparative voting, instead of the performance of the incumbent government in its own jurisdiction. There is, however, limited evidence on retrospective voting, whereby voters evaluate the performance of the government in a cross-country analysis. Consequently, this thesis also explores electoral accountability conditional on the government ideology. More specifically, one of the aims of the thesis is to examine whether election-year changes in the PATRs have an effect on the vote share of right- and left-wing incumbents. The chapter contributes to this literature by carrying out a cross-country analysis for the EU26 member countries, using PATRs.

An important issue with regard to electoral accountability is whether the manipulations of the fiscal instruments are credible, such that the incumbent government can keep on 'fooling' the voters. If the voters understand the electoral manipulations that are undertaken in an attempt to increase the incumbent's re-election chances then they may lose credibility. Conversely, if the voters are myopic and evaluate the government on its recent performance, then the voters may not understand the electoral manipulations and may be fooled. The issue of credibility is rarely explored in the literature, but a further contribution of this thesis is to examine this issue by focusing on the credibility of electoral manipulations in the PATRs for governments that are in office for consecutive terms. It investigates whether the incumbents lose credibility if they win consecutive elections and potentially engage in electoral manipulations of the PATRs.

8.2 Main Findings

8.2.1 *The Partisan Political Budget Cycle*

A contribution of this thesis is to examine the effect of elections on the PATR, conditional on the political complexion of the government, to examine if there are opportunistic partisan effects in the EU26 member countries in the opportunistic behaviour of governments. Usually, it is supposed that a right-wing party puts emphasis on tax cuts as compared to a left-wing party. In this thesis, it is expected that both the right- and left-wing parties will engage in the electoral decrease in the PATRs. This signifies that there is a partisan effect in an opportunistic behaviour, because while the left-wing is known for tax increases, in the run-up to an election it engages in tax cuts to influence voters onto its side to possibly increase its re-election chances. Since the PATR is available for thirteen household groups, the contribution of this chapter to

the literature of political budget cycles is to understand which of these groups are targeted by the incumbent.

Using the difference-GMM estimator, the main findings of Chapter 5 indicate that both right- and left-wing governments engage in electoral cuts of the PATRs. More precisely, there is evidence that the right-wing party decreases the PATR for the household group HT8, which is married couples with two children and 100% of average earnings for the principal earner. The left-wing party also engages in electoral PATR cuts for the household groups HT8 to HT11, which consist of married couples with two children but at different levels of average earnings. These findings indicate that all parties engage in opportunistic behaviour by decreasing the PATRs for some of the household groups in the run-up to an election.

The chapter also takes into account the timing of elections. Usually, elections take place at a constitutionally fixed term and these are considered as pre-determined elections. When the elections are pre-determined, the incumbent has time to engage in the electoral manipulations of the fiscal instruments as compared to when the elections are not pre-determined. Chapter 5 finds that when the election dates are pre-determined, there is significant evidence that the left-wing party engages in electoral tax cuts compared to the right-wing party. In particular, the left-wing party decreases the PATRs for the household groups of both single individuals (HT3 and HT6) and married couples (HT8 to HT11 and HT13). An implication is that, although the right-wing party engages in tax cuts, the electoral PATR cuts by the left-wing party are opportunistic behaviour as it is presumed to put more emphasis on government spending over tax cuts. Of the four sub-groups, the number of married couples with two children is the largest, and it can be seen that both right- and left-wing parties decrease the PATRs for this household group. This study, therefore, indicates that the incumbents have an understanding of which household groups to target to influence their vote.

8.2.2 *Income Tax Rates and Electoral Accountability*

Another contribution of the thesis is to investigate the effect of an election-year change in the PATR on the vote share of the incumbent government, conditional on the government ideology. Using the QMLE, the main findings of Chapter 6 suggest that the vote share of the government depends on the ideology. While there is no evidence that the vote share of the right-wing party is affected following an election-year change in the PATR, an election-year decrease in the PATRs for the household groups increase in the vote share of the left-wing party. This is across the EU26 member countries and for of both single individuals and married couples. Usually it is expected that a right-wing party puts more emphasis on taxation, so that it is expected that

the voters will reward the right-wing party for electoral decreases in the PATRs. Since the left-wing party typically focuses on government spending instead of tax cuts, it is expected that the voters will punish the left-wing party for tax cuts. However, the findings show that the voters actually reward the incumbent government for improvements in their economic situation.

Similar to Chapter 5, where I differentiate between the pre-determined and the not pre-determined elections, Chapter 6 also takes into account the timing of elections. In Chapter 5, there is evidence that, when the election is pre-determined, the left-wing party engages in PATR cuts in an attempt to increase their re-election chances. As part of the robustness tests in Chapter 6, a similar result is found as only the vote share of the left-wing party is affected by an election-year PATR change. This is for household groups of single individuals and married couples.

Further to these, the West EU and the CEECs are separately considered to explore their voting behaviour. The results show that in the West EU the voters behave as expected, that is, they reward the right-wing government for electoral PATR cuts, but the left-wing government is penalised for electoral PATR cuts. As such it can be said that the voters in the West EU understand the electoral reduction in taxes by the left-wing government as an opportunistic behaviour. However, in the CEECs, the signs on the coefficient estimates of the main variables of interest are counter-intuitive. Unlike the West EU, the vote share of the right-wing [left-wing] government increases as a result of an election-year increase [decrease] in the PATRs. This demonstrates that the voters in the CEECs are more likely to reward the incumbent if they adopt policies that are different to the government's ideology. It implies that the main findings for the cuts in the PATRs across the EU26 are influenced by voter behaviour in the CEECs.

8.2.3 *The Credibility of Electoral Manipulations*

Given that it is shown in Chapter 5 that incumbent governments have a partisan opportunistic behaviour and engage in the electoral manipulations of the PATRs, and that in Chapter 6 that incumbent governments are rewarded for electoral PATR cuts, the third aim of the thesis is to investigate the credibility of the electoral PATRs changes. More precisely, as a contribution to the literature on political budget cycles it investigates whether electoral manipulations in the tax rates are credible, so that an incumbent can 'fool' the electorate election after election. That is, if voters believe the electoral manipulations in the PATRs given that the incumbent has been in office for the previous electoral term. Voters are either myopic or rational in their decision-making process. If voters are myopic, then they take into account the recent performance of the incumbent government only, and as such the electorate is likely to reward the incumbent for electoral manipulations, so that these are considered as credible by the voters. If, however,

the voters are rational, then they will remember the past events, and not just focus on the recent performance of the incumbent government. Consequently, rational voters will understand the electoral manipulations and repeated electoral manipulations of the fiscal policies by the same incumbent will lose credibility.

To investigate this, only a subset of the EU26 elections over 1996-2016 are considered, and this is where an incumbent government has been in office for successive electoral terms. Out of the 135 general elections in our sample, only 63 are relevant for considering this. The findings of this chapter indicate that the voters are rational, since pre-electoral manipulations lose their power to influence the vote share of the incumbent in a second term where the same party or coalition wins consecutive elections. In some cases, however, the election-year change in the second electoral period has an effect on the vote share of the incumbent government, namely the left-wing party, but these effects are smaller than the effects in the first electoral period. Given these results, it can be said that the incumbent government loses credibility if it repeatedly engages in electoral manipulations of the fiscal policy, so that voters learn and are in this sense rational. As such, when a government is re-elected, it can be said that the electoral manipulations in the PATRs lose credibility if they are repeated across electoral terms.

8.3 Discussion and Future Work

8.3.1 *Discussion*

Following the seminal works of Nordhaus (1975) and Hibbs (1977), many studies have been carried out exploring whether elections lead to a macroeconomic cycle. These studies have two main strands: opportunistic and partisan electoral behaviour by incumbent governments. Under the opportunistic model, the government is concerned with being re-elected and engages in pre-election fiscal expansions, which is irrespective of its ideology. Under the partisan model, the incumbent engages in partisan behaviour and a well-performing economy will enhance its re-election chances. Over the years, the literature has shifted to the electoral manipulation of fiscal instruments rather than macroeconomic outcomes, known as the political budget cycle.

With regard to the research on political budget cycle, many studies focus on government expenditure such as the composition of government expenditure and budget deficits. Some studies, however, focus on the revenue side of government budget with focus on tax revenues. According to Ashworth and Heyndels (2002), taxation is considered as an attractive fiscal tool that is used for electoral campaigns. While tax cuts are observed in the pre-election and election years, increases in tax are postponed until after the election years (Foremny and Riedel, 2014).

Instead of using total tax collection, this thesis shows that the effective income tax rate, in this case, the net Personal Average Tax Rate (PATR), also plays an important part as a fiscal tool during elections. This thesis first shows that both right- and left-wing parties manipulate the PATR in the EU26 member countries to influence voters and increase the re-election chances. While it is known that the right-wing party tends to work for the high-income earners and the left-wing party for the low-income earners, this thesis shows that the left-wing party is likely to decrease the PATRs for some household groups, which can be classified as the high-income earners. These findings indicate that the left-wing party engages in opportunistic behaviour, which is unlike the right-wing party that is known for tax cuts. Thus, the findings suggest the importance of the timing of elections to the choice of policy instruments. Kneebone and McKenzie (2001) find that there is a decrease in revenue in the election year by the right-wing party. My findings are similar to this in that the right-wing party decreases the PATR.

Alongside the partisan electoral cycle, this thesis examines electoral accountability, i.e., whether the electoral changes in the PATR affect the vote share of the incumbent government. Across the EU26 member countries, the thesis establishes that election motivated fiscal policies increase the vote share of the left-wing party, while there is no evidence that the vote share of the right-wing party is affected as a result of an election-year change in the PATRs. According to Tillman and Park (2009), voters associate tax cuts with the right-wing party, but they believe that the left-wing party will increase taxes. Given this, the voters are more likely to reward the right-wing party for tax cuts than punish the left-wing party for tax increases. However, the results of this thesis indicate that the opportunistic behaviour of the left-wing party plays to its advantage. This is because, while the voters are expecting a tax increase by the left-wing party, the opposite is observed, and the voters reward the incumbent left-wing party.

On examining these effects between the West EU and CEECs (i.e. the older-established democracies and new EU member states), the thesis finds that voters reward the opportunistic behaviour of the left-wing party in the CEECs only, but that in the West EU it is statistically insignificant. Rather, in the West EU, it is observed that the vote share of the right-wing party increases as there is an electoral cut in the PATRs. Tavits and Letki (2009) argue that in the post-communist countries, left-wing parties are more likely to implement fiscal policies that are similar to that of the right-wing parties. Hence, this may be a possible explanation for the findings of this thesis, where the left-wing party is rewarded for electoral tax cuts.

A further finding of the thesis is that the electoral fiscal manipulations lose credibility if the incumbent government wins consecutive elections and engages in electoral manipulations of the PATRs. It can be seen from Chapter 7 that the effects of the election-year change in the PATRs on the vote share of the incumbent government in its second electoral term are smaller

than that in the first term. In terms of credibility, the weaker effects in the second electoral period imply that the voters learn from the electoral manipulations and reward or punish the incumbent government accordingly. This is consistent with rational voters, so that they assimilate into their voting the behaviour of the incumbent government in its first electoral term. Rogoff and Sibert (1988) and Aytac (2018) argue that voters are rational in their voting, but experience asymmetric information about the credibility of the performance of the incumbent government, but this suggests they are able to learn this information, so it is consistent with this kind of model.

8.3.2 *Limitations and Future Research*

A contribution of this thesis is the use of the net Personal Average Tax Rate (PATR) to capture the effective income tax rate of different household groups. Up until now, this dataset has not been used in the context of a panel dataset for the EU26 member countries. To conclude the thesis, I outline some limitations of the approach and offer some suggestions for future research that may depart from the findings of the thesis.

First or all, although the PATR data is available across the EU26 member countries over the 1996-2016 period, it would be valuable to have data on these before 1996. This is because the post-1996 period is considered as one where there was a decrease in the level of government intervention, and tax reduction was favourable as compared to the pre-1996 period. Given that this thesis finds that election-year changes in the tax have an effect on the vote share of the incumbent government, another interesting and related topic for future research in the EU26 countries is to investigate whether taxation plays an important role in election campaigns, and electoral promises.

Second, a limitation of the thesis relates to the different household groups that are used, since they are a hypothetical sample of households and they may not be wholly representative of the true population in each EU26 country. Further, despite the thirteen household groups being weighted by the number of households in each group, this was somewhat crude, as I was only able to find information on the number of households who are either single individuals with either no or two children and married couples with either no or two, but nothing on income. Moreover, the information on the number of households is available for period 2010-16 only. I acknowledge that this is a limitation, but nevertheless a reasonable attempt was made in the thesis to at least apply weights to the different household groups. In the future work, more consideration may be given to assigning more-detailed weights to the number of households.

Finally, while I have a good sample size, with observations on 134 elections across the EU26 member countries over 1996-2016, this is more limited in the analysis of credibility using consecutive elections in Chapter 7, for which just 63 elections are relevant. While this analysis is novel and a new way to assess the credibility of electoral manipulations of fiscal instruments and voter expectations, an examination for an extended time period would of course increase the number of observations. Nevertheless, it is hoped that this research will instigate a renewed interest in partisan electoral cycles and its effect on the electoral accountability of tax policy within the enlarged European Union, as well as on the credibility of electoral manipulations.

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Appendix: Text, Tables and Figures

Appendix Table 4.1: Summary of Variables

Variables	Description	Source
PATR: HT1 to HT13	Expressed as a % (Equation (4.1)) or as a fraction (Equation (4.2))	*Eurostat,* 2016
Overall PATR	Average of the PATR from the year after the previous election up to and including the current election year	*Eurostat,* 2016
PreElection PATR	Average of PATRs for the years after the previous election and excluding the current election year	*Eurostat,* 2016
Election PATR	Change between the PATR in the election year and the average for all the years of the PATR in the previous years	*Eurostat,* 2016
Election monthly	Change between the PATR in the year before current election and the average for all the years of the PATR in the previous years if election takes place in the first six months, and change between the PATR in the election year and the average for all the years of the PATR in the previous years if election takes place in the second half of the year	
VS^C	Vote Share of incumbent government in election year; expressed as a fraction	*IPU,* 2016
Previous vote	Previous Vote Share of incumbent government; expressed as a percentage	*IPU,* 2016
Election	*Election* = 1 in election years and 0 otherwise	World Bank's *Database of Political Institutions (DPI, 2016)* and *International Foundation for electoral Systems Election Guide (IFES,* 2016*)*

Election$_t$	x/12 in election year *t* and (12-x)/12 in the year *t-1* and 0 in the remaining years, where x denotes the month election is held	*DPI* (2016) and *IFES* (2016)
Election$_{t-1}$	x/12 in election year *t* and (12-x)/12 in the year *t-1* and 0 in the remaining years, where x denotes the month election is held	*DPI* (2016) and *IFES* (2016)
Election: Pre-Determined	*Election: Pre-Determined* = 1 if election date is pre-determined, and 0 otherwise	*IPU*, 2016
Election: Other	*Election: Other* = 1 if election date is not pre-determined, and 0 otherwise	*IPU*, 2016
Right-wing	*Right-wing* = 1 if right-wing party is in office, and 0 otherwise	*DPI*, 2016
Left-wing	*Left-wing* = 1 if left-wing party is in office, and 0 otherwise	*DPI*, 2016
Centre-of	*Centre-of* = 1 if centre-of party is in office, and 0 otherwise	*DPI*, 2016
Coalition	*Coalition* = 1 if cabinet consists of ministers from more than one party and 0 otherwise.	*Comparative Political Data Set (CPDS)*, 2016
GDP	Total GDP at constant prices, reference year 2010; expressed in billions of US dollars in Equation (4.1) and 1000 billions of US dollars in Equation (4.2)	*Eurostat*, 2016
GDP per capita	GDP per capita at constant prices, reference year 2010; expressed in thousands of US dollars in Equation (4.1) and in ten thousand of US dollars in Equation (4.2)	*Eurostat*, 2016 http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do

GDP growth	Growth rate of real GDP; expressed as a fraction	*Eurostat*, 2016
Inflation	Annual percentage change in the cost to the average consumer of acquiring a basket of goods and services; expressed as a fraction	*WDI*, 2016
Govt exp	Government expenditure (consists of social protection , health, general public services, education, economic affairs, public order and safety, defence, recreation, environmental protection and housing and community amenities) as a percentage of GDP; expressed as a fraction	*Eurostat*, 2016 http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=gov_10a_main&lang=en
Unemployment	Share of the labour force that is without work but available for and seeking employment; expressed as a fraction	*WDI*, 2016
Pop14	Population aged between 0 to 14 as a percentage of total population); expressed as a fraction	*WDI*, 2016
Pop64	Population aged 65 and above as a percentage of total population); expressed as a fraction	*WDI*, 2016
Illiteracy	Illiteracy rate among the population aged 15 years old and above; expressed as a fraction	*Barro and Lee* (2013)

Appendix Table 4.2: Descriptive Statistics

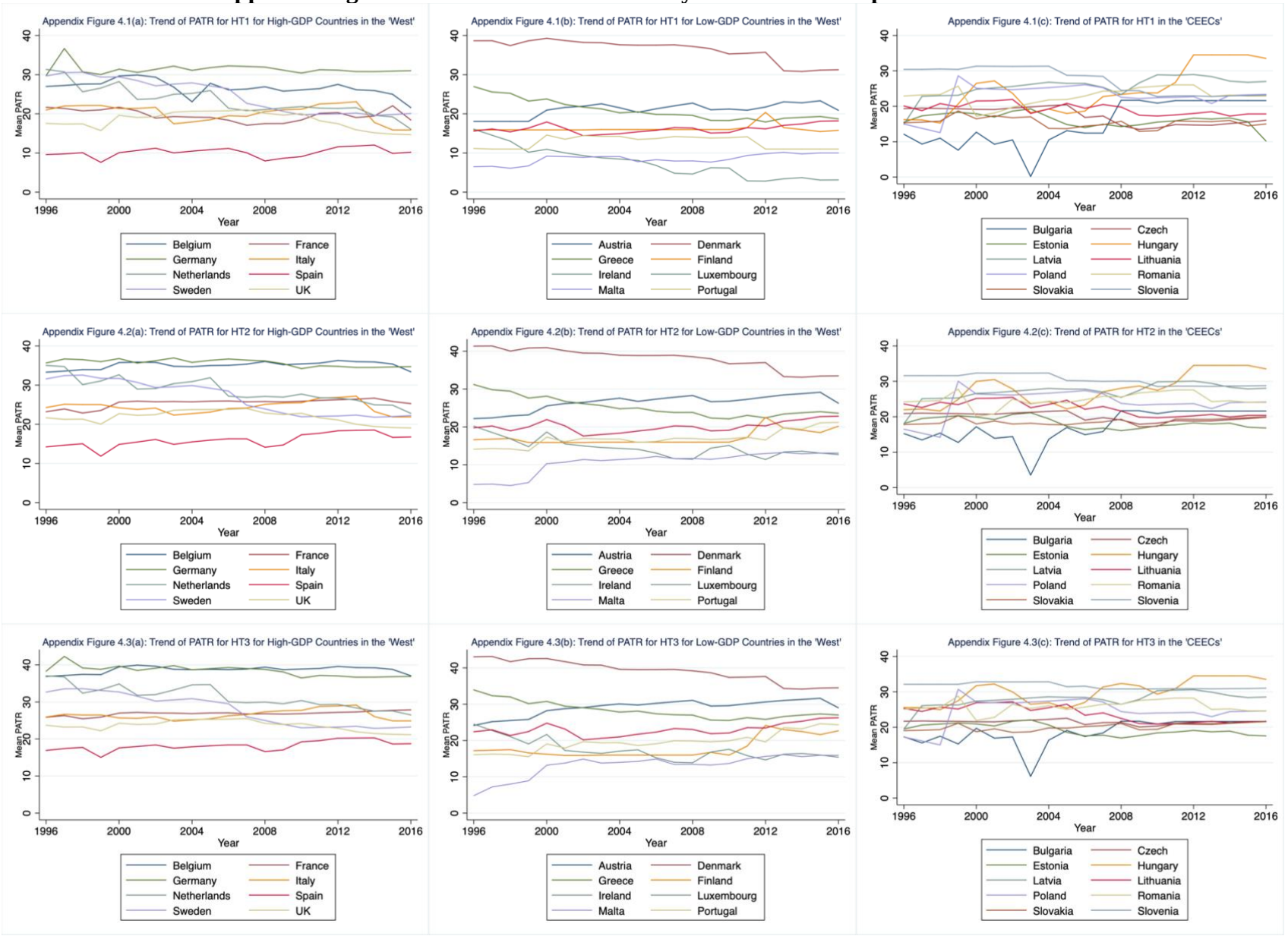
Variables	Count	Mean	Std. Deviation	Min	Max
PATR: HT1	546	19.99	7.236	0.150	39.26
PATR: HT2	546	23.59	7.054	3.520	41.39
PATR: HT3	546	25.47	7.086	4.800	43.17
PATR: HT4	546	27.74	7.146	8.830	44.95
PATR: HT5	546	30.15	7.483	11.37	48.37
PATR: HT6	546	32.97	8.015	14.36	52.58
PATR: HT7	546	4.513	10.99	-39.49	24.69
PATR: HT8	546	15.10	8.297	-8.600	31.11
PATR: HT9	546	17.75	7.057	0.600	36.48
PATR: HT10	546	20.89	6.943	5.620	39.6
PATR: HT11	546	23.63	6.773	0.460	41.68
PATR: HT12	546	24.30	6.886	9.300	41.39
PATR: HT13	546	27.74	7.061	12.93	44.95
Overall PATR: HT1	135	0.202	0.073	0.032	0.389
Overall PATR: HT2	135	0.237	0.071	0.047	0.409
Overall PATR: HT3	135	0.255	0.072	0.076	0.427
Overall PATR: HT4	135	0.277	0.072	0.105	0.444
Overall PATR: HT5	135	0.301	0.076	0.139	0.478
Overall PATR: HT6	135	0.329	0.081	0.186	0.517
Overall PATR: HT7	135	0.046	0.107	-0.338	0.229
Overall PATR: HT8	135	0.152	0.082	-0.063	0.306
Overall PATR: HT9	135	0.179	0.071	0.028	0.360
Overall PATR: HT10	135	0.2010	0.070	0.069	0.391
Overall PATR: HT11	135	0.237	0.068	0.094	0.411
Overall PATR: HT12	135	0.244	0.070	0.104	0.409
Overall PATR: HT13	135	0.277	0.071	0.166	0.444
PreElection PATR: HT1	135	0.203	0.073	0.033	0.390
PreElection PATR: HT2	135	0.237	0.072	0.049	0.414
PreElection PATR: HT3	135	0.256	0.073	0.072	0.431
PreElection PATR: HT4	135	0.277	0.073	0.100	0.449
PreElection PATR: HT5	135	0.301	0.077	0.133	0.484
PreElection PATR: HT6	135	0.329	0.082	0.180	0.524
PreElection PATR: HT7	135	0.048	0.108	-0.344	0.247
PreElection PATR: HT8	135	0.153	0.083	-0.075	0.311
PreElection PATR: HT9	135	0.180	0.072	0.017	0.365
PreElection PATR: HT10	135	0.210	0.071	0.066	0.396
PreElection PATR: HT11	135	0.238	0.068	0.113	0.416
PreElection PATR: HT12	135	0.244	0.071	0.099	0.414
PreElection PATR: HT13	135	0.277	0.072	0.160	0.449

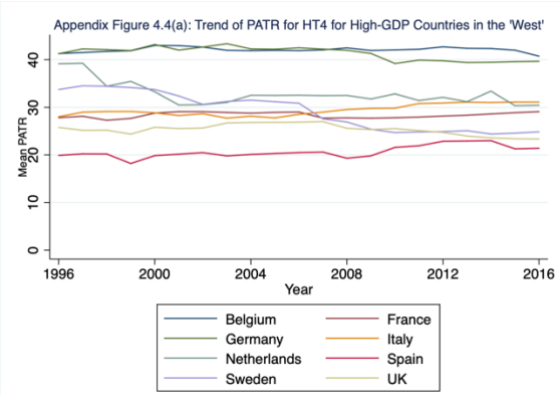
Election PATR: HT1	135	-0.000	0.017	-0.066	0.068
Election PATR: HT2	135	0.001	0.014	-0.052	0.047
Election PATR: HT3	135	0.001	0.014	-0.043	0.047
Election PATR: HT4	135	0.001	0.013	-0.035	0.051
Election PATR: HT5	135	0.001	0.013	-0.037	0.047
Election PATR: HT6	135	0.000	0.013	-0.043	0.046
Election PATR: HT7	135	-0.002	0.048	-0.273	0.113
Election PATR: HT8	135	0.001	0.025	-0.174	0.063
Election PATR: HT9	135	0.000	0.019	-0.065	0.055
Election PATR: HT10	135	0.000	0.016	-0.050	0.050
Election PATR: HT11	135	0.000	0.020	-0.134	0.055
Election PATR: HT12	135	0.001	0.0145	-0.050	0.063
Election PATR: HT13	135	0.001	0.014	-0.035	0.051
Election monthly: HT1	135	-0.000	0.018	-0.066	0.068
Election monthly: HT2	135	0.001	0.015	-0.052	0.050
Election monthly: HT3	135	0.000	0.014	-0.043	0.041
Election monthly: HT4	135	0.001	0.014	-0.039	0.068
Election monthly: HT5	135	0.000	0.014	-0.033	0.058
Election monthly: HT6	135	-0.000	0.014	-0.041	0.040
Election monthly: HT7	135	-0.002	0.048	-0.262	0.113
Election monthly: HT8	135	0.001	0.026	-0.174	0.079
Election monthly: HT9	135	-0.000	0.020	-0.065	0.070
Election monthly: HT10	135	-0.000	0.017	-0.052	0.067
Election monthly: HT11	135	-0.000	0.020	-0.134	0.073
Election monthly: HT12	135	0.000	0.016	-0.050	0.063
Election monthly: HT13	135	0.001	0.014	-0.039	0.068
VS^{C}	135	0.289	0.113	0.030	0.601
VS (log transformation)	135	-0.991	0.665	-3.490	0.410
Previous vote	135	-34.07	9.278	14.30	58.63
Previous vote (Equation (4.3))	135	0.341	0.093	0.143	0.587
Election	546	0.262	0.440	0	1
Election: Pre-Determined	546	0.192	0.394	0	1
Election: Other	546	0.070	0.255	0	1
Right-wing	546	0.352	0.478	0	1
Left-wing	546	0.364	0.482	0	1
Centre-of	546	0.284	0.451	0	1
Coalition	546	0.826	0.379	0	1
GDP	546	616.2	897.8	5.772	3781.7
*GDP**	135	0.057	0.084	0.001	0.352
ln *GDP*	546	5.346	1.602	1.753	8.238
ln *GDP**	135	-3.881	1.553	-7.381	-1.043
GDP per capita	546	31.01	20.76	3.801	111.97
*GDP per capita**	135	2.971	1.966	0.385	10.58

ln *GDP per capita*	546	3.195	0.735	1.335	4.718
ln *GDP per capita**	135	0.851	0.736	-0.073	0.098
GDP growth	546	0.026	0.035	-0.148	0.256
*GDP growth**	135	0.026	0.027	-0.073	0.098
Inflation	546	0.058	0.462	-0.045	10.58
*Inflation**	135	-3.666	0.510	-0.014	5.810
ln *Inflat*ion	504	-3.845	1.746	-33.40	2.359
ln *Inflat*ion*	132	-3.666	0.985	-6.727	1.775
*Unemployment**	135	0.092	0.428	0.027	0.263
Govt exp	546	0.445	0.066	0.280	0.653
*Govt exp **	135	0.450	0.063	0.330	0.594
Pop14	546	16.62	2.010	12.85	23.57
Pop64	546	0.161	0.024	0.105	0.227
*Illiteracy**	135	0.030	0.034	0	0.187

Note: * denotes the average of the variable during the term in office as used in Equation (4.2).

Appendix Figures 4.1 – 4.13: Mean PATRs by Household Group for EU26 Countries 1996-2016




Appendix Figure 4.4(a): Trend of PATR for HT4 for High-GDP Countries in the 'West'
Mean PATR
0
10
20
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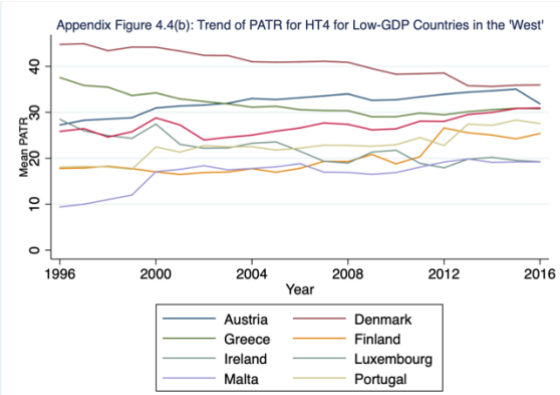
1996
2000
2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.4(b): Trend of PATR for HT4 for Low-GDP Countries in the 'West'
Mean PATR
0
10
20
30
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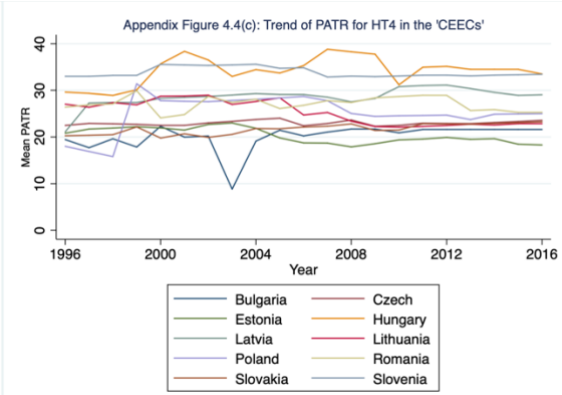
1996
2000
2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.4(c): Trend of PATR for HT4 in the 'CEECs'
Mean PATR
0
10
20
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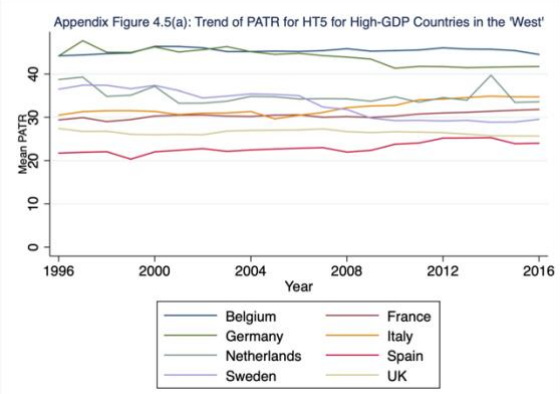
1996
2000
2004
2008
2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia


Appendix Figure 4.5(a): Trend of PATR for HT5 for High-GDP Countries in the 'West'
Mean PATR
0
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20
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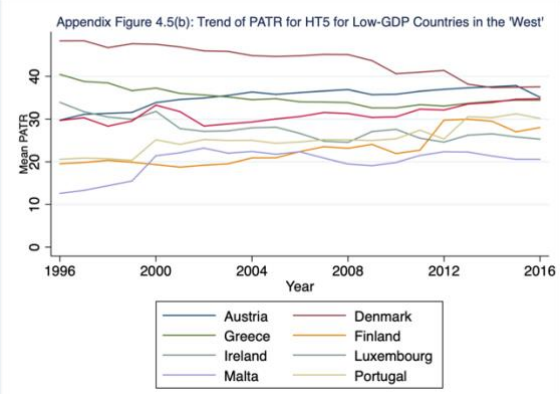
1996
2000
2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.5(b): Trend of PATR for HT5 for Low-GDP Countries in the 'West'
Mean PATR
0
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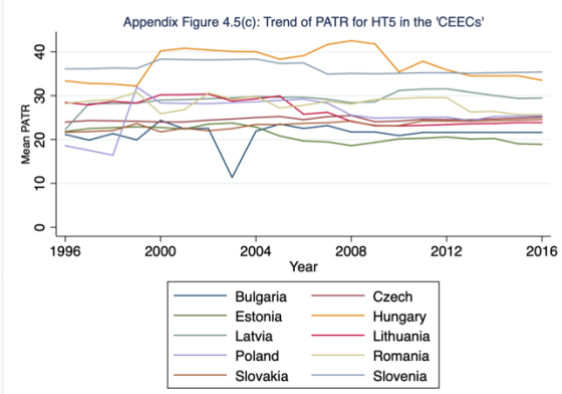
1996
2000
2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.5(c): Trend of PATR for HT5 in the 'CEECs'
Mean PATR
0
10
20
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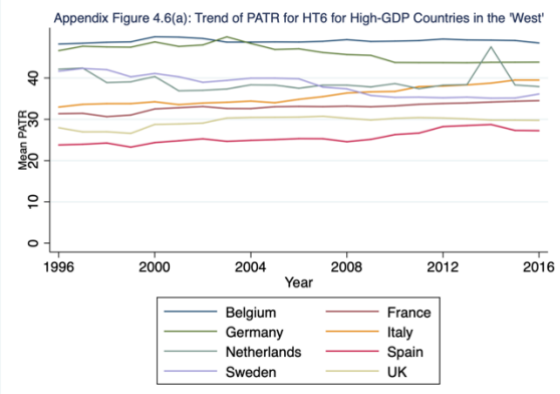
1996
2000
2004
2008
2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia


Appendix Figure 4.6(a): Trend of PATR for HT6 for High-GDP Countries in the 'West'
Mean PATR
0
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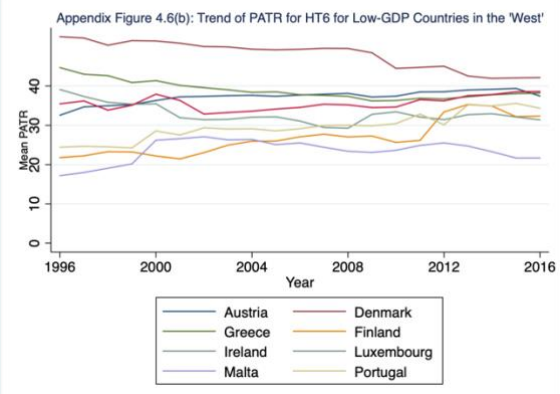
1996
2000
2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.6(b): Trend of PATR for HT6 for Low-GDP Countries in the 'West'
Mean PATR
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1996
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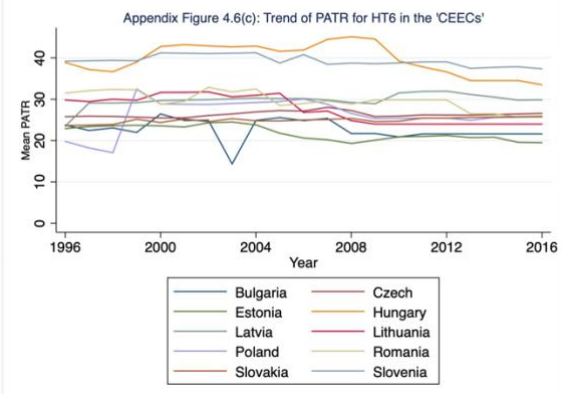
2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.6(c): Trend of PATR for HT6 in the 'CEECs'
Mean PATR
0
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1996
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2004
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2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
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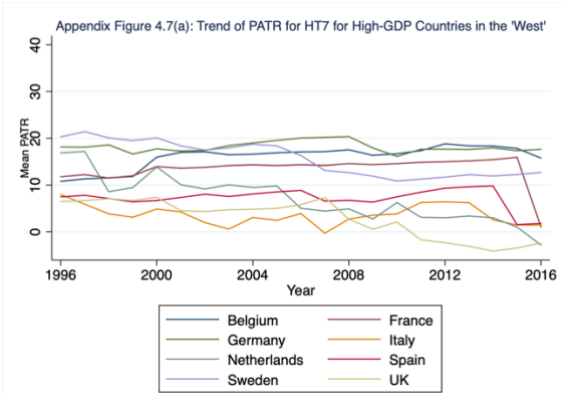
Slovenia


Appendix Figure 4.7(a): Trend of PATR for HT7 for High-GDP Countries in the 'West'
Mean PATR
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1996
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2004
2008
2012
2016
Year
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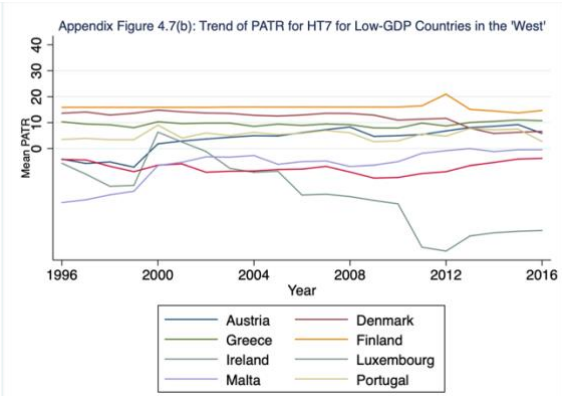
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.7(b): Trend of PATR for HT7 for Low-GDP Countries in the 'West'
Mean PATR
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1996
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2012
2016
Year
Austria
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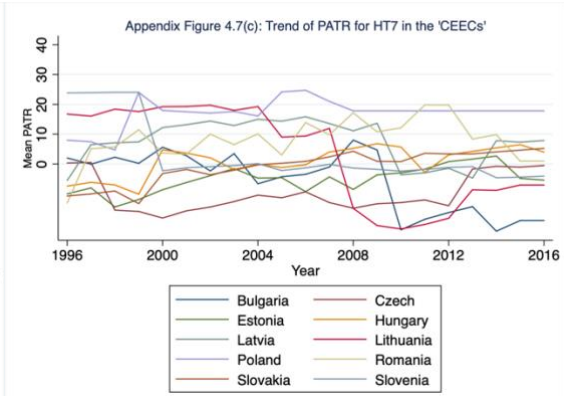
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.7(c): Trend of PATR for HT7 in the 'CEECs'
Mean PATR
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1996
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Year
Bulgaria
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Estonia
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Lithuania
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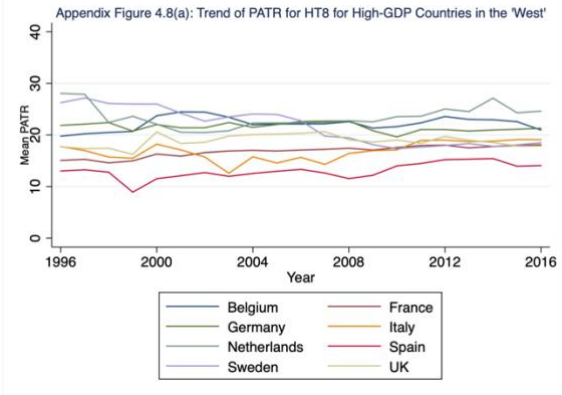
Appendix Figure 4.8(a): Trend of PATR for HT8 for High-GDP Countries in the 'West'
Mean PATR
0
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1996
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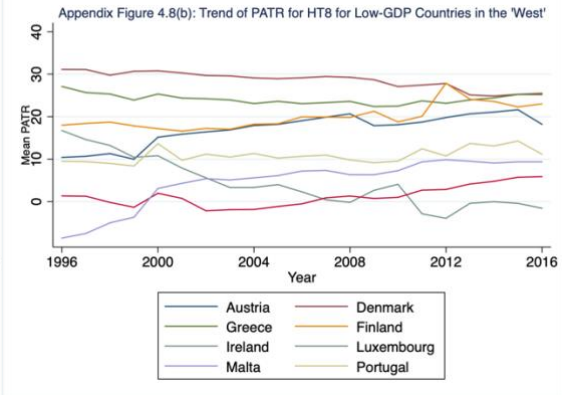
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.8(b): Trend of PATR for HT8 for Low-GDP Countries in the 'West'
Mean PATR
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1996
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Denmark
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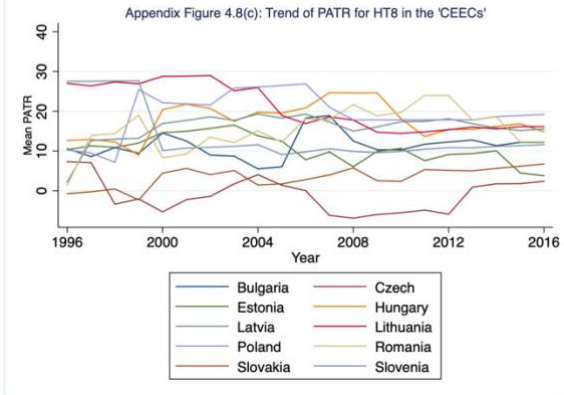
Luxembourg
Malta
Portugal


Appendix Figure 4.8(c): Trend of PATR for HT8 in the 'CEECs'
Mean PATR
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1996
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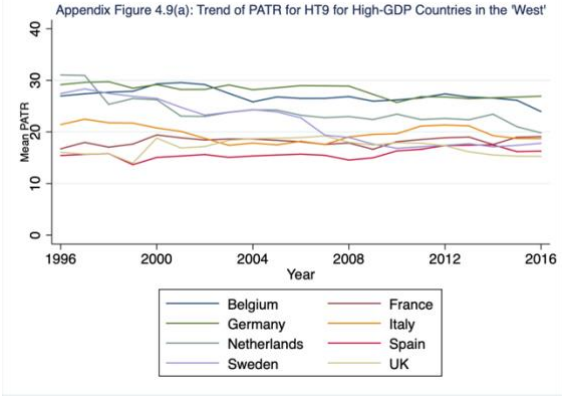
Appendix Figure 4.9(a): Trend of PATR for HT9 for High-GDP Countries in the 'West'
Mean PATR
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1996
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Belgium
France
Germany
Italy
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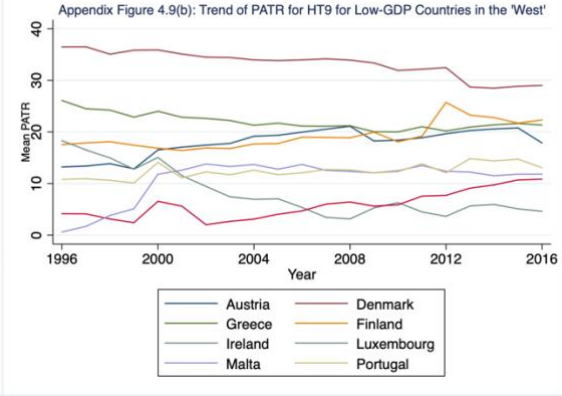
Spain
Sweden
UK


Appendix Figure 4.9(b): Trend of PATR for HT9 for Low-GDP Countries in the 'West'
Mean PATR
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1996
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Year
Austria
Denmark
Greece
Finland
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Luxembourg
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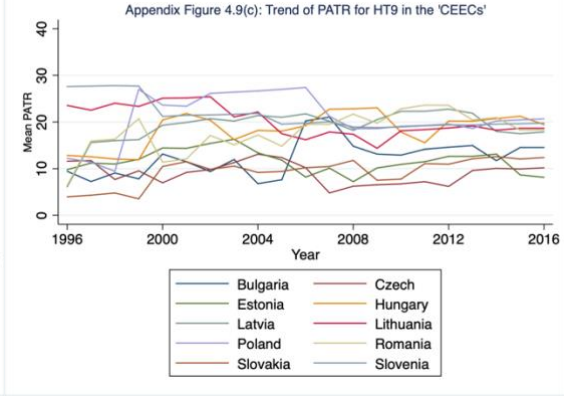
Appendix Figure 4.9(c): Trend of PATR for HT9 in the 'CEECs'
Mean PATR
0
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1996
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2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
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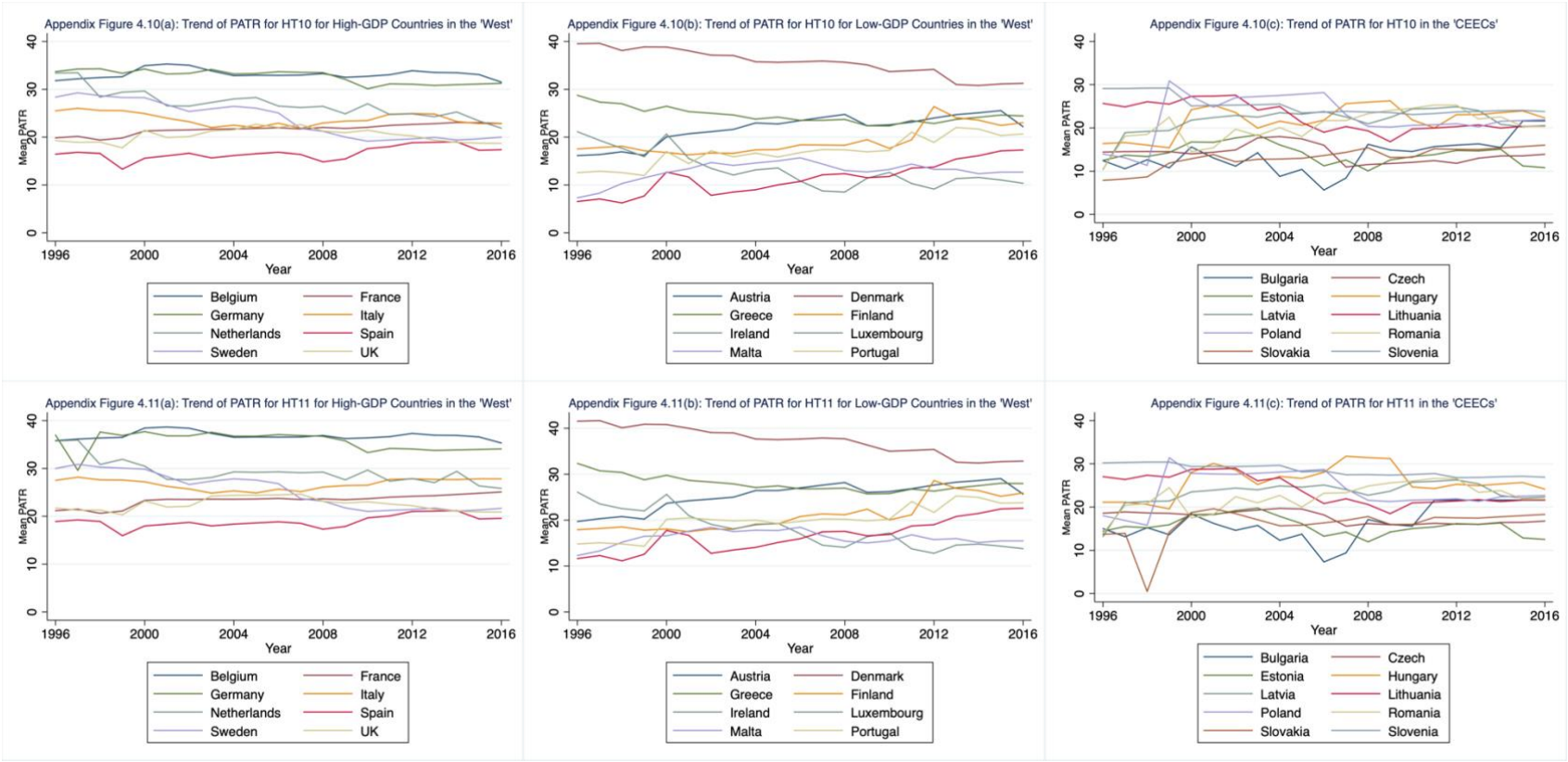
Slovenia


Appendix Figure 4.10(a): Trend of PATR for HT10 for High-GDP Countries in the 'West'
Mean PATR
0
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1996
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2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK
Appendix Figure 4.10(b): Trend of PATR for HT10 for Low-GDP Countries in the 'West'
Mean PATR
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1996
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2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal
Appendix Figure 4.10(c): Trend of PATR for HT10 in the 'CEECs'
Mean PATR
0
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20
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1996
2000
2004
2008
2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia
Appendix Figure 4.11(a): Trend of PATR for HT11 for High-GDP Countries in the 'West'
Mean PATR
0
10
20
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1996
2000
2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK
Appendix Figure 4.11(b): Trend of PATR for HT11 for Low-GDP Countries in the 'West'
Mean PATR
0
10
20
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1996
2000
2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal
Appendix Figure 4.11(c): Trend of PATR for HT11 in the 'CEECs'
Mean PATR
0
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1996
2000
2004
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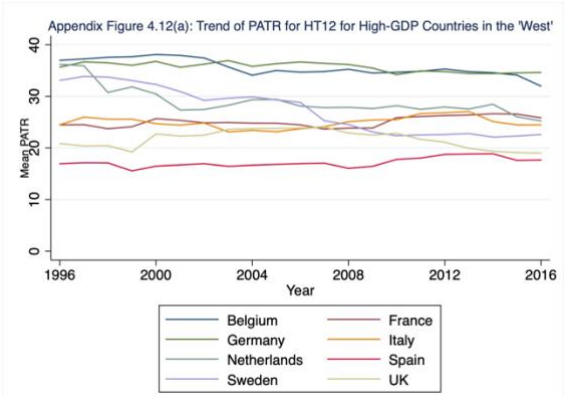
2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia


Appendix Figure 4.12(a): Trend of PATR for HT12 for High-GDP Countries in the 'West'
Mean PATR
0
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2016
Year
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France
Germany
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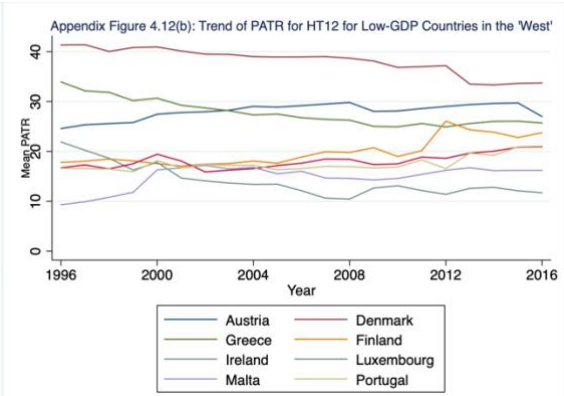
Netherlands
Spain
Sweden
UK


Appendix Figure 4.12(b): Trend of PATR for HT12 for Low-GDP Countries in the 'West'
Mean PATR
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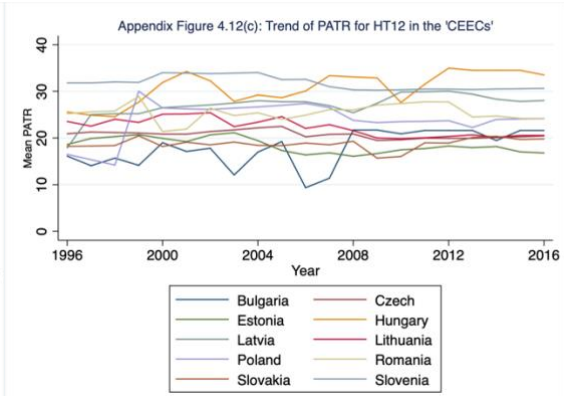
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.12(c): Trend of PATR for HT12 in the 'CEECs'
Mean PATR
0
10
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1996
2000
2004
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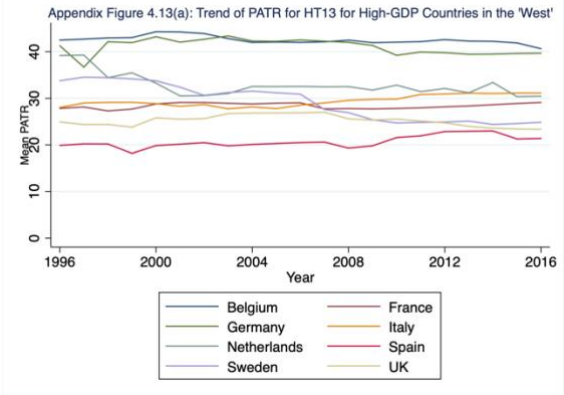
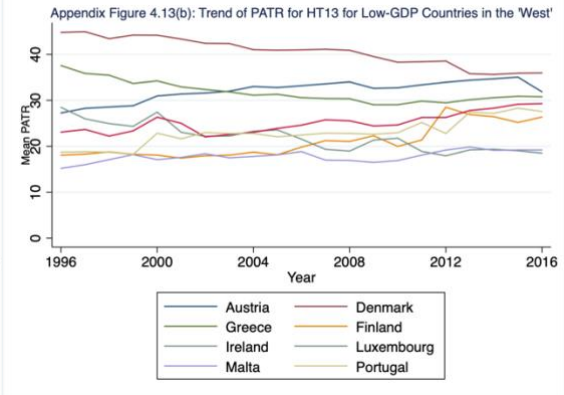
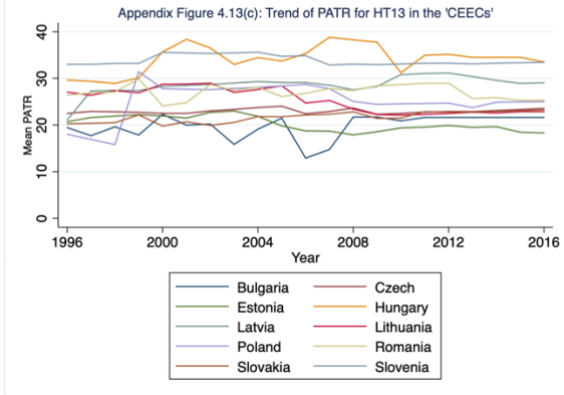
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia


Appendix Figure 4.13(a): Trend of PATR for HT13 for High-GDP Countries in the 'West'
Mean PATR
0
10
20
30
40
1996
2000
2004
2008
2012
2016
Year
Belgium
France
Germany
Italy
Netherlands
Spain
Sweden
UK


Appendix Figure 4.13(b): Trend of PATR for HT13 for Low-GDP Countries in the 'West'
Mean PATR
0
10
20
30
40
1996
2000
2004
2008
2012
2016
Year
Austria
Denmark
Greece
Finland
Ireland
Luxembourg
Malta
Portugal


Appendix Figure 4.13(c): Trend of PATR for HT13 in the 'CEECs'
Mean PATR
0
10
20
30
40
1996
2000
2004
2008
2012
2016
Year
Bulgaria
Czech
Estonia
Hungary
Latvia
Lithuania
Poland
Romania
Slovakia
Slovenia

Appendix 5.1: Counter-intuitive Signs on GDP and GDP per capita

In Chapter 5, it can be seen that the coefficient estimates of the variables GDP and GDP per capita are counter-intuitive, that is, when the coefficient estimates of GDP are positive, then that of GDP per capita are negative. The following equations can be used to possibly explain the counter-intuitive signs on the coefficient estimates:

$$(a+b)\ln GDP - b\ln\left(\frac{GDP}{Population}\right). \quad (5.1)$$

Through the logarithmic properties, (5.1) can be written as:

$$(a+b)\ln GDP - b\ (\ln GDP - \ln Population), \quad (5.2)$$

which simplifies to:

$$a\ \ln GDP + b\ln Population. \quad (5.3)$$

Since *GDP* and *Population* capture the country size, the coefficients of *GDP* (a) and *Population* (b) are positive in Equation (5.3). As such, this confirms that the coefficients in Equation (5.1) are counter-intuitive, that is, the coefficient of *GDP* can be positive, while the coefficient of *GDP per capita* is negative, and vice versa.

Appendix Table 5.1: Difference-GMM Estimates for Model including Demographic Variables

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.330*	-0.185	-0.168	-0.127	-0.0911	-0.0486	-0.191	-0.202	-0.110	-0.115	-0.124	-0.0728	-0.0261
	(0.200)	(0.131)	(0.123)	(0.124)	(0.103)	(0.0817)	(0.352)	(0.184)	(0.136)	(0.130)	(0.155)	(0.135)	(0.119)
Coalition	0.480	0.526	0.478	0.713*	0.714	0.654	0.451	0.327	0.510	0.401	0.570	0.816**	0.786*
	(0.386)	(0.347)	(0.312)	(0.404)	(0.438)	(0.419)	(0.491)	(0.550)	(0.447)	(0.413)	(0.475)	(0.370)	(0.438)
Lagged PATR	1.024***	0.905***	0.841***	0.789***	0.724***	0.638***	0.816***	0.669***	0.651***	0.756***	0.570***	0.888***	0.761***
	(0.150)	(0.140)	(0.149)	(0.135)	(0.146)	(0.157)	(0.143)	(0.0952)	(0.117)	(0.155)	(0.177)	(0.158)	(0.178)
Control Variables:													
Pop14	-0.096	-0.034	-0.029	-0.019	0.001	0.024	0.154	0.182	0.032	0.051	-0.020	0.029	0.011
	(0.136)	(0.091)	(0.088)	(0.089)	(0.096)	(0.125)	(0.268)	(0.188)	(0.157)	(0.114)	(0.133)	(0.100)	(0.094)
Pop64	-0.112	-0.017	-0.016	-0.001	0.004	-0.024	-0.303	-0.086	-0.153	-0.010	-0.039	0.032	0.022
	(0.138)	(0.054)	(0.045)	(0.046)	(0.049)	(0.064)	(0.305)	(0.118)	(0.113)	(0.079)	(0.094)	(0.068)	(0.057)
No. of obs.	494	494	494	494	494	494	494	494	494	494	494	494	494
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	6	6	6	6	6	6	6	6	6	6	6	6	6
AR (1) p-value	0.014	0.014	0.030	0.017	0.021	0.041	0.001	0.002	0.003	0.009	0.012	0.021	0.019
AR (2) p-value	0.545	0.647	0.519	0.210	0.199	0.167	0.435	0.251	0.958	0.533	0.636	0.349	0.932
Hansen p-value	0.390	0.403	0.209	0.440	0.237	0.301	0.321	0.666	0.188	0.308	0.992	0.116	0.839

Notes: *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election dummy and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 5.2: Difference-GMM Estimates for Model including Economic Variables

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.364*	-0.171	0.016	-0.076	-0.054	-0.047	-0.091	-0.189	-0.131	0.002	-0.028	-0.020	0.020
	(0.193)	(0.185)	(0.580)	(0.125)	(0.133)	(0.100)	(0.478)	(0.193)	(0.144)	(0.139)	(0.142)	(0.133)	(0.101)
Coalition	0.421	0.653	0.423	0.776	0.772	0.836	0.605	0.637	0.811	0.283	0.586	0.783	0.689
	(0.454)	(0.589)	(0.484)	(0.621)	(0.688)	(0.576)	(0.462)	(0.737)	(0.762)	(0.661)	(0.717)	(0.539)	(0.636)
Lagged PATR	0.899**	0.858	-0.198	0.544***	0.406	0.738**	0.887***	0.586***	0.717	0.110	0.042	0.541	0.107
	(0.357)	(0.973)	(3.174)	(0.201)	(0.368)	(0.311)	(0.187)	(0.212)	(0.511)	(0.567)	(0.163)	(0.524)	(0.327)
Control Variables:													
ln *GDP*	-10.60	-1.852	-3.559	6.587	8.578	13.09**	-13.22	-0.575	2.865	-11.99	-5.766	-3.568	-2.651
	(8.988)	(8.506)	(18.53)	(6.429)	(9.255)	(5.897)	(22.23)	(7.561)	(14.03)	(10.06)	(12.09)	(6.378)	(9.701)
ln *GDP per capita*	8.900	0.321	1.336	-9.061	-11.23	-15.60**	9.638	-3.390	-5.621	10.05	3.891	1.381	0.612
	(8.961)	(8.438)	(18.30)	(6.462)	(9.716)	(6.622)	(20.75)	(7.289)	(13.78)	(9.947)	(11.90)	(6.313)	(9.417)
GDP growth	-3.939	-5.214	-1.641	-3.165	-2.825	-4.720	-8.056	-5.734	-8.515	-3.405	-0.648	0.959	0.897
	(4.781)	(5.212)	(16.03)	(3.556)	(5.764)	(3.826)	(8.457)	(4.651)	(5.987)	(4.033)	(2.440)	(4.089)	(2.610)
ln *Inflation*	-0.091	-0.082	-0.028	-0.085	-0.088	-0.085	0.343	0.024	0.025	0.021	-0.015	-0.060	-0.033
	(0.105)	(0.108)	(0.215)	(0.060)	(0.094)	(0.071)	(0.227)	(0.076)	(0.091)	(0.057)	(0.058)	(0.052)	(0.057)
Govt exp	4.171	1.287	-2.538	-2.885	-3.146	-1.120	-6.179	-2.507	1.850	0.139	-1.172	3.141	-1.194
	(5.137)	(6.007)	(4.786)	(3.782)	(6.588)	(4.394)	(11.55)	(6.809)	(6.634)	(3.181)	(3.715)	(2.910)	(2.221)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	9	9	9	9	9	9	9	9	9	9	9	9	9
AR (1) p-value	0.045	0.321	0.999	0.002	0.235	0.018	0.000	0.021	0.163	0.636	0.381	0.291	0.488
AR (2) p-value	0.494	0.825	0.844	0.165	0.516	0.044	0.517	0.278	0.910	0.554	0.000	0.324	0.308
Hansen p-value	0.457	0.496	0.128	0.269	0.138	0.525	0.384	0.572	0.220	0.160	0.324	0.095	0.463

Notes: *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election dummy and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 5.3: Difference-GMM Estimates for Model including Economic Variables excluding Government Expenditure

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.336*	-0.163	0.041	-0.084	-0.053	-0.046	-0.109	-0.199	-0.131	0.005	-0.028	-0.005	0.019
	(0.195)	(0.174)	(0.681)	(0.125)	(0.183)	(0.010)	(0.478)	(0.195)	(0.155)	(0.139)	(0.140)	(0.134)	(0.010)
Coalition	0.415	0.636	0.418	0.803	0.777	0.849	0.602	0.638	0.802	0.286	0.610	0.777	0.704
	(0.447)	(0.560)	(0.462)	(0.615)	(0.771)	(0.576)	(0.467)	(0.736)	(0.762)	(0.642)	(0.722)	(0.551)	(0.636)
Lagged PATR	0.855**	0.797	-0.357	0.547***	0.297	0.823***	0.900***	0.604***	0.712	0.096	0.054	0.492	0.102
	(0.334)	(0.714)	(4.084)	(0.210)	(1.729)	(0.286)	(0.179)	(0.217)	(0.543)	(0.553)	(0.219)	(0.557)	(0.345)
Control Variables:													
ln *GDP*	-10.89	-2.210	-4.607	6.515	8.146	13.21**	-14.17	-0.383	3.064	-12.36	-5.844	-3.809	-2.577
	(8.087)	(6.075)	(26.70)	(6.172)	(11.86)	(5.132)	(22.60)	(7.513)	(15.18)	(10.36)	(11.77)	(6.463)	(9.673)
ln *GDP per capita*	8.779	0.586	2.717	-8.613	-10.43	-15.51***	11.36	-3.278	-5.986	10.49	4.147	1.314	0.738
	(8.285)	(6.314)	(26.96)	(6.144)	(12.05)	(5.596)	(21.35)	(7.346)	(14.78)	(10.46)	(11.66)	(6.562)	(9.359)
GDP growth	-4.460	-5.365	-0.374	-2.880	-2.081	-4.888*	-7.381	-5.641	-8.930	-3.418	-0.564	0.588	1.083
	(4.457)	(4.937)	(21.01)	(3.288)	(10.24)	(2.754)	(9.120)	(4.389)	(5.953)	(4.010)	(2.125)	(4.237)	(2.599)
ln *Inflation*	-0.107	-0.082	-0.003	-0.068	-0.069	-0.075	0.374	0.038	0.019	0.024	-0.010	-0.068	-0.028
	(0.103)	(0.105)	(0.285)	(0.052)	(0.071)	(0.061)	(0.240)	(0.080)	(0.095)	(0.064)	(0.058)	(0.055)	(0.053)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	8	8	8	8	8	8	8	8	8	8	8	8	8
AR (1) p-value	0.053	0.234	0.970	0.007	0.781	0.000	0.000	0.022	0.193	0.647	0.435	0.366	0.510
AR (2) p-value	0.521	0.838	0.848	0.192	0.894	0.004	0.486	0.256	0.902	0.523	0.009	0.311	0.316
Hansen p-value	0.415	0.454	0.123	0.320	0.165	0.535	0.383	0.600	0.211	0.161	0.331	0.085	0.488

Notes: *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election dummy and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 5.4: Difference-GMM Estimates for Specification including Year Fixed Effects

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	0.243	-0.167	0.096	-0.074	-0.039	0.001	0.122	-0.052	-0.169	-0.024	-0.020	-0.250	0.034
	(0.445)	(0.171)	(0.188)	(0.134)	(0.120)	(0.097)	(0.495)	(0.252)	(0.155)	(0.131)	(0.224)	(0.214)	(0.161)
Coalition	0.323	0.534	0.627	0.791	0.787	0.721	-0.060	0.464	0.864	0.625	0.713	1.204**	0.884
	(0.411)	(0.458)	(0.446)	(0.555)	(0.578)	(0.553)	(0.897)	(0.835)	(0.705)	(0.585)	(0.652)	(0.577)	(0.590)
Lagged PATR	-1.212	0.746	-1.001	0.462	0.671	0.338	0.0397	0.000248	0.714**	0.460	-0.228	1.598*	0.355
	(1.701)	(0.569)	(1.120)	(0.458)	(0.782)	(0.464)	(0.627)	(0.690)	(0.332)	(0.482)	(0.642)	(0.821)	(0.671)
Control Variables:													
ln *GDP*	0	0	0.398	0	0	0	35.91	0	0	0	0	0	0
	(0)	(0)	(2.664)	(0)	(0)	(0)	(33.42)	(0)	(0)	(0)	(0)	(0)	(0)
ln *GDP per capita*	0	0	0	-6.177*	0	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(3.251)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
GDP growth	0	-10.38	0	0	-10.11	-8.129	0	-11.22	-15.73**	-12.45	-6.883	-15.26	-7.849
	(0)	(6.805)	(0)	(0)	(6.620)	(5.595)	(0)	(9.822)	(6.726)	(7.880)	(8.077)	(11.16)	(8.894)
ln *Inflation*	0.213	-0.098	-0.023	-0.092	-0.126	-0.106	-0.110	-0.173	0.001	0.040	-0.004	-0.080	-0.068
	(0.212)	(0.095)	(0.091)	(0.084)	(0.108)	(0.110)	(0.424)	(0.217)	(0.257)	(0.169)	(0.122)	(0.102)	(0.087)
Govt exp	1.984	0	0	0	-3.097	0	0	0	-0.813	0	5.050	0	0
	(7.653)	(0)	(0)	(0)	(5.328)	(0)	(0)	(0)	(9.571)	(0)	(7.481)	(0)	(0)
Pop14	-4.010	0.005	-2.348*	-0.433	0.266	0.123	-1.978*	-0.571	0.580	-0.233	-0.790	0.468	-0.106
	(2.694)	(0.409)	(1.424)	(0.483)	(0.775)	(0.250)	(1.022)	(0.715)	(0.825)	(0.425)	(0.512)	(0.348)	(0.303)
Pop64	-1.529	-0.003	0.128	0.114	0.285	0.281	9.824	2.436	0.695	0.251	0.429	-0.806	0.229
	(1.564)	(0.489)	(0.583)	(0.427)	(0.215)	(0.375)	(7.653)	(1.974)	(2.073)	(0.493)	(0.458)	(0.775)	(0.524)
No. of obs.	449	449	449	449	449	449	449	449	449	449	449	449	449
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	30	30	30	30	30	30	30	30	30	30	30	30	30
AR (1) p-value	0.506	0.099	0.489	0.148	0.230	0.260	0.926	0.870	0.030	0.228	1.000	0.094	0.468
AR (2) p-value	0.640	0.475	0.463	0.269	0.307	0.375	0.058	0.722	0.815	0.582	0.504	0.467	0.698

Notes: *Election* is measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election dummy and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. Year fixed effects included. The reference country is Luxembourg.

Appendix Table 5.5: System-GMM Estimator for the Thirteen Household Groups

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	-0.310*	-0.115	-0.150	-0.092	-0.092	-0.036	-0.099	-0.204	-0.111	-0.008	-0.073	-0.004	0.036
	(0.178)	(0.149)	(0.146)	(0.139)	(0.134)	(0.111)	(0.518)	(0.197)	(0.144)	(0.158)	(0.214)	(0.142)	(0.190)
Coalition	0.381	0.865*	0.755*	0.922*	0.949	0.738	0.611	0.676	0.861	0.734	1.096	0.943	0.959
	(0.403)	(0.500)	(0.431)	(0.555)	(0.611)	(0.564)	(0.713)	(0.740)	(0.596)	(0.649)	(0.745)	(0.598)	(0.830)
Lagged PATR	0.772***	0.909***	0.783***	0.676***	0.751***	0.650**	0.833***	0.661***	0.723***	0.830***	0.524	0.699**	0.573
	(0.173)	(0.208)	(0.212)	(0.195)	(0.266)	(0.253)	(0.174)	(0.156)	(0.149)	(0.197)	(0.399)	(0.272)	(0.472)
Control Variables:													
ln *GDP*	-10.97*	1.920	2.381	6.985*	10.16*	2.957	-4.274	-0.705	3.869	3.316	7.402	2.579	4.970
	(6.340)	(1.734)	(2.562)	(4.050)	(5.541)	(5.848)	(60.85)	(6.692)	(4.911)	(12.47)	(6.494)	(2.929)	(5.255)
ln *GDP per capita*	9.286	-2.083	-4.815	-11.22**	-14.08**	-5.113	1.746	-3.819	-6.780	-3.607	-8.954	-3.509	-6.458
	(5.956)	(2.975)	(3.317)	(4.599)	(6.047)	(8.216)	(46.08)	(4.791)	(5.068)	(13.50)	(9.454)	(3.507)	(7.038)
GDP growth	-3.225	-5.106	-5.937	-3.281	-4.752	-2.231	-6.953	-5.443	-7.188	-5.806	-0.347	2.643	4.261
	(4.415)	(5.288)	(4.858)	(4.500)	(4.751)	(3.496)	(8.582)	(4.664)	(4.932)	(6.628)	(5.798)	(5.240)	(7.929)
ln *Inflation*	-0.084	-0.092	-0.103	-0.083	-0.097	-0.011	0.299	0.044	0.029	-0.007	-0.048	-0.067	-0.047
	(0.086)	(0.085)	(0.080)	(0.063)	(0.074)	(0.060)	(0.263)	(0.090)	(0.105)	(0.101)	(0.089)	(0.071)	(0.076)
Govt exp	4.122	3.457	-0.307	-3.232	-3.720	2.083	-9.340	-1.025	4.074	4.733	0.974	7.099*	5.387
	(4.055)	(4.567)	(5.009)	(4.168)	(4.374)	(4.781)	(10.51)	(8.232)	(7.015)	(6.839)	(5.068)	(3.678)	(3.962)
Pop14	-0.228	0.006	-0.127	-0.336**	-0.234	-0.076	-0.401	-0.140	-0.177	0.046	-0.175	0.008	-0.112
	(0.174)	(0.150)	(0.184)	(0.160)	(0.173)	(0.282)	(1.314)	(0.368)	(0.261)	(0.179)	(0.495)	(0.182)	(0.264)
Pop64	-0.239	-0.171	-0.057	-0.024	-0.027	0.039	-0.709	0.057	-0.111	-0.122	-0.105	-0.094	-0.039
	(0.187)	(0.174)	(0.160)	(0.123)	(0.146)	(0.212)	(0.719)	(0.221)	(0.192)	(0.163)	(0.157)	(0.143)	(0.123)
No. of obs.	486	486	486	486	486	486	486	486	486	486	486	486	486
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	13	13	13	13	13	13	13	13	13	13	13	13	13
AR (1) p-value	0.026	0.035	0.058	0.038	0.054	0.077	0.001	0.005	0.006	0.017	0.140	0.090	0.222
AR (2) p-value	0.518	0.809	0.679	0.230	0.255	0.186	0.540	0.254	0.900	0.770	0.847	0.305	0.762
Hansen Test	0.653	0.280	0.237	0.680	0.570	0.204	0.561	0.822	0.376	0.133	0.148	0.146	0.096

Notes: Estimation of Equation (4.1) using the System-GMM estimator. *Election* is measured in the election year. Control variables are lagged one year. Instruments for System-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation, and lagged difference (one period) of the variable for the level equation. The election and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 5.6: Difference-GMM Estimator: Net PATRs for the Period 2010-16

Dependent Variable: Net PATR for each Household Type (HT)

	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election	0.447	0.616*	0.613**	0.539**	0.538**	0.480	2.151	1.092	1.211	0.709**	0.495*	0.452	0.535**
	(0.474)	(0.316)	(0.292)	(0.240)	(0.259)	(0.313)	(1.976)	(1.169)	(0.947)	(0.302)	(0.270)	(0.289)	(0.251)
Election: Right	-0.0234	-0.349	-0.224	-0.119	-0.144	-0.188	-1.156	-0.620	-0.235	0.0388	0.210	0.00511	-0.0453
	(0.614)	(0.398)	(0.402)	(0.352)	(0.343)	(0.424)	(2.231)	(1.313)	(1.011)	(0.639)	(0.597)	(0.418)	(0.390)
Election: Left	0.187	-0.447	-0.215	0.246	0.397	0.422	-1.354	0.135	-0.551	0.0974	0.525	-0.232	0.410
	(0.953)	(0.985)	(0.765)	(0.771)	(0.723)	(0.919)	(2.167)	(1.734)	(1.200)	(1.026)	(1.132)	(0.980)	(0.964)
Right-wing	0.361	0.696	0.317	-0.486	-0.594	-0.514	0.390	-1.219	-0.657	-0.701	-1.007	0.322	-0.696
	(1.312)	(1.144)	(0.956)	(0.663)	(0.585)	(0.643)	(1.853)	(1.533)	(1.854)	(1.560)	(1.305)	(0.974)	(0.876)
Left-wing	0.808	1.044	0.879	0.418	0.247	0.125	1.469	0.366	1.116	0.774	0.457	1.180*	0.438
	(1.078)	(0.791)	(0.662)	(0.391)	(0.359)	(0.337)	(1.452)	(0.714)	(0.970)	(0.718)	(0.480)	(0.647)	(0.447)
Coalition	0.213	0.134	0.246	0.289	0.440	0.468	1.033	1.231	1.342	0.364	0.340	0.475	0.329
	(0.748)	(0.791)	(0.571)	(0.634)	(0.645)	(0.796)	(0.892)	(1.211)	(1.448)	(0.877)	(0.883)	(0.856)	(0.777)
Lagged PATR	0.721	0.370	0.550	0.529	0.526	0.746	0.956***	1.116**	1.907	0.869	0.722	0.717	0.578
	(0.929)	(0.547)	(0.428)	(0.351)	(0.387)	(0.592)	(0.255)	(0.500)	(1.581)	(0.871)	(0.582)	(0.517)	(0.427)
No. of obs.	130	130	130	130	130	130	130	130	130	130	130	130	130
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
No. of instruments	16	16	16	16	16	16	16	16	16	16	16	16	16
AR (1) p-value	0.414	0.416	0.200	0.116	0.223	0.233	0.061	0.035	0.278	0.259	0.158	0.138	0.136
AR (2) p-value	0.651	0.569	0.795	0.384	0.363	0.297	0.831	0.856	0.824	0.488	0.250	0.650	0.356
Hansen test p-value	0.265	0.038	0.096	0.204	0.695	0.445	0.589	0.635	0.796	0.242	0.321	0.118	0.208

Notes: Estimation of Equation (4.1) using the Difference-GMM estimator. *Election*, *Election: Right* and *Election: Left* are measured in the election year. Control variables are lagged one year. Instruments for Difference-GMM regressions: Lagged levels (first-order to second-order lags) of the lagged dependent variable for the differenced equation. The election and ideology dummies, the interaction terms and the remaining control variables are considered as exogenous and instrumented by themselves in the differenced equation. The matrix of instruments has been collapsed. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 6.1: QMLE Estimates of PATR on Incumbent Vote Share: *Overall PATR*

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Overall PATR: Right	-1.826*	-2.178	-2.402	-2.834*	-2.696*	-2.088*	-0.488	-1.654**	-2.083*	-3.182**	-3.602**	-2.238	-3.247**
	(1.104)	(1.428)	(1.593)	(1.608)	(1.439)	(1.201)	(0.689)	(0.798)	(1.118)	(1.264)	(1.412)	(1.511)	(1.640)
Overall PATR: Left	-1.803	-2.060	-2.156	-2.342	-2.002	-1.164	-0.704	-1.648**	-2.090*	-3.227**	-3.501***	-1.963	-2.731*
	(1.156)	(1.461)	(1.616)	(1.612)	(1.479)	(1.293)	(0.696)	(0.745)	(1.098)	(1.259)	(1.357)	(1.519)	(1.640)
Overall PATR	2.239*	2.531	2.263	2.172	1.784	0.407	1.147	2.121**	2.266*	3.543**	3.602**	2.012	2.404
	(1.315)	(1.721)	(1.883)	(1.879)	(1.824)	(1.722)	(0.841)	(0.988)	(1.267)	(1.386)	(1.447)	(1.874)	(1.930)
Right-wing	-0.493	-0.457	-0.431	-0.358	-0.383	-0.481	-0.431	-0.612	-0.590	-0.542	-0.448	-0.508	-0.326
	(0.476)	(0.498)	(0.509)	(0.516)	(0.502)	(0.482)	(0.500)	(0.449)	(0.461)	(0.457)	(0.462)	(0.490)	(0.514)
Left-wing	0.372	0.412	0.423	0.486	0.443	0.302	0.277	0.174	0.234	0.346	0.461	0.356	0.536
	(0.552)	(0.582)	(0.596)	(0.601)	(0.573)	(0.542)	(0.503)	(0.499)	(0.515)	(0.528)	(0.535)	(0.572)	(0.601)
Coalition	-0.076	-0.085	-0.091	-0.095	-0.090	-0.073	-0.067	-0.073	-0.080	-0.094	-0.093	-0.092	-0.100
	(0.081)	(0.082)	(0.082)	(0.083)	(0.083)	(0.083)	(0.086)	(0.081)	(0.081)	(0.081)	(0.080)	(0.082)	(0.083)
Previous vote	0.415	0.386	0.416	0.401	0.374	0.382	0.371	0.379	0.433	0.256	0.226	0.417	0.365
	(0.518)	(0.517)	(0.509)	(0.498)	(0.499)	(0.493)	(0.491)	(0.489)	(0.509)	(0.490)	(0.483)	(0.514)	(0.503)
No. of observations	132	132	132	132	132	132	132	132	132	132	132	132	132
Log pseudolikelihood	-51.69	-51.70	-51.70	-51.70	-51.70	-51.70	-51.68	-51.65	-51.68	-51.63	-51.63	-51.70	-51.68
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Overall PATR* measures the average for all the years starting with the PATR after the previous election and including the PATR of the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 6.2: QMLE Estimates of PATR on Incumbent Vote Share: Excluding Electoral Year

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
PreElection PATR: Right	-1.913*	-2.048	-2.121	-2.505*	-2.197*	-1.601	-0.242	-1.311*	-1.664	-2.526**	-2.632**	-2.155	-2.930*
	(1.044)	(1.347)	(1.488)	(1.514)	(1.329)	(1.118)	(0.723)	(0.769)	(1.040)	(1.172)	(1.288)	(1.418)	(1.551)
PreElection PATR: Left	-1.714	-1.845	-1.847	-2.033	-1.561	-0.662	-0.425	-1.407**	-1.762*	-2.651**	-2.598**	-1.815	-2.410
	(1.080)	(1.357)	(1.496)	(1.506)	(1.354)	(1.192)	(0.716)	(0.717)	(1.046)	(1.188)	(1.247)	(1.397)	(1.538)
PreElection PATR	2.860**	3.018*	2.677	2.215	1.705	0.0688	1.182	2.366**	2.640**	3.835***	3.225**	2.210	2.457
	(1.189)	(1.563)	(1.734)	(1.780)	(1.712)	(1.667)	(0.870)	(0.929)	(1.231)	(1.364)	(1.379)	(1.709)	(1.839)
Right-wing	-0.478	-0.469	-0.453	-0.373	-0.416	-0.528	-0.391	-0.538	-0.545	-0.487	-0.432	-0.500	-0.336
	(0.467)	(0.496)	(0.514)	(0.521)	(0.509)	(0.495)	(0.488)	(0.451)	(0.466)	(0.463)	(0.473)	(0.493)	(0.520)
Left-wing	0.454	0.457	0.449	0.480	0.414	0.244	0.301	0.272	0.304	0.407	0.455	0.390	0.526
	(0.538)	(0.580)	(0.603)	(0.608)	(0.581)	(0.558)	(0.497)	(0.501)	(0.516)	(0.528)	(0.537)	(0.574)	(0.606)
Coalition	-0.0676	-0.0775	-0.0855	-0.0914	-0.0856	-0.0702	-0.0717	-0.0732	-0.0792	-0.0913	-0.0956	-0.0888	-0.0974
	(0.0810)	(0.0805)	(0.0806)	(0.0810)	(0.0812)	(0.0819)	(0.0857)	(0.0811)	(0.0816)	(0.0803)	(0.0837)	(0.0813)	(0.0814)
Previous vote	0.296	0.275	0.308	0.351	0.352	0.400	0.265	0.292	0.343	0.128	0.182	0.351	0.308
	(0.512)	(0.511)	(0.503)	(0.492)	(0.493)	(0.490)	(0.492)	(0.490)	(0.510)	(0.490)	(0.506)	(0.506)	(0.495)
No. of observations	132	132	132	132	132	132	132	132	132	132	132	132	132
Log pseudolikelihood	-51.67	-51.69	-51.70	-51.70	-51.71	-51.71	-51.66	-51.63	-51.67	-51.62	-51.65	-51.70	-51.69
No. of countries	26	26	26	26	26	26	26	26	26	26	26	26	26
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *PreElection PATR* measures the average of the PATR starting with the year after the previous election and including all years over the electoral term except for the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level.The reference country is Luxembourg.

Appendix Table 6.3: QMLE Estimates of PATR on Incumbent Vote Share: Sample period 2006-16

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	2.995	-1.846	-4.890	-7.779	-13.60**	-26.57***	0.405	-9.833**	-8.714**	-6.643	-3.433	-1.547	-5.354
	(4.825)	(6.148)	(6.424)	(6.830)	(6.467)	(6.619)	(2.289)	(4.134)	(3.941)	(4.621)	(4.546)	(4.667)	(5.310)
Election PATR: Left	2.480	5.590	12.59*	25.74***	28.71***	16.29*	-5.075	-0.774	-0.848	1.290	10.56**	12.92***	24.98***
	(5.595)	(6.919)	(7.615)	(7.341)	(8.943)	(8.764)	(3.397)	(4.004)	(4.225)	(6.322)	(5.011)	(3.853)	(5.809)
Election PATR	-8.948***	-5.798	-6.943	-7.198	-2.481	9.955*	1.040	1.264	-0.389	-3.735	-5.013*	-7.916***	-6.634*
	(2.495)	(3.915)	(5.131)	(5.937)	(6.043)	(5.835)	(1.122)	(1.894)	(2.510)	(2.647)	(2.991)	(2.609)	(3.632)
Right-wing	-0.820	-0.557	-0.626	-0.578	-0.508	-0.968	0.0191	-0.710	-0.533	-0.432	-0.185	-0.850	-0.692
	(0.566)	(0.556)	(0.565)	(0.601)	(0.608)	(0.651)	(0.613)	(0.732)	(0.730)	(0.601)	(0.603)	(0.595)	(0.587)
Left-wing	1.863**	2.836**	3.621***	4.269***	3.766***	2.433*	0.203	2.094**	1.981*	1.996*	2.634**	2.938***	3.743***
	(0.837)	(1.143)	(1.208)	(1.210)	(1.193)	(1.286)	(1.167)	(0.984)	(1.062)	(1.089)	(1.055)	(0.892)	(1.040)
Coalition	-0.123	-0.025	-0.063	-0.112	-0.056	-0.001	-0.017	-0.031	-0.054	-0.071	-0.069	-0.120	-0.115
	(0.118)	(0.100)	(0.099)	(0.098)	(0.090)	(0.083)	(0.125)	(0.096)	(0.088)	(0.093)	(0.092)	(0.107)	(0.097)
Previous vote	-0.146	0.036	-0.074	-0.149	0.193	0.638	0.930	0.904	0.853	0.407	0.272	-0.183	-0.178
	(0.525)	(0.534)	(0.525)	(0.491)	(0.479)	(0.467)	(0.843)	(0.639)	(0.629)	(0.590)	(0.580)	(0.508)	(0.505)
No. of observations	61	61	61	61	61	61	61	61	61	61	61	61	61
Log pseudolikelihood	-23.29	-23.35	-23.33	-23.31	-23.30	-23.27	-23.35	-23.35	-23.34	-23.33	-23.33	-23.31	-23.31
No. of countries	24	24	24	24	24	24	24	24	24	24	24	24	24
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 6.4: QMLE Estimates of PATR on Incumbent Vote Share: Sample Period 1996-2016, Excluding Denmark and Sweden

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR: Right	3.050	2.196	0.635	-0.342	-3.236	-5.449	-0.687	-0.606	-1.896	-0.274	-1.095	4.240	1.815
	(3.892)	(4.097)	(3.888)	(4.438)	(4.394)	(4.684)	(1.150)	(3.025)	(2.813)	(3.504)	(3.422)	(4.081)	(4.228)
Election PATR: Left	-4.349	-9.124**	-11.52***	-8.349	-11.71**	-13.58***	-3.684***	-6.234***	-8.989***	-9.310***	-5.913*	-3.636	-6.079
	(3.592)	(4.211)	(4.181)	(5.135)	(5.137)	(5.122)	(0.908)	(2.312)	(2.946)	(3.089)	(3.342)	(4.117)	(4.872)
Election PATR	-1.494	0.916	0.980	4.117	5.714	8.317**	1.049	2.449	2.391	0.454	2.666	-0.683	1.746
	(2.240)	(3.140)	(3.371)	(4.135)	(4.206)	(3.923)	(0.658)	(2.120)	(2.410)	(2.169)	(2.544)	(2.690)	(3.711)
Right-wing	-0.640	-0.541	-0.646	-0.687	-0.760	-0.898*	-0.508	-0.753	-0.747	-0.618	-0.765*	-0.628	-0.648
	(0.455)	(0.441)	(0.455)	(0.469)	(0.489)	(0.490)	(0.432)	(0.461)	(0.460)	(0.466)	(0.457)	(0.441)	(0.457)
Left-wing	0.502	0.413	0.548	0.224	0.220	0.0529	0.397	0.310	0.483	0.658	0.428	0.335	0.302
	(0.565)	(0.560)	(0.591)	(0.601)	(0.606)	(0.622)	(0.487)	(0.525)	(0.526)	(0.540)	(0.526)	(0.570)	(0.586)
Coalition	-0.016	-0.007	0.002	-0.030	-0.033	-0.050	-0.023	-0.027	-0.021	-0.005	-0.024	-0.023	-0.027
	(0.090)	(0.091)	(0.091)	(0.094)	(0.095)	(0.095)	(0.089)	(0.084)	(0.087)	(0.087)	(0.090)	(0.090)	(0.091)
Previous vote	0.291	0.438	0.457	0.373	0.426	0.425	0.638	0.455	0.376	0.353	0.258	0.238	0.351
	(0.498)	(0.434)	(0.424)	(0.467)	(0.453)	(0.468)	(0.493)	(0.489)	(0.484)	(0.475)	(0.522)	(0.488)	(0.466)
No. of observations	121	121	121	121	121	121	121	121	121	121	121	121	121
Log pseudolikelihood	-47.16	-47.12	-47.10	-47.18	-47.15	-47.11	-47.07	-47.06	-47.08	-47.08	-47.17	-47.19	-47.19
No. of countries	24	24	24	24	24	24	24	24	24	24	24	24	24
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Variables described in Table 6.1. Control variables included but not shown. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.

Appendix Table 7.1: Descriptive Statistics

Variables	Count	Mean	Std. Deviation	Min	Max
Election PATR: HT1	63	-0.001	0.014	-0.040	0.048
Election PATR: HT2	63	-0.001	0.013	-0.039	0.037
Election PATR: HT3	63	-0.001	0.013	-0.041	0.031
Election PATR: HT4	63	0.001	0.014	-0.030	0.051
Election PATR: HT5	63	0.000	0.014	-0.030	0.044
Election PATR: HT6	63	0.000	0.013	-0.033	0.033
Election PATR: HT7	63	-0.005	0.045	-0.262	0.085
Election PATR: HT8	63	-0.001	0.028	-0.174	0.060
Election PATR: HT9	63	-0.001	0.018	-0.065	0.053
Election PATR: HT10	63	-0.001	0.015	-0.041	0.050
Election PATR: HT11	63	0.001	0.016	-0.035	0.055
Election PATR: HT12	63	-0.000	0.013	-0.033	0.047
Election PATR: HT13	63	0.000	0.013	-0.030	0.051
VS^C					
Previous vote	63	0.352	0.086	0.143	0.518
Win(I) Right	63	0.175	0.383	0	1
Win(I) Left	63	0.175	0.383	0	1
Win(II) Right	63	0.190	0.396	0	1
Win(II) Left	63	0.238	0.429	0	1
Coalition	63	0.587	0.496	0	1
ln *GDP**	63	-3.757	1.567	-7.236	-1.084
ln *GDP per capita**	63	1.058	0.626	-0.354	2.359
*GDP growth**	63	0.024	0.023	-0.026	0.084
*Inflation**	63	0.026	0.019	-0.014	0.086
*Unemployment**	63	0.089	0.042	0.031	0.243
*Govt exp**	63	0.453	0.058	0.330	0.560
*Illiteracy**	63	0.033	0.038	0.002	0.187

Note: * denotes the average of the variable

Appendix Table 7.2: Effect of a change in PATR in the election year on Incumbent Vote Share in Consecutive Elections Including Control Variables

Dependent Variable: Vote Share of Incumbent Government

Household Types:	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	HT10	HT11	HT12	HT13
Election PATR:	-17.19***	-3.751	2.536	3.155	2.924	3.715	0.271	-7.898***	-3.042	-1.908	-10.66***	-1.107	2.448
Win(I) Right	(5.436)	(5.574)	(6.190)	(6.937)	(6.763)	(5.500)	(1.398)	(2.415)	(2.208)	(3.971)	(3.483)	(5.435)	(8.173)
Election PATR:	-16.23***	-5.742	1.115	5.741	5.552	9.225	-1.749	-12.04**	-9.956***	-5.146	-5.635	-3.295	5.440
Win(II)Right	(3.486)	(5.066)	(5.893)	(7.599)	(7.765)	(7.917)	(1.508)	(4.997)	(3.337)	(4.564)	(4.950)	(5.035)	(8.278)
Election PATR:	-16.39***	-6.931	-2.374	-0.00152	-0.300	2.395	-1.819**	-7.774***	-8.271***	-5.763*	-11.17***	-4.245	0.215
Win(I) Left	(2.753)	(4.480)	(5.465)	(6.368)	(6.266)	(6.148)	(0.904)	(1.598)	(1.729)	(3.218)	(2.212)	(5.256)	(6.692)
Election PATR:	-14.05***	-5.631*	-1.057	2.905	3.399	7.214	-4.477*	-5.541*	-6.473*	-3.833	-5.561*	-3.785	3.253
Win(II) Left	(3.696)	(3.355)	(4.653)	(5.546)	(5.488)	(4.977)	(2.354)	(3.104)	(3.366)	(3.035)	(3.211)	(4.803)	(5.728)
Election PATR	15.32***	3.820	-1.979	-1.516	-1.422	-1.480	0.700	6.187***	5.110***	1.813	8.336***	2.242	-1.927
	(3.183)	(4.540)	(5.621)	(5.987)	(5.835)	(4.429)	(0.874)	(1.561)	(1.427)	(2.845)	(2.305)	(4.599)	(6.258)
Win(I) Right	0.129	0.197**	0.227**	0.330**	0.336**	0.437***	0.266***	0.295***	0.257***	0.226**	0.176*	0.226*	0.310**
	(0.0842)	(0.0853)	(0.110)	(0.157)	(0.159)	(0.148)	(0.0946)	(0.0923)	(0.0976)	(0.0894)	(0.0973)	(0.125)	(0.153)
Win(I) Left	0.310***	0.361***	0.387***	0.462***	0.469***	0.539***	0.412***	0.422***	0.408***	0.372***	0.377***	0.405***	0.447***
	(0.0826)	(0.112)	(0.127)	(0.165)	(0.172)	(0.156)	(0.100)	(0.111)	(0.111)	(0.113)	(0.108)	(0.134)	(0.161)
Win(II) Right	-0.0184	0.0234	0.0364	0.132	0.145	0.254	0.0796	0.139	0.0734	0.0416	-0.0242	0.0506	0.111
	(0.0915)	(0.0962)	(0.120)	(0.160)	(0.167)	(0.158)	(0.107)	(0.105)	(0.109)	(0.0998)	(0.107)	(0.134)	(0.150)
Win(II) Left	0.129	0.174*	0.185	0.262	0.269	0.332**	0.255**	0.271**	0.233**	0.198*	0.157	0.209	0.245
	(0.0856)	(0.103)	(0.116)	(0.165)	(0.166)	(0.151)	(0.100)	(0.111)	(0.108)	(0.105)	(0.105)	(0.132)	(0.160)
Coalition	0.100	0.163	0.180	0.128	0.128	0.107	0.155	0.111	0.167	0.160	0.193*	0.164	0.135
	(0.101)	(0.131)	(0.126)	(0.116)	(0.109)	(0.0976)	(0.115)	(0.111)	(0.119)	(0.124)	(0.109)	(0.126)	(0.117)
Previous Vote	-0.564	-0.420	-0.521	-0.640	-0.696*	-0.765*	-0.228	-0.536	-0.557	-0.514	-0.839**	-0.587	-0.665
	(0.398)	(0.479)	(0.405)	(0.442)	(0.417)	(0.445)	(0.451)	(0.418)	(0.434)	(0.459)	(0.358)	(0.457)	(0.440)
Constant	-24.73***	-15.85**	-8.217	-8.623	-8.641	-9.058	-11.81***	-19.93***	-17.03***	-12.94**	-20.18***	-9.313**	-5.430
	(5.367)	(6.267)	(9.322)	(8.733)	(8.858)	(7.689)	(4.436)	(5.069)	(4.786)	(5.794)	(5.641)	(3.978)	(5.474)
Control Variables:													
ln *GDP*	-2.977***	-1.915**	-0.937	-0.982	-0.980	-1.058	-1.365**	-2.406***	-2.027***	-1.547**	-2.365***	-1.706**	-0.908
	(0.665)	(0.779)	(1.198)	(1.128)	(1.157)	(1.013)	(0.544)	(0.630)	(0.581)	(0.711)	(0.681)	(0.798)	(1.138)
ln *GDP per capita*	3.825***	2.409**	1.356	1.433	1.445	1.480	1.868***	3.118***	2.727***	2.022**	3.400***	2.207**	1.342
	(0.738)	(0.979)	(1.375)	(1.289)	(1.299)	(1.112)	(0.675)	(0.746)	(0.701)	(0.926)	(0.838)	(0.953)	(1.307)
GDP growth	2.744***	1.289	0.785	1.089	1.014	0.570	1.176	2.303**	1.710*	1.124	2.525***	1.314	0.942
	(0.867)	(1.096)	(1.404)	(1.304)	(1.254)	(1.266)	(1.165)	(0.942)	(1.013)	(1.207)	(0.939)	(1.180)	(1.308)
ln *Inflation*	2.795*	1.242	0.222	0.520	0.642	0.667	0.903	1.989	1.755	0.706	0.798	0.899	0.232
	(1.695)	(2.053)	(2.296)	(2.240)	(2.198)	(2.150)	(2.024)	(1.808)	(1.800)	(2.014)	(1.558)	(1.997)	(2.144)

Unemployment	-0.0318	-0.714	-1.004	-0.921	-0.960	-1.057	-0.614	-0.708	-0.490	-1.058	-0.0782	-0.650	-1.035
	(1.035)	(1.100)	(1.169)	(1.025)	(0.985)	(0.856)	(1.118)	(1.064)	(1.024)	(1.167)	(0.993)	(1.009)	(0.990)
Govt exp	-0.850	-0.726	-0.574	-0.492	-0.452	-0.495	-0.559	-1.102	-1.152	-0.759	-1.624	-0.634	-0.555
	(1.039)	(1.172)	(1.198)	(1.231)	(1.273)	(1.451)	(1.173)	(1.020)	(1.081)	(1.154)	(1.024)	(1.299)	(1.305)
Illiteracy	-1.054	-0.759	-0.0785	0.458	0.440	0.378	-0.390	-1.065	-0.803	-0.478	-0.862	-0.438	0.453
	(0.820)	(0.744)	(0.825)	(0.804)	(0.831)	(0.754)	(0.785)	(0.883)	(0.853)	(0.749)	(0.914)	(0.777)	(0.934)
No. of observations	63	63	63	63	63	63	63	63	63	63	63	63	63
Log-Pseudo likelihood	-25.56	-25.59	-25.60	-25.60	-25.60	-25.60	-25.58	-25.57	-25.57	-25.59	-25.56	-25.60	-25.60
No. of countries	22	22	22	22	22	22	22	22	22	22	22	22	22
Country Fixed Effs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Estimation of Equation (4.2). *Election PATR* measures the change between the PATR in the election year and the average of PATR starting with the previous election year and excluding the current election year. Robust standard errors in parentheses. Significant at *** = 1%, ** = 5% and * = 10% level. The reference country is Luxembourg.