

THE IMPACT OF
MACROECONOMIC PERFORMANCE
ON
VOTING BEHAVIOR

Masters Thesis in Economics by

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Preface

This thesis is written during the spring of 2005. It is to a large extent empirical, a consequence of my work as a research assistant for Professor Steinar Holden. Even though the dataset used here ended up being totally different from the one I worked with for him, the process would never even started if not for this work and for the fact that he encouraged me to use the dataset for my thesis.

I would like to thank my supervisor, Professor Karl-Ove Moene, both for his skilled guidance, and for his effort to teach me how to write properly. He also deserves a special thanks for helping and encouraging me to get the thesis ready in time for the deadline. I would like to thank Erling Barth, Frederik Wulfsberg and Erik Biørn for valuable help on the empirical part. Jo Thori Lind deserves a special comment for always being helpful when asked and for sharing his excellent skills on empirical work. I am very grateful.

I have been working together with Jørgen Modalsli, who has done a completely different thesis, but on the same data. This has been to great help.

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Abstract

Politics have an impact on the economy. But has the state of the economy any impact on politics? Can economic fluctuations explain fluctuations in voters' policy demand? Can the outcome of elections be traced back to changes in growth and unemployment?

In the classical explanation of voting behavior, factors such as class, religion, and structure of the society are used as determinants for policy preferences¹. The aim of my thesis is to explain short-run fluctuations in policy preferences with short-run fluctuations in the economy. A synthesis can be made of these two approaches. "Short-run" economic variables can explain fluctuations in policy demand from election to election within a country. Trends in policy demand are more often the result of by "long-run" sociological variables, that change slowly over time.

Using a dataset for 23 OECD countries and their elections between 1960 and 1995, I have investigated whether such a model can explain changes in policy sentiments. The results indicate that a high unemployment rate makes the median voter vote more conservative (right). High economic growth makes the median voter vote more radical (left). The sociological variables explain a large part of the political variation between countries.

I argue that the key to understanding these fluctuations is social insurance. The middle class, who constitutes the main segment of the voters in OECD countries, rely on social insurance provided by the welfare state. Their demand for insurance depends on their perception of their future income and job security.

Insurance is considered a normal good – something you want more if your income rises. If the economy prospers, your expected income increases. Consequently, you would like to buy more social insurance. Left parties are known to increase budgets and provide more social insurance – at the price of higher tax payments.

At the day of election, voters cast their vote to signal what kind of public policies they prefer in the forthcoming period. In this way, the vote can be seen as a signal to politicians of how much insurance the public wants.

¹ Stevenson (2001), p.621

This helps explain why the median voter seems to vote more radical when economic growth is high, which also has strong support in the data.

The need for insurance is, however, not only influenced by the willingness to pay for it. The risk of needing it is just as important. I argue that voters, at the beginning of a recession, fear for their jobs and thus buy more insurance. Consequently, I expect voters to vote more radical if the unemployment rate rises at the time of the election. At this point in time, the welfare state functions as insurance for the middle class. They know that the recession will remove jobs but not whose jobs that is to be lost.

At the bottom of the recession, when the unemployment rate peaks, voters no longer need to fear for their jobs. They have either kept it or lost it. The uncertainty that made voters prefer more insurance is gone. At this point one should expect voters to be less willing to pay taxes since the tax payments will cover the unemployment benefits of the few that lost their job – paid by the many that kept theirs. Consequently, one should expect the median voter to demand more right policies when the unemployment rate is high. The latter prediction has strong support in the data analysis. The prediction that an increase in the unemployment rate prior to the election leads to more radical voting has only some support in the data.

Just as politics influence the economy does the state of the economy influence politics. Voters' policy demand seems to be influenced by both economic growth and the unemployment rate.

1. Introduction

Has the state of the economy any impact on voting behavior? If so, how is the relationship? Why should the state of the economy have any impact on the outcome of elections? In this thesis I will try to answer these questions.

The topic, called *economic voting*, has been increasingly investigated, both by political scientists and economists, over the later years. Even so, the field is rather under-researched. One reason for this can be that the empirical material is limited, since elections are held several years apart. Another reason may be that the idea of short-run economic fluctuations' influence on voting behavior stands in opposition to the classical explanations of voting behavior – explaining party preferences as a result of class struggle, religion, social background, etc. If the state of the economy has any impact on the outcome of elections, this might explain why policy sentiments also fluctuate in the short run. These fluctuations are too short and frequent to be caused by a change in structural factors like those mentioned above.

The hypothesis in this thesis builds on Durr (1993) and Stevenson (2001): Voters policy demand move left when the economy is prospering and right when the economy faces a recession.

Improved understanding of the interaction between politics and the economy is the motivation for this thesis, as well as the motivation for Political Economics in general. In simple macroeconomics, politics are treated as an exogenous factor, not influenced by the economy. By treating both the economy and politics endogenously and influenced by each other, a deeper understanding may be reached. The aim of this thesis is to cover a small piece of this large field.

In section 2, I give a review of literature related to this question. Section 3 contains arguments for why and how the economy should have an impact. In section 4 I present a simple model that bridges the gap between the short-run arguments and the traditional sociological way of reasoning. In section 5 I present the data and in section 6 I present the results from the estimations using data from OECD countries. In section 7 I conclude.

The statistical analyses are done with STATA 8.0 and Microsoft Excel.

2. Review of the literature

The theories of economic voting are in sharp contrast to the *sociological model of political behavior*. In the sociological models, policy preferences are explained by factors as class, religion, and structure of society². This demands a change in policy preferences to be caused by a more fundamental change in the society. Consequently, short-term fluctuations in the political opinion have been ignored or presumed to be random³.

The phenomenon of economic voting has been a topic in Economics and in Political Science research since the 1920's⁴. These first analyses considered how people voted when times were bad, using simple statistical methods and often lacking theoretical arguments for why the relationship should be present. A common hypothesis in these papers was: the republican share of votes is positively correlated with the business cycle⁵. The other early branch of research examined the hypothesis that economic prosperity increased the support for the incumbent⁶. They all find, even though methodologically weak and insufficient, indications for both hypotheses being correct, using US data only.

An early contribution in this field was theoretical and came with *An Economic Theory of Voting* by Anthony Downs (1957). Criticizing both political scientists and economists Downs claimed that democracy could never be understood normatively. Even though we would like politicians to maximize some kind of social welfare function, there is no reason to believe they would do so, unless it is in their private interest. Downs claimed that⁷:

“Political parties in a democracy formulate policy strictly as a means of gaining votes. They do not seek to gain office in order to carry out certain preconceived policies or to serve any particular interest groups; rather they formulate policies and serve interest groups in order to gain office”

(...)

² Stevenson (2001) p.621, see also: Franklin, Mackie and Valen (1992), Dalton, Flanagan and Beck (1984), Inglehart (1990).

³ Stevenson (2001) p.622

⁴ Monroe (1979) p.139

⁵ See Monroe (1979) for a comprehensive review; research sharing this hypothesis includes: Barnhart (1925), Kerr (1944) and Rees (1962).

⁶ Early research sharing this hypothesis includes: Tibbitts (1931), Ogburn and Coombs (1940), Gosnell and Coleman (1949) and Pearson and Myers (1948).

⁷ Downs (1957); p.137

“..the government always acts so as to maximize the number of votes it will receive. In effect, it is an entrepreneur selling policies for votes instead of products for money.”

(...)

We cannot assume a priori that [the voter’s] behavior is socially optimal any more than we can assume a priori that a given firm produces the socially optimal output.”

Downs assumes that the voter’s expectations are *retrospective* and claims that they cast their vote in a utility maximizing manner, considering the results from the incumbent party and the “offer” from the opposition⁸. Claiming that it is irrational for most voters to acquire political information⁹, Downs differ from the ultra-rationalist¹⁰ approach used later by McCallum (1978) and others to criticize political business cycle theory¹¹.

Since Downs, the field has expanded and several branches and schools have developed. The main fields, relevant for this thesis, are:

I Preferences and rationality in a Democracy

II Voting behavior or Policy demand

III Political business cycle theory

I Preferences and rationality in a Democracy

The by far most common specification of voter’s preferences is to assume voters to be self-interested, preferring policies that maximize own utility only¹². There is a paradox connected to this. Since the marginal effect of a single vote is close to zero, and voting has a cost in terms of time and effort, it is hard to see why a purely self-interested voter should vote at all¹³. The relatively high turn-out in western democracies may be explained by some kind of idealistic

⁸ Downs (1957) p. 138, quota

⁹ Downs (1957) p. 147

¹⁰ Term comes from Nordhaus (1988)

¹¹ Political business cycle theory first presented by Nordhaus (1975)

¹² Downs (1957), Moene and Wallerstein (2003), Nordhaus (1975) and many others.

¹³ See Wallerstein (2004) for a discussion.

voting behavior. It might be the case that voters have an idealistic attitude towards democracy as such, being idealistic in the decision of *whether to vote or not*, and purely self-interested in the decision of *what to vote*. A more realistic approach, however, is to say that voters are driven by a combination of idealism and self-interest - voting both for the best of oneself and the country.

A parallel to the assumptions about the voters' preferences is the assumptions of the preferences of the political parties. Since Downs (1957) a common approach is to assume political parties to be purely opportunistic in the sense that their only goal is to remain in office. There is also an important tradition assuming that politicians are directly motivated by the outcome of their policies¹⁴. This is called *partisan* politics or politicians. Downs applies a version of Harold Hotelling's apparatus presented in the famous "Stability in Competition"¹⁵ to analyze the orientation of the political parties. As an illustration, Hotelling considers a beach with two ice-cream bars. To maximize their share of the market (the beach) they will both be situated in the middle of the beach, beside each other. If not, it is because they have some kind of special preferences of being situated somewhere else. Applying this on politics, a simple test of whether the political parties in a two-party system are purely office-seeking or partisan, is whether their political programs are more or less identical or not¹⁶. If identical, they try to maximize their share of the electorate, if not, it is because they have some kind of *partisan* interest in keeping the program the way it is. In a multiparty system however, this simple (and non-sufficient) test will not give a clear answer.

The question of voter's rationality is of greater importance for this thesis. One approach is to assume the voters to be ultra-rational – with the same information as parties, being forward-looking, and suffer from no memory lapses¹⁷. In this context this means that voters are able to split cyclical from permanent growth, discretionary from induced policies etc. It seems rather obvious that this is not *literally* the case. The opposite approach is to assume voters to be naïve, usually by applying some sort of adaptive, retrospective expectations. In its simplest fashion this means that voters consider past performance and the actual state of the economy as the result of the incumbent. If the situation has improved - reelect the incumbent, if not – vote for the

¹⁴ Persson and Tabellini (2000) p. 97

¹⁵ Downs (1957) p. 142, Hotelling (1929)

¹⁶ Valid if one assume voters preferences to be closer to a normal distribution than to a polarized two-peaked distribution. The argument is built on Downs (1957) p. 143

¹⁷ Nordhaus (1988) p. 4

opposition¹⁸. At first, the naïve voter approach may seem the most realistic. Even so the best way to model the voters may not be to assume them acting according to some simple rule-of-thumb¹⁹. Alesina (1988) argues in favor of voters that are rational but imperfectly informed²⁰:

“(...) if voters are so naïve and the parties are so opportunistic, shouldn’t we observe a much more pronounced electoral manipulation of policy instruments, particularly of those under direct control of the incumbent? I think the answer is that if the manipulation became excessive, the New York Times would start writing about it and that it would be counterproductive for the incumbent.”

There are two connected but not synonymous dichotomies used on rationality: retrospective vs. prospective expectations and rational vs. naïve. How are they connected? “Downs (1957) points out that the best indicator of future performance is past performance. Voters who look backward may, in that sense, also be prospective voters²¹.” It can also be argued that prospective considerations, in the sense that one picks the party that will create the most prosperity in the future, is “little more than partisan rationalizations²².” I think one may conclude that the “ultra-rationalists” will consider retrospective expectations to be naïve, but that the ones believing in retrospective expectations will consider themselves as rational – not naïve.

There are also several empirical studies in this field, but as far as I can tell, it is not possible to draw a general conclusion²³.

An interesting approach outside the rationality debate is an analysis by Peltzman (1992). Following Niskanen (1975) Peltzman claims that voters are fiscal conservatives²⁴ and that data shows that voters generally punish governments that increases public spending. Arguing that politics suffer from an agency problem²⁵, he claims that the government has grown faster than the voters wish²⁶.

¹⁸ Lanoue (1994) p. 193, Monroe (1979) p. 144

¹⁹ Alesina (1988) p. 51, afterword following Nordhaus (1988)

²⁰ Alesina (1988) p. 53

²¹ Lanoue (1994) p. 204

²² Lockerbie (1991) from Lanoue (1994) p. 195

²³ Empirical research includes Lanoue (1994), Suzuki (1991), Suzuki (1996)

²⁴ In the meaning that they oppose increased government spending.

²⁵ With the voters being the principal and the politicians their agent, the agency problem occurs when the politicians not only follows the voter’s interests.

²⁶ Peltzman (1992) p. 358

II Voting behavior or policy demand

What characterizes economic voting behavior over time? One can identify two separate branches in this field, divided by the time perspective [implicitly] used.

Common for the ones investigating in a *long-run perspective* is that they consider the political consequences of changes in variables that are changed slowly over time.

A major contribution is *A rational theory of the Size of Government* by Meltzer and Richard (1981). Their analysis predicts that “there is more redistribution the more inequality there is in a society²⁷.” The argument is, simplified, that the median voter has an income below the average income, and thus the majority of voters have a common interest in increasing the amount of redistributive policies. However, this prediction has little empirical support²⁸.

Some research has been done on the field of inequality and the demand for welfare spending²⁹. Moene and Wallerstein (2003) extend the model developed by Romer (1975) and Meltzer and Richard (1981) to include social insurance, and not only redistributive policies. Theoretically they show that “a reduction in the income of the median voter has two effects that work in opposite directions:”³⁰ a *price effect* and an *income effect*. With a reduced income, the relative cost of a given level of benefits will decline – and thus the demand for social spending increases. At the same time “a decline in the income of the median voter reduces the amount of insurance [she] wishes to purchase³¹.” They claim that the income effect will dominate the price effect – “which implies that support for [unemployment] benefits (...) declines as inequality increases³².”

Lind (2004) states that “the rich vote conservative – but this is not because they are rich”³³. The explanation given by the Meltzer and Richards model is that rich people should vote conservative³⁴ simply because it is in their economic self interest do to so – since they are rich. Lind argues that this is wrong. He claims that “their preferences for conservative parties and

²⁷ Lind (2004) p. 2

²⁸ Lind (2004) p. 2

²⁹ See Moene and Wallerstein (2001, 2003)

³⁰ Moene and Wallerstein (2003) p. 493

³¹ Moene and Wallerstein (2003) p. 493

³² Moene and Wallerstein (2003) p. 493

³³ Lind (2004), p.2

³⁴ Given that conservative argue in favor of less redistribution.

against redistribution are driven by factors such as social background and learning about economic mechanisms³⁵.”

The variance of the wage distribution³⁶ are typically not fluctuating in the short run, such that their argument can explain the long run behavior of the voters, and can in some sense be seen as a formalization of the traditional sociological model of political behavior.

A different approach, in the branch most relevant for this thesis is the one analyzing short term political fluctuations as a consequence of economic performance. Kramer (1971) is an early contribution of great importance in this field. By using more sophisticated techniques and by presenting an explicit theoretical framework he reopened the field of economic influences on electoral behavior³⁷. Kramer's general conclusion was:

...economic fluctuations are “ important influences on congressional elections, with economic upturn helping congressional candidates of the incumbent party, and economic decline benefiting the opposition”

The most relevant economic variable seems to be real personal income, “with real income held constant, changes in unemployment or in the rate of inflation have no significant independent effects³⁸.” The work of Kramer was strongly criticized by Stigler (1973)³⁹. Stigler (1973) does several modifications of Kramer's estimation methods and concludes that the economy has no effect on voting. The most important difference, important in the way that it changes the results, is that Stigler uses two-year observations instead of regularly yearly observations, such that the economic data corresponds to the congressional term. This makes the significance in the results to disappear. Later contributions seem to have showed that the economy has a significant effect on voting behavior.

The most investigated of hypotheses are those claiming that the economy does influence the reelection probability of the incumbent. Chappell jr. (1990) concludes that his research is consistent with Fair (1978) and Hibbs (1987) stating that GNP growth and inflation seems to matter for both voters and poll respondents in the expected manner, i.e. high growth and low

³⁵ Lind (2004) p. 2

³⁶ They use a log-normal distribution, see Moene and Wallerstein (2001) p. 860.

³⁷ Monroe (1979)

³⁸ Kramer (1971) p. 141

³⁹ Monroe (1979) p. 145

inflation strengthen the support for the incumbent. Chappell find little or no evidence for the effect of unemployment.

In a comprehensive analysis, trying to take account of the nation specific political context, Bingham Powell jr. and Whitten (1993) find that “the support for right-wing governments is enhanced by lower inflation and hurt by higher inflation than the current international standard⁴⁰. Left and center governments were helped by better than average unemployment records and hurt by worse than average unemployment⁴¹.” They include an ideological dimension claiming that the voters expect left wing governments “to deal better with unemployment and short term economic stimulation, while they expect right wing governments to deal better with inflation⁴². Radcliff (1988) uses data for congressional elections in the US in the period 1896-1970, and claims that “fluctuations in the economy had a significant effect upon election results prior to 1960, but not thereafter⁴³.” He finds that after 1959, neither recession nor prosperity significantly affects congressional voting. There are several other contributions to this field as well, but obviously enough, not any clear answers.

The other category of hypotheses, namely the economy’s effect on political preferences along a right-left political dimension⁴⁴, has been investigated by Durr (1993) and Stevenson (2001), but few others it seems. Durr considers US data only and concludes that “expectations of a strong economy result in greater support for liberal domestic policies, whereas anticipation of declining economic conditions pushes the national policy mood to the right.” Durr uses political data from several surveys, as well as data for economic expectations. His methods are sophisticated and his findings are clearly significant. His theoretical arguments however, are in my opinion insufficient and weak.

Stevenson (2001) expands the empirical work in this field, using two separate political datasets combined with economic data from the OECD. Theoretically he leans on Durr’s (1993) arguments. He concludes that “people want policy to move left when the economy is expanding and right when the economy is contracting⁴⁵.”

⁴⁰ International standard is the average in the other countries.

⁴¹ Bingham Powell jr. and Whitten (1993) p. 409-410

⁴² Bingham Powell jr. and Whitten (1993) p. 404

⁴³ Radcliff (1988) p. 449

⁴⁴ See Stevenson (2001)

⁴⁵ Stevenson (2001) p. 632

I return to the works by Durr and Stevenson in detail later, as they are the two most relevant references for my thesis.

III Political business cycle theory

What is the effect of elections on the economy? This is the question asked and answered in Nordhaus' famous paper – The political business cycle (1975). Assuming voters to be naïve⁴⁶ and political parties to be opportunistic⁴⁷, Nordhaus argues that the economic business cycle should follow the elections. If the voters' support for the incumbent increases when the economy prospers, the incumbent has an incentive to increase public spending in the election year. This will create a cyclical economic development that Nordhaus calls the political business cycle.

Nordhaus examines the theory empirically on nine large OECD countries⁴⁸. He finds strong support for the theory in the US, Germany and New Zealand, some support in France and no support in Australia, Canada, Japan, Sweden and UK⁴⁹.

In an epilogue to Nordhaus (1989) Alesina argues in favor of what I call the *partisan political business cycle*. Alesina claims, leaning on three contemporary papers⁵⁰, that “the most common patterns of politico-economic cycles are as follows:

When conservative governments are elected, they tend to take care of inflation, particularly if they have inherited a high inflation rate. After an early recession or slowdown, the economy recovers, often with a relatively low inflation. In accordance with the opportunistic model, these governments do not do anything before the next election to “rock the boat.” When left-wing governments are elected, they try to expand because they care more about unemployment, and this is their mandate from the electorate. They succeed for some time in promoting higher than average growth. Then they often run into an inflation problem and face a Phillips curve becoming steeper and steeper because expectations adjust. As the next election approaches, the economy is returning to some kind of average growth, and inflation is relatively high. At this point, in order to please the electorate and be reelected, left-wing governments may have to fight inflation, which has become the number one cause of concern

Opportunistic behavior for left-wing governments may actually be the opposite of that prescribed by the traditional model [political business cycle theory⁵¹].”

⁴⁶ In the sense that they do not understand the “trick” used by the incumbent.

⁴⁷ Alesina (1989) p. 50, in Nordhaus, Alesina and Schultze 1989

⁴⁸ Australia, Canada, France, Germany, Japan, NZ, Sweden, UK and US, Nordhaus (1975) p. 186

⁴⁹ See table 1 in Nordhaus (1975) p. 186

⁵⁰ Alt (1985), Pladam (1989), Alesina (1989), from Nordhaus et.al (1989) epilogue by Alesina, p. 55

The partisan political business cycle approach presented here by Alesina will is of importance for examining possible causality problems and model specification problems later in this thesis.

⁵¹ In the meaning that political business cycle theory predicts expansionary policies in the year of the election, while Alesina claims that the opposite is the case when a left-wing government is in power.

3. Why and how should the economy influence elections?

On the day of the election, the voter chooses between two or more parties. The voter will either vote for his preferred party, or he will vote tactically⁵². The choice of political party is the result of a consideration based on the voter's information about the parties' policies and his policy preferences.

I will assume voters to vote for their preferred party only, i.e. no tactical voting. I will also assume voters to be well informed in the sense that they are able to identify the political parties, as well as to rank them from left to right on a political left-right axis.

Consequently, the decision of for whom to vote follows *direct* from the voters' preferred policy. I thus assume the influence of the economy on voting to be *indirect*, influencing the vote through the voters' preferred policy⁵³:

economy → preferred policy → vote

The answer to the question of how and why the economy should influence voting behavior is thus to be found in how voters' preferred policy is influenced by the economy.

I have also identified two sources of disturbance; voters lacking information, unable to identify the political parties' position, and tactical voting.

The left-right political axis (LRA) can be identified as the underlying dimension of the political opinion in several separate issues⁵⁴. In an analysis of shifts in policy sentiments in the US, Durr (1993) claims that "the liberal policy agenda has explicitly cited the need for an active federal government as provider and protector of jobs, health care, schools, housing, civil rights and the like." Stevenson (2001) claims the conservative agenda to be the opposite. This dichotomy

⁵² In the sense that he votes for a party being his second-best option, but with a higher probability to be elected, i.e. the democratic candidate in the 2004 elections, John Kerry, probably got support from voters primarily preferring Ralph Nader, but realizing that Nader did not have any chance to be elected.

⁵³ Stevenson (2001) p. 632 uses the term "preferences" instead of "preferred policy". Since what I consider is short term fluctuations' effect on voting I will argue that the *preferences* are unchanged, while the *preferred policy mix* are changed by the economy.

⁵⁴ Stevenson (2001) p. 622

between liberals and conservatives in the US are easily exported to other western democracies⁵⁵, but with different labels. In Europe both liberals and conservatives belong to the right side and socialists constitute the left side. Hence I choose to use the labels *left* and *right*, instead of the American *liberal* and *conservative*. Stevenson also claims that several other sources conclude that citizens' preferences over a whole range of policy issues are "highly correlated with a single left/right dimension"⁵⁶.

Voters' preferred policy is in the sociological model explained in such a manner that short-run economic fluctuations are given no explanatory power⁵⁷. Not much work has been done in this field⁵⁸ and I will try to establish a framework for analyzing this problem before presenting the few arguments used earlier.

A framework for analysis

Do voters have purely *egoistic* preferences or have they *social* preferences? Do voters only care for their own well being, or do they care for the welfare of all citizens? To keep the arguments clear and identifiable, this dichotomy makes it easier to understand and to categorize the arguments, even though voters' in the real world probably have preferences somewhere in between these two extremes.

Are the voters *sophisticated*, fully informed, forward looking and with a perfect memory? Or are they *naïve*, easy to manipulate, and unable of separating cyclical from permanent growth etc.?

Applying this framework yields the following four categories of explanations for how short time economic fluctuations have an impact on elections:

⁵⁵ Stevenson (2001) p. 622

⁵⁶ Stevenson (2001) p.622.

⁵⁷ In the more long-run relationship captured by the sociologic model it is more appropriate to use the term *preferences* since the voters' preferences are assumed to be set by class, social background etc.

⁵⁸ Stevenson (2001) claims that Durr (1993) is the only published paper giving a theoretical explanation for the relationship between economic fluctuations and voting behavior.

<i>Sophisticated with egoistic preferences</i>	<i>Sophisticated with social preferences</i>
<i>Naïve with egoistic preferences</i>	<i>Naïve with social preferences</i>

Table 3.1: A simple framework for analysis.

The arguments

Durr's diminishing return of money

Durr (1993) uses a very simple consumer theory approach to explain how voting behavior is affected by economic fluctuations. He claims that voters have diminishing marginal returns to money. They will therefore increase their sharing with others when their income increases. Then he aggregates this argument and uses it on the nation as a whole⁵⁹:

“A nation with great collective wealth will value money less and will thus be more willing to part with it toward the attainment of other goals. Should money become scarce, however, its value relative to other goods (e.g., the utility gained by contributing to the betterment of strangers) increases. “

He claims that the argument does not rest on the assumption of altruism:

“individuals who support tax-and-spend policies designed to fight poverty may do so not because they are saintly but, rather, because they find the visual reminders of poverty around them particularly unpleasant.”

The political consequences of the arguments follow rather straightforward:

“Given the fact that most liberal policies require a redistribution of wealth, one would expect that in time of economic uncertainty or insecurity, citizens will be less supportive of the liberal domestic policy agenda.”

⁵⁹ All three following quotes are from Durr (1993) p. 159

As Durr points out himself, his argument is valid also with a pure egoistic voter assumption. He also uses a rational, forward looking approach to characterize the voter. Hence Durr’s argument belongs among the *sophisticated egoists*.

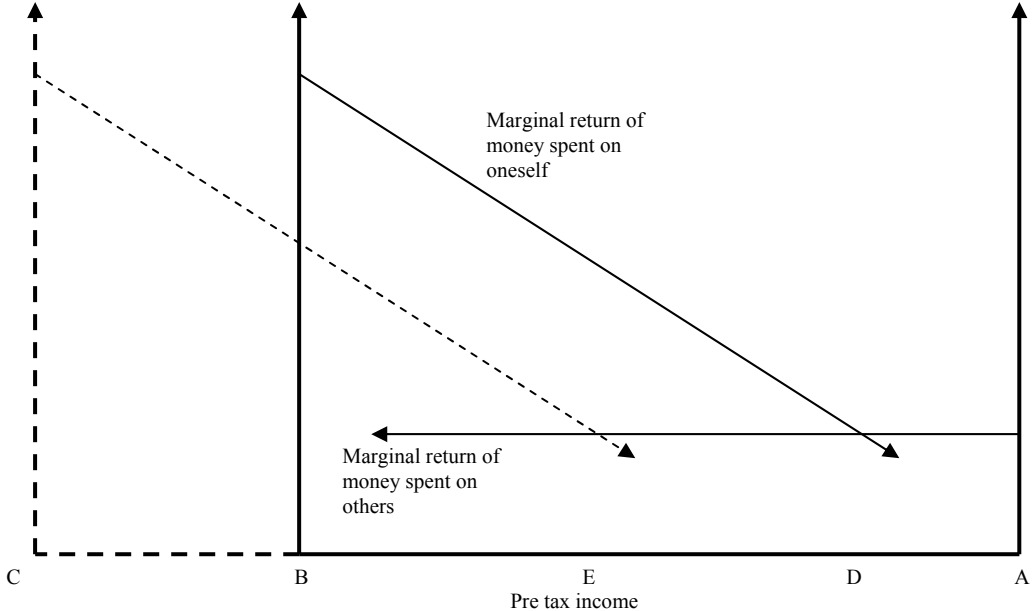


Fig. 3.1: Durr’s diminishing return to money: Consider first a voter’s income to be the line between A and B and his marginal utility of using this income and to spend it on others to be equal at D such that he will prefer to spend BD on herself and “give” AD in taxes. If the voter’s income increases, and now is equal to the line CA, we can see that his preferred tax-rate (AE) is a greater share of his total income (AC) than DA was of AB.

Durr’s hypothesis has obviously several problems explaining voter’s behavior. If Durr’s arguments are taken literally, and everybody has the same preferences, (1) the rich should vote more radical than the poor. (2) The richest countries should have more generous welfare systems and (3) more comprehensive foreign aid programs than others. To my knowledge, this “opposite class struggle” (1) has not been seen anywhere. (2) and (3) is to some extent true over time since countries that grow richer also tend to expand their welfare spending. Even so it is a hard case to argue that the welfare state has developed because the rich has been more generous – because they are rich. The possible “confirmation” of (2) and (3) is thus a spurious relationship and not caused by the arguments presented by Durr.

The demand for social insurance I – when income changes

The arguments and analysis of Moene and Wallerstein (2003) can, slightly modified, give better explanations of the question raised. Since changes in the income distribution are too slow to be relevant in this context, I remove the redistributive policies from the model such that I only consider social insurance policies. To be explicit: this implies that I consider social insurance to be the welfare state's most relevant component in this analysis. Governments spend roughly around 20-25% of GDP on what we usually call the welfare state.⁶⁰

The model I present here is thus a simplified version of the model they use, and it is modified by introducing expected income as the argument in the utility functions. Social insurance is in this model defined as unemployment benefits, and the risk of needing it is the risk of being out of work.

Let w_i^e denote voter i 's expected (future) private wealth after tax. Let B_i denote the unemployment benefits, received when unemployed. Let p_i be the probability of the voter keeping the job in the future, while $(1 - p_i)$ is the probability of losing it.

The agent in the model is the individual voter, trying to maximize his expected utility. The expected utility of voter i is then given by:

$$(1) E(U_i) = V_i = p_i u(w_i^e) + (1 - p_i) u(B_i),^{61}$$

The net income is just the after tax gross income and the unemployment benefits are simplified and set equal to B for all voters.

$$(2) w_i^e = (1 - t)W_i^e$$

$$(3) B_i = B$$

⁶⁰ Moene and Wallerstein (2003), p.485

⁶¹ I do the following assumptions about the utility functions:

$$u(0) = 0, u'(0) = 0, u'(j) > 0, u''(j) < 0 \quad \text{where } j = w_i^e, B_i$$

B^e is financed over the government budget. To keep the analysis simple I let B^e be the only component in this budget. Let γ denote the employment rate and let N be the size of the population. \bar{W}^e denotes the pre tax expected average income while $\tau(t)$ is the net tax function of the government. For each actual tax rate it gives the effective tax rate received by the government. An increasing dead weight loss from taxation is then given by the following assumptions: $\tau'(t) > 0, \tau''(t) < 0$. The budget then becomes:

$$(4) \quad \tau(t)\gamma\bar{W}^e N = (1-\gamma)NB^e \Leftrightarrow B^e = \tau(t)\frac{\gamma}{1-\gamma}\bar{W}^e$$

Inserting (2) and the expression for B from (4) into (1) gives the following expression for the expected utility of voter i :

$$(1') \quad V_i = p_i u((1-t)W_i^e) + (1-p_i)u\left(\tau(t)\frac{\gamma}{1-\gamma}\bar{W}^e\right)$$

By maximizing the expected utility of voter i with respect to the tax rate, and then differentiating the first order condition with respect to the wage and the tax rate I get the following result:

$$(5) \quad \frac{dt}{dW_i^e} > 0$$

The desired tax rate increases as the income increases, or the demand for insurance increases with an increase in income, all other equal. The proof for this is found in the appendix.

The result follows from the assumption of insurance being a normal good. In the analysis, social insurance is provided by the public sector. The amount of insurance (i.e. the level, from zero to fully insured) depends on the tax rate. An increase in income and an unchanged tax rate means that the amount of insurance is unchanged as well (i.e. 60% of income). Hence to increase the amount of insurance (i.e. to 70% of income) the voter has to pay higher taxes.

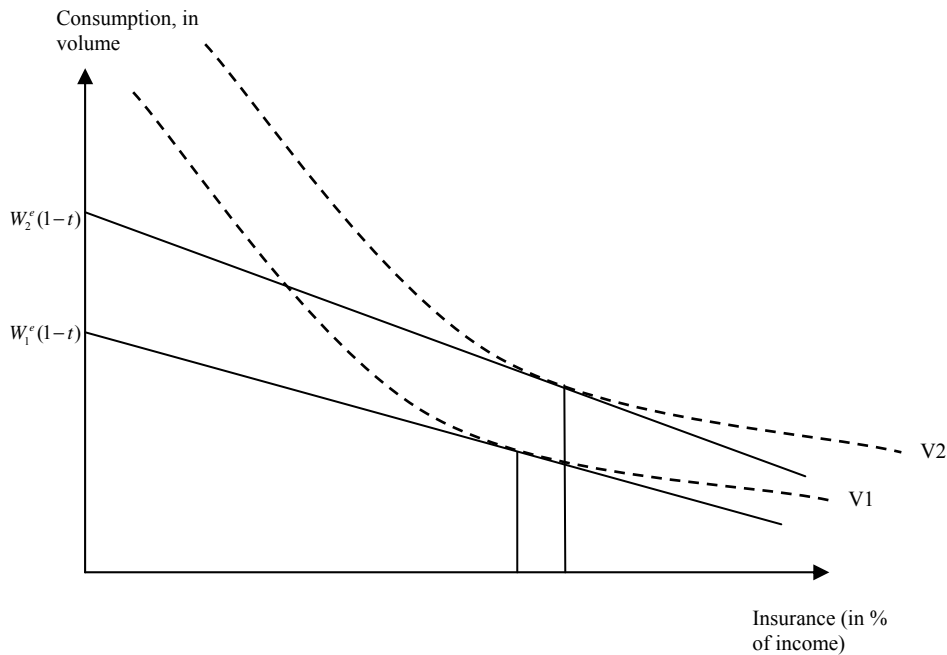


Fig. 3.2: Increased demand for insurance with income: The graph shows the voter's indifference curves between consumption and income, and thus how the preferred amount of insurance increases when the income rises. The tax rate increases as the amount of insurance increases. This makes the upper budget line steeper than the lower, since the increase in income available for consumption depends on the amount of insurance bought (i.e. the tax rate). This increased steepness is the price effect and pulls the tangency point to the left in the diagram – towards less insurance. The increase in income, pulls the tangency points along the “substitutum” (i.e. the line connecting all the tangency points) to the right in the diagram – towards right in the diagram. This is the income effect. The argument rests on that the income effect dominates the price effect.

Is this argument relevant for all voters? Clearly it is not. The poor, receiving barely a minimum needed for existence, will not be able to pay for insurance at all. The rich, able to insure themselves using own capital income, will not need social insurance in case they are unemployed, and they will (in general) experience to pay far more taxes than what they can expect to have in return. The middle class, however, can afford to pay for insurance, but are not rich enough to be self-sufficient in case of emergency. Hence, the argument should be valid over a certain range of the income distribution – the middle class.

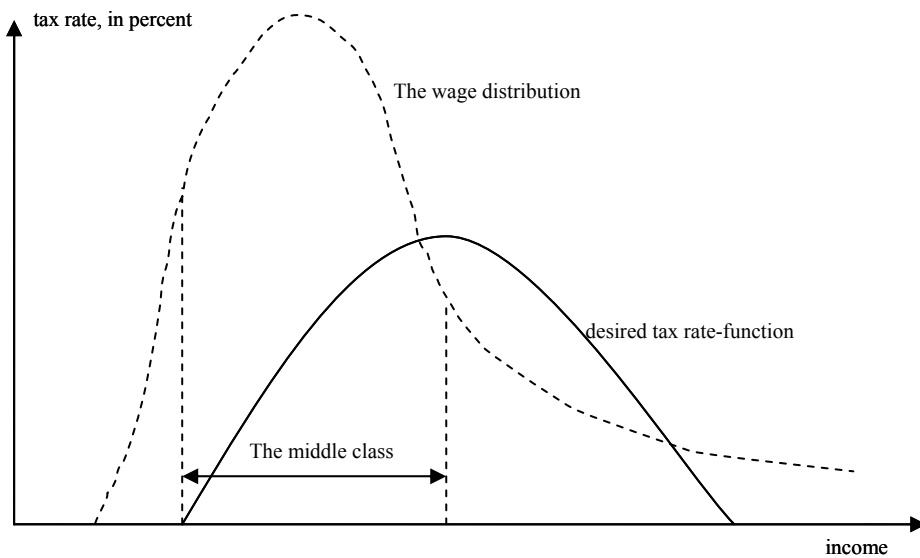


Fig. 3.3: The middle class' desired tax rate function: When the income rises, the middle class desire more social insurance for a constant risk of losing one's job, and thus accepts to pay higher taxes. From the wage distribution we can see that the median voter belongs to the middle class.

If the income distribution was uniform, the figure above should indicate that just as many voters should desire higher as lower taxes. However, in most countries the income distribution is far from uniform. Moene and Wallerstein use the log-normal wage distribution which is skewed to the left, implying that the median voter has an income below the average income. If this is the case, it is not unrealistic to assume that the median voter in the OECD countries is situated somewhere on the rising part of the “desired tax rate-graph”.

Since social insurance is an important component of western welfare states this mechanism should have an impact on the voters' general policy preferences.

How is this connected to short time fluctuations in the economic performance? Increased economic growth leads to an increase in the voters' expected income. If so, fluctuating economic growth should lead to a fluctuating demand for social insurance, and consequently lead to a fluctuating voting behavior along the LRA. If voters are sophisticated they will only adjust their expected income if the real economic growth increases. Naive voters will adjust their expected income even by a change in the nominal economic growth rate. The political impact of this predicted mechanism is the same as predicted by Durr – an expanding economy leads to greater support for higher tax rates and thus left policies, and a contracting economy leads to greater support for tax cuts and thus right policies.

The demand for social insurance II – when the risk of being out of job changes

The social insurance argument has another dimension, not considered by Moene and Wallerstein⁶², namely that the demand for insurance also has to be influenced by the amount of risk faced by the voters.

By using the exact same methods and same equations as above I find that the desired tax rate decreases when the risk of keeping the job increases, or that the demand for insurance increases when the probability of loosing one's job increases.

$$(6) \frac{dt}{dp_i} < 0$$

See appendix for proof.

The risk of the voter loosing his job is on micro level highly individual, but on aggregate level it is reasonable to believe it to be highly correlated with the development of the unemployment rate.

Just as we expect the demand⁶³ for fire insurance to increase with the number of fires in the neighborhood, the demand for social insurance should increase when the unemployment rate rises. If so we have two, to some extent, conflicting arguments: the demand for insurance shall increase with economic growth and with an increased unemployment rate. But, the unemployment rate and economic growth should according to standard theory⁶⁴ be negatively correlated.

If we recapitulate the consumer's choice diagram from above, the change in risk "rotates" the indifference curves, since the voter's utility of the two "goods" in (1) are weighted with the risk rate.

⁶² I believe because it was not relevant in their analysis, since they considered a long run relationship.

⁶³ Or the marginal willingness to pay for fire insurance, to be precise.

⁶⁴ Consider for example a Phillips curve model.

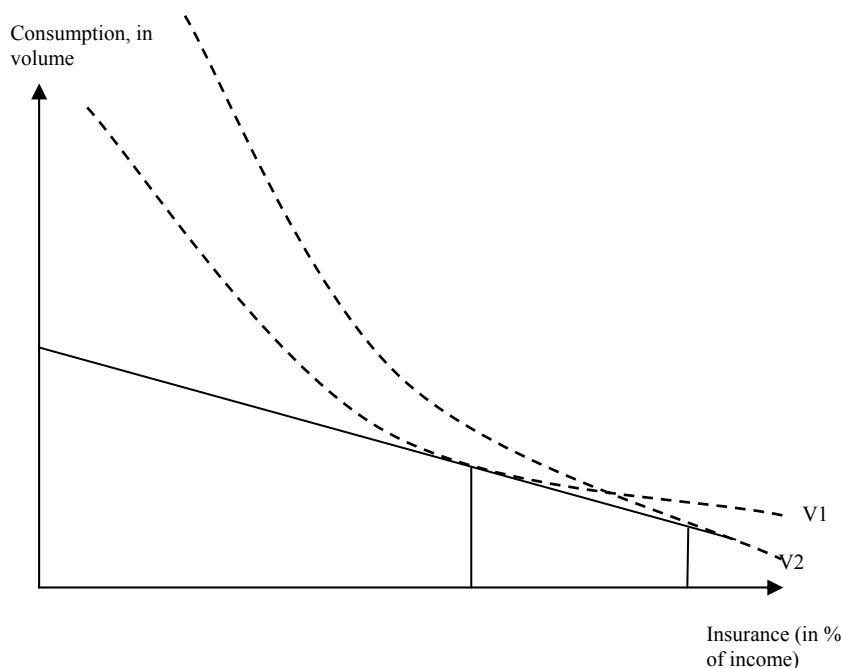


Fig. 3.4: Increased demand for insurance with increased risk: The indifference curves “rotate” clockwise when the risk of losing one’s job increases. This increases the voters demand for social insurance.

The demand for social insurance III – the lack of willingness to pay for other’s unemployment

When arguing that an increase in unemployment should increase the demand for social insurance it is necessary to make a distinction between an *increase* in unemployment and a high unemployment rate as such. The distinction builds on a classic decisions-under-uncertainty argument: When the unemployment suddenly increases, this signals the start of a recession. At this point “everyone” faces an increased risk of losing their job. This increases the demand for insurance.

On the other hand, a high unemployment rate as such, will have the opposite effect on the demand for social insurance. When the unemployment rate has reached its peak we are at the bottom of the recession. The uncertainty related to who would lose their job is now gone. Those who kept their job will have a lower willingness to pay for others’ unemployment benefits. Their willingness to pay taxes is therefore lower. This explains why the demand for social insurance is negatively correlated with the level of the unemployment rate.

The distinction is nicely captured by John Rawls' "veil of ignorance" from "A theory of Justice" (1971). At the beginning of the recession, the uncertainty makes the risk averse agents demand more insurance – or more equality according to Rawls – but when the veil is lifted, the majority, still in work, will benefit from not paying for the public redistribution policies. The function of unemployment benefits hence changes within the business cycle: at first it provides insurance for everyone, reducing the (shared) uncertainty. Thereafter, when the cards are drawn it acts as a mechanism of redistribution. This explains its seemingly inconsistent effect on policy demand.

The demand for social insurance IV – bringing the perspectives together

In the analyses I have argued that economic fluctuations should influence the demand for social security, and hence change the voters' preferred policies.

Consider a voter, working in a private enterprise. When the economy booms, he would – all other things equal – prefer to pay for an increase in his social insurance, i.e. unemployment benefits. At the same time, he would experience that his job is more secure than before, and this will reduce his desire for paying more taxes.

How is then the voter's subjective opinion on the risk of ending up on the dole influenced by the tax rate? It is obvious that his judgment is influenced both by *micro factors* – as his company's surplus, own skills and effort etc. – and *macro factors* such as unemployment, growth rates, interest rates etc. More interesting is the voter's experienced risk of being out of work, which is probably influenced by the outcome of the election.

Once again consider the voter working in a private enterprise. This time we let the economy face a recession. The voter should desire to use a lower share of his income on taxes – simply because he cannot afford to buy as much insurance as before. On the other side, the macro factors described, influences the voter's notion of the risk of losing his job such that this will increase his insurance demand. However, will not the voter also realize that higher taxes (i.e. business taxes) will add to the increased risk of being unemployed? On the other hand: if the voter instead works in the public sector, increased taxes should secure – not threaten – his future employment. The distribution of middle class workers (i.e. *voters*) should then influence the claim set out in (6). A majority of the electorate working in the public sector should strengthen the claim and vice versa with a majority working in the private sector. Considering the growth of the public

sector's share of GDP in most western countries, also in the period 1950's to the 90's, this should imply that the claim in (6) is gradually strengthened over this period.

Hence these theoretical arguments are both conflicting – in the sense that unemployment and growth are negatively correlated – and blurred by a relationship between the experienced risk of losing one's job and the outcome of the election.

I have in this section presented the following arguments:

The demand for left policies should:

...be positively correlated with economic growth because higher growth leads voters to expect higher income, hence they demand more social insurance.

...be positively correlated with an increase in the unemployment rate because the probability of needing social insurance increases.

...be negatively correlated with the actual unemployment rate because the willingness to pay for unemployment benefits shrinks when the (acute) loss of losing one's job is no longer present.

4. The political equilibrium model

A synthesis of the long-run “sociological model” and the short-run “fluctuations model” can be obtained by a political equilibrium model. The sociological model explains policy demand from factors such as culture, religion, demography, wealth, inequality, education, openness, foreign security etc. Holding macroeconomic performance constant, the median voter’s position will be determined by these factors. I will call this position *the political equilibrium*. I expect this equilibrium to move slowly over time, since the variables constituting it are slow moving variables.

Short-run economic fluctuations cause policy demand to fluctuate around its equilibrium level. Such fluctuations are caused by changes in economic growth and unemployment. Let y_t denote the median voter’s position at time t . Let \mathbf{X} be a matrix containing relevant sociologic variables, g_t economic growth and u_t the unemployment rate. Let their equilibrium levels be denoted by $*$. The general political equilibrium model to be estimated will thus be:

$$(12) \quad y_t = \mathbf{X}\beta + \gamma_g (g_t - g^*) + \gamma_u (u_t - u^*)$$

Two possible formulations

Are voters naïve or sophisticated in their perception of the economy? Are voters able to identify trend or equilibrium levels of the economic variables? In the literature we can find several formulations concerning voters’ rationality, from those claiming voters are able to distinguish between real and nominal growth to those considering voters to be easily manipulated. The assumptions made on voters’ rationality are crucial for defining the equilibrium levels of growth and unemployment in (12). In accordance with the theoretical arguments stated in chapter 3 I will try to investigate voters’ response both to the level of and the change in economic growth- and the unemployment rate. The response to their levels will be estimated with the “level model” and the response to their pre-election change will be estimated with the “acceleration model”:

The level model:

$$(13) \quad y_t = \mathbf{X}\beta + \gamma_g g_t + \gamma_u u_t$$

The acceleration model:

$$(14) \ y_t = \mathbf{X}\beta + \gamma_g (g_t - g_{t-1}) + \gamma_u (u_t - u_{t-1})$$

Investigating the different formulations

The different model formulations can easily be illustrated in a diagram. By using the real growth rates and unemployment data for Australia in the period 1950-2004 I have illustrated both the idea with the political equilibrium and the difference between the two formulations⁶⁵.

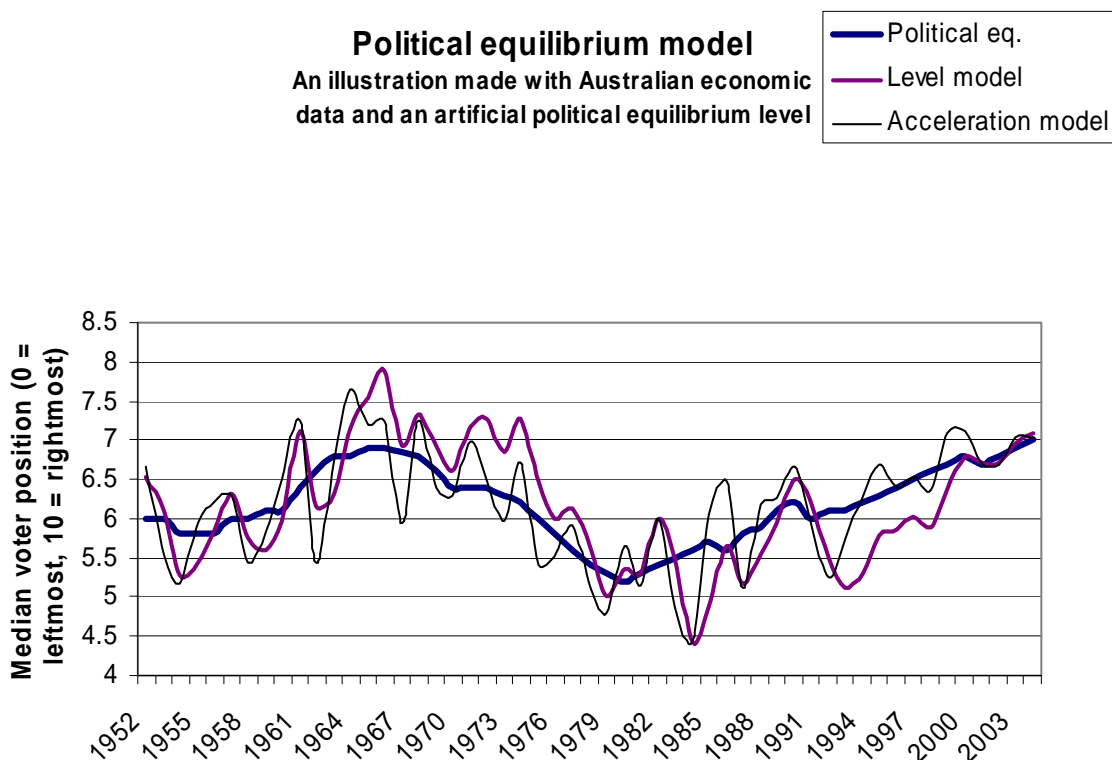


Fig. 4.1: The political equilibrium model, estimated for Australia using economic data and an artificial political equilibrium level.

Both the acceleration model and the level model construct a fluctuating prediction around a slowly changing political equilibrium level. To investigate the statistical properties of the two models I first set the political equilibrium level constant, such that the correlation between the two models are not driven by the fact that they both share a common trend. The correlation between the two de-trended models are equal to 0,47 and the variance seems to be slightly higher in the level model.

⁶⁵ The unemployment data before 1964 are missing and are thus simply set like the average in the whole sample – 6%. The changing political equilibrium is not estimated, but simply artificial made to illustrate the features of the model. The gammas are each set to -20.

5. Data

Measuring policy demand

Durr (1993) uses a policy measure developed by Stimson (2001) which consists of a “single time series of public opinion data based upon hundreds of distinct survey marginals”⁶⁶. He regresses this policy measure on a business expectations measure stripped for policy expectations⁶⁷. Stevenson (2001) uses two separate measures of what he calls *policy mood*. He obtains the strongest results when he uses *Eurobarometer* data as a proxy for the median voter’s position on the left – right axis. These are survey data, collected every six months in all European Union countries. The respondents are asked to identify their position on a left – right axis between 1 and 10. Stevenson also uses election results weighted for the parties’ position on the left – right axis⁶⁸. He interpolates the data between elections such that he can estimate the model for all years, not only those containing an election.

The estimation procedures used by Durr (1993) and Stevenson (2001) are thus quite different from the procedures used in this thesis. Even in modern “media politics”, elections – not opinion polls – govern countries. In an opinion poll voters can protest against the incumbent by “threatening” to cast their vote for the opposition. There is also a possible causality problem related to the use of survey data in between elections. If the support for the incumbent increases with increased growth and Alesina is right in his description of the *partisan political business cycles*, a newly elected left incumbent will increase its’ support in the following years after the election since growth is boosted by expansionary policies. This may create *spurious* support for the hypothesis when inter-election data from surveys are used, as in Stevenson (2001).

To measure policy demand I have used two separate datasets, resulting in totally 7 different political indicators. The simplest and most transparent indicator is based on a dataset provided by Duane Swank, covering 21 OECD countries in the period 1950-1999. The data set contains the share of the total vote received by the party groups *left*, *right*, *center* and *Christian democrat* in the period and countries covered. From these data I have constructed a simple indicator $pol = right - left$

⁶⁶ Durr (1993), p.160

⁶⁷ The method is quite complex, but is described in Durr (1993) 160-162

⁶⁸ Kim and Fording (1998): “Voter Ideology in Western Democracies, 1946-1989”, *European Journal of Political research* 33:73-97.

The center and Christian democratic parties are kept out of the indicator. These parties are not possible to include consequently at either of the sides. The indicator will be in the interval between -100 and 100, where -100 signify that all the votes are received by left parties. A more detailed description of the construction of this indicator is found in the appendix.

A problem with this simple indicator is that it does not account for the fact that political parties' position on the left – right axis also moves over time. Hence an identical election result in two following elections will be interpreted as a constant policy demand. This may be misleading if the parties have repositioned themselves on the left – right axis. The median voter may thus have changed his position. This is not captured with this simple indicator. Consequently, the only way this indicator will indicate a change is when the electoral outcome – the distribution of votes among the different political parties – has changed from one election to another. This is both the strength and the weakness of this indicator. We know what the changes originate from, but we cannot observe the *real political shifts* underlying it.

The other set of indicators are based on the Kim-Fording methodology and are provided by Michael D. McDonald⁶⁹. The methodology used to construct these indicators gives a solution to the problem described above – the difficulty of observing the real political shifts underlying a change in electoral outcome. Instead of describing the distribution of voters over the political parties directly, the Kim-Fording methodology is a technique where both the *distribution* of voters over the political parties and the actual *position* of these parties on the left right axis are included. If one lets the parties as well as the voters move on the left right axis between elections, the indicated change showed by the indicators will indicate a real political change in the country. This is a major advantage of these indicators. The drawback is that we do not know whether the change originates from a change in the electoral outcome or a change in the political parties' programs. Since the position of the political axis has to be determined manually and is highly subjective, there is also a danger of systematic measurement errors. While the simple indicator is highly transparent, an indicator where both parties and voters move between elections is the opposite.

The dataset covers 21 countries at each constitutionally based election from 1950 through 1995. There are six different indicators in the dataset. Their variations arise from differences with

⁶⁹ This description of the six indicators leans heavily on McDonalds codebook.

respect to two assumptions: (1) the left-right position of parties at the time of an election, and (2) the distribution of voters who are to the left of the left-most party or to the right of the right-most party. To calculate the median voter position, McDonald uses a formula for computing a median from grouped data applied to this use and originally provided by Kim and Fording⁷⁰, and found in the appendix.

The six indicators, called *mdnvotr1* – *mdnvotr6*, can be described as follows:

- mdnvotr1* Uses election-specific party position and Kim-Fording assumption about the distribution of voters.
- mdnvotr2* Uses three-election moving average party position and Kim Fording assumption about the distribution of voters.
- mdnvotr3* Uses post-war average party position and Kim-Fording assumption about the distribution of voters.
- mdnvotr4* Uses election-specific party position and adjusted Kim-Fording assumption about the distribution of voters.
- mdnvotr5* Uses three-election moving average party position and adjusted Kim Fording assumption about the distribution of voters.
- menvotr6* Uses post-war average party position and adjusted Kim-Fording assumption about the distribution of voters.

We see that the indicators differ in how fast the political parties are moving along the left-right axis. *Mdnvotr1* and *mdnvotr4* has fast-moving parties, *mdnvotr2* and *mdnvotr5* has slow-moving parties and *mdnvotr3* and *mdnvotr6* uses political parties with a constant left-right position. For the forthcoming analysis it is useful to group all 7 indicators in the following way:

- Dynamic: *mdnvotr1* and *mdnvotr4*
- Semi-Dynamic: *mdnvotr2* and *mdnvotr5*
- Static: *pol*, *mdnvotr3* and *mdnvotr6*

The political indicators can be summarized in the following table. Only *pol* and *mdnvotr1* are listed below. *Mdnvotr1* and *mdnvotr3-6* have averages and standard deviations very similar to *mdnvotr2*.

⁷⁰ McDonald, Median Voters, 1950-1995, Codebook, August 2002 version.

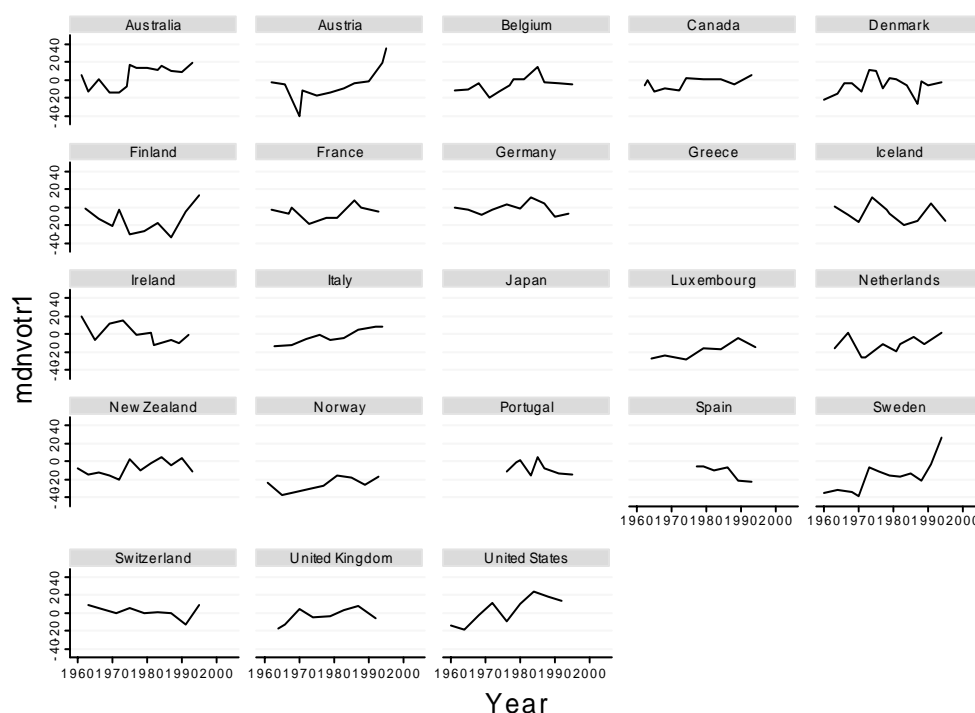
Country	Number of elections	Pol Average (st.dev)	Mdnvotr2 ⁷¹ Average (st.dev)	Quarterly Growth Average (st.dev)	Quarterly Unemployment Average (st.dev)	Missing data
Australia	14	4,3 (6,3)	4,2 (10,8)	0,009 (0,01)	0,06 (0,03)	
Austria	11	-38,6 (9,1)	-4,6 (14,2)		0,03 (0,02)	Quarterly growth
Belgium	12	-7,3 (7,1)	-4,8 (7,0)	0,007 (0,008)	0,06 (0,03)	
Canada	11	25,1 (8,3)	-3,7 (5,4)	0,009 (0,009)	0,08 (0,02)	
Denmark	15	-7,4 (4,8)	-6,0 (8,3)	0,005 (0,01)	0,04 (0,03)	
Finland	10	-22,7 (6,9)	-15,0 (6,1)	0,008 (0,01)	0,06 (0,04)	
France	9	2,3 (9,6)	-7,4 (7,3)	0,007 (0,01)	0,07 (0,04)	
Germany	10	3,5 (7,1)	0,8 (5,3)	0,007 (0,01)	0,04 (0,03)	
Greece	8	-2,7 (18,5)		0,01 (0,03)		Mdnvotr1-6 unemployment
Iceland	10		-2,1 (3,9)	0,01 (0,01)	0,02 (0,01)	Swank data
Ireland	10	60,9 (9,0)	5,3 (12,0)	0,01 (0,01)	0,09 (0,04)	
Italy	9	-26,6 (18,8)	-2,9 (7,4)	0,008 (0,01)	0,07 (0,03)	
Japan	13	17,6 (12,9)		0,01 (0,01)	0,02 (0,01)	Mdnvotr1-6
Luxembourg	7		-16,9 (5,7)	0,01 (0,01)	0,02 (0,01)	Swank data
Netherlands	10	-6,6 (7,6)	-10,9 (4,1)	0,007 (0,01)	0,05 (0,02)	
New Zealand	12	0,2 (6,1)	-7,9 (8,2)	0,007 (0,04)	0,03 (0,03)	
Norway	9	-21,4 (9,3)	-25,3 (6,6)	0,009 (0,02)	0,03 (0,01)	
Portugal	8	-38,7 (8,8)	-1,1 (24,8)	0,01 (0,01)	0,05 (0,02)	
Spain	6	-8,9 (6,7)	-11,8 (4,3)	0,01 (0,009)	0,09 (0,06)	
Sweden	12	-32,5 (5,7)	-20,5 (11,7)	0,007 (0,01)	0,03 (0,02)	
Switzerland	9	-0,9 (3,0)	3,6 (6,3)	0,004 (0,01)	0,01 (0,01)	

⁷¹ Mdnvotr2 = median voter indicator # 2. The dataset contains 6 different indicators for the position of the median voter. See above for a presentation of these indicators.

UK	8	3,5 (7,1)	-8,3 (7,7)	0,006 (0,01)	0,05 (0,03)
US	9	45,6 (2,6)	3,2 (15,0)	0,008 (0,009)	0,06 (0,01)

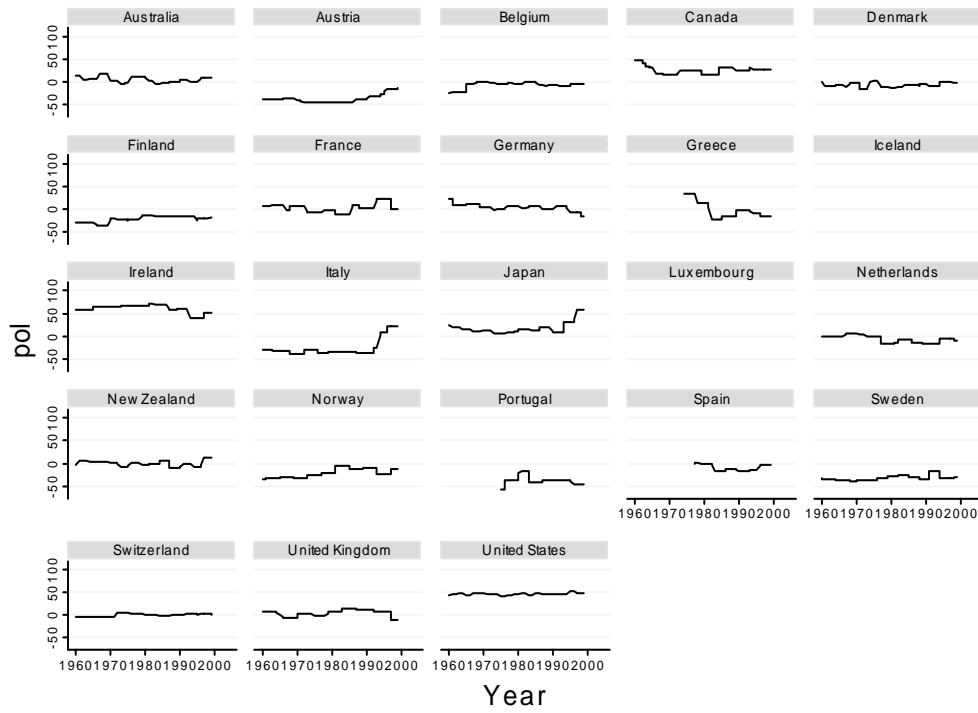
Table 5.1: A brief summary of the political indicators, and the economic data used for estimation. The two political indicators are only two out of seven indicators used in the estimation. Both *mdnvotr1* and *pol* is inside the interval of -100 to 100, where -100 is most left and 100 is most right. The average and the standard deviations gives thus a intuition of the political differences between the countries. The economic data is quarterly data for OECD.

A visual inspection can also be helpful in the process of getting familiar with the data. Below I have plotted both *pol* and *mdnvotr1* over time for all countries:



Graphs by Country

Fig. 5.1: The development over time of the political indicator *mdnvotr1* is illustrated for all countries. The indicator is missing for Japan and Greece. The indicator is made by first finding each party's localization on the political axis and then use these as weights the on outcome of the election. Finally the median voters position is calculated.



Graphs by Country

Fig. 5.2: The development over time of the political indicator *pol* is illustrated for all countries. The indicator is missing for Luxembourg and Iceland. This indicator is only based on the outcome of elections.

A drawback of all seven indicators is that they are only two-dimensional. Phenomenon like political polarization and several political dimensions others than left-right etc. will not be investigated when using these data.

Measuring economic fluctuations

To measure economic fluctuations I use quarterly economic data from OECD for the time period from 1960 to today. I have chosen to use quarterly data to be able to measure the fluctuations present at the time of the election, since elections are held at different times of the year. The most important variables are unemployment and growth in real GDP. All the data used are easily available from the OECD.

Measuring structural relations and the political equilibrium

Several variables are used to estimate the political equilibrium, or in other words; to take account for country-specific effects. The variables I have used are religion, education, immigration, pre-tax inequality, size of population between 15 and 64 years, openness to trade, life expectancy,

share of self-employed workers, union density and bargaining coverage. All these variables are not available for the whole period. I use these variables to determine long-run relationships, trends and country-specific effects. I have both interpolated and extrapolated these data to cover the whole period. Since these variables are changed slowly over time, including these variables can reduce the need for country-specific constants.

6. Results

A benchmark

As a benchmark I will estimate the political equilibrium model presented in chapter 4, using Ordinary Least Squares (OLS). If the standard assumptions for OLS are fulfilled this gives an unbiased and efficient estimate of the coefficients⁷². I choose to use the indicator *mdnvotr2*, which is built on an assumption of semi-dynamic parties, moving slowly from election to election. There are good reasons to believe that political parties move slowly along the-left right axis over time, and indeed *slower* than the voters. Office-seeking politicians will seek to adjust their supplied bundle of policies in order to attract voters. The members of the political parties should be influenced by a fluctuating economy as well as other people, but *slower*, since they carry an ideological and historical heritage as well. A simple OLS estimation of the level and acceleration model, using *mdnvotr2*, real growth, and unemployment, as well as the sociological variables, gives the following result. The models estimated are:

The level model:

$$(13') \text{mdnvotr2}_{i,t} = \alpha + \mathbf{X}\beta + \gamma_g (\text{real growth})_{i,t} + \gamma_u (\text{unemployment})_{i,t} + u_{i,t}$$

The acceleration model:

$$(14') \text{mdnvotr2}_{i,t} = \alpha + \mathbf{X}\beta + \gamma_g (\Delta \text{real growth})_{i,t} + \gamma_u (\Delta \text{unemployment})_{i,t} + u_{i,t}$$

Where the subscript *i* indicates country, the subscript *t* indicates year, and $\Delta x = x_t - x_{t-1}$.

⁷² See e.g. Greene (2003), p.10.

Results 1: OLS estimation of the level and acceleration model using the indicator *mdnvotr2*

The political indicator *mdnvotr2* regressed on real growth, unemployment and the sociological variable matrix using Ordinary Least Squares estimation. 134 elections between 1960 and 1995 are used for estimation. Positive coefficients move policy demand towards right.

Mdnvotr2	The level model		The acceleration model	
	<i>Coefficient</i>	<i>t-value</i>	<i>Coefficient</i>	<i>t-value</i>
Unemployment	80,31**	2,23	Change in unemployment from last quarter	223,20 0,80
Real growth	-90,86	-1,56	Change in real growth from last quarter	-41,97 -0,87
Openness	-24,99***	-2,74	Openness	-28,30*** -3,08
Religion	0,156*	1,84	Religion	0,23*** 2,98
Education	0,06	0,29	Education	0,22 1,02
Life expectancy	0,38	0,63	Life expectancy	1,29*** 2,80
Self employment	-9,76	-0,38	Self employment	-14,40 -0,55
Exchange rate	-1,43**	-2,36	Exchange rate	-1,96*** -3,36
Immigration	67900570***	5,69	Immigration	6188976*** 5,29
Union density	-0,06	-0,83	Union density	-0,05 -0,61
Collective bargaining coverage	0,11	1,28	Collective bargaining coverage	0,15* 1,84
Inequality	57,08**	2,31	Inequality	66,15*** 2,64
Pop between 15-64	0,00094**	2,50	Pop between 15-64	0,00097** 2,53
Constant	-75,37	-1,55	Constant	-150,21*** -4,15
Number of obs:	134		Number of obs:	134
F(13,120):	11,78		F(13,120):	10,81
R-squared:	0,56		R-squared:	0,54

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

These preliminary results indicate that high unemployment increases demand for right policies, while high economic growth seems to work in the other way. The effect of the pre-election change in growth and unemployment seems to be the same as for the actual levels, but the coefficients are far from significant. Of the significant coefficients estimated for the sociological variables openness and the exchange rate – measured as number of local currency per USD – pull the policy demand towards left, while religion, education, life expectancy, immigration,

inequality and size of population between 15 and 64 years push the policy demand to the right⁷³. There are several other variables that ideally should be included, such as wealth at the beginning of the period, welfare systems etc. With better data the estimation could be more precise. Since the sociological variables are the result of both inter- and extrapolation, and are as well outside the aim of this thesis, I will not put any more weight on the estimated coefficients corresponding to these variables. I will however use them to capture country-specific effects over time in the estimations.

The number of elections is, due to missing sociological data, reduced to 134. To investigate the relationship between policy demand and economic fluctuations I also estimate the level and the acceleration model using OLS and the economic variables only. The estimations are then based on 188 elections, and give the following results:

Results 2: OLS estimation of the level and the acceleration model, without the sociological variables

The political indicator *mdnvotr2* regressed on real growth and unemployment using Ordinary Least Squares estimation. 188 elections in the period between 1960 and 1995 are used for estimation. Positive coefficients move policy demand towards right.

Mdnvotr2	The level model		The acceleration model	
	<i>Coefficient</i>	<i>t-value</i>	<i>Coefficient</i>	<i>t-value</i>
Unemployment	92,07***	4,10	Change in unemployment from last quarter	243,49 0,81
Real growth	-141,57**	-2,24	Change in real growth from last quarter	-47,42 -1,01
Constant	-9,40***	-6,30	Constant	-5,95*** -6,56
Number of obs:	188		Number of obs:	188
F(13,120):	11,16		F(13,120):	0,89
R-squared:	0,11		R-squared:	0,0096

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

Compared with the full model above, the coefficients have the same signs, are generally larger, and more significant. There are at least three reasons for this: (1) The number of observations are higher. (2) The degrees of freedom are higher, also because there is less coefficients to be

⁷³ The effect of inequality is yet another confirmation of a well known paradox. The prediction of the Meltzer and Richards model (1981) is that the more pre tax inequality the more radical should the vote be. Empirically it seems like the relation is opposite, and so also here.

estimated. (3) It might be some collinearity between the economic and the sociologic variables. This makes the sociological variables “steal” significance from the economic variables. Note that the acceleration model is not significant on an F-test. It performs poorly – explaining less than 1% of the variation in *mdnvotr2*.

Panel data estimation

In contrast to the estimation done by Stevenson (2001), who interpolates the median voter position between elections, the estimations above should not suffer from an exogeneity problem. With quarterly economic data, the winner of the election is not able to influence the economic performance used to explain the outcome of the same election. Hence the exogeneity condition should be fulfilled, and the variables used to explain the variation in the political indicator should be independent.

According to Wilson and Butler (2004) estimations done by OLS in a pooled data set can give wrong results, even with opposite signs. The reason is that the different units (here: countries) can have the same slope, but with different intercepts. The common solution to this is to assign a constant that varies between - but not within - each unit. This gives the following model, called the fixed effects model (FE):

$$(12') y_{it} = \alpha + \delta_i + \mathbf{X}\beta_i + \gamma_1 G_{it} + \gamma_2 U_{it} + e_{it}$$

The model can be estimated using OLS either by including a dummy for each country or by subtracting the country-specific means from each observation⁷⁴. The use of the fixed effects model has two major drawbacks: The first is that the inclusion of group specific dummies reduces the degrees of freedom and thus the efficiency of the estimate. The other is that all time invariant variables used will be wiped out because of the country-specific dummies. Even though the sociological variables are not completely time-invariant, this may reduce the information given by the sociological variables.

Another way to overcome the need for country-specific effects is by using the random effects model, which is slightly more complicated. The model is designed to overcome the drawbacks of the fixed effects model. It produces a more efficient estimator of the slope coefficients, and it

⁷⁴ Wilson and Butler (2004), p.7

does not wipe out the explanatory power of time-invariant variables. The flip side of the coin is that it may produce a biased estimate if the composite disturbance term is correlated with the explanatory variables.

The inclusion of the long-run, sociological variables, are precisely to explain the variation *between* the countries in the sample. The economic variables – and obviously the slow changes in the sociological variables – are supposed to explain the variation *within* each country. The need for country-specific intercepts can thus be understood as a result of one or several omitted variables in the sociological variable matrix. Since there is a well of relevant variables omitted from this regression, such as historical matters, politicians' reputation, electoral system etc., the need for country-specific intercepts are to be expected.

According to Greene (2003, p.298) an appropriate test for whether or not to include group specific intercepts is the Breusch & Pagan Lagrange multiplier test. The test is performed by first doing a random effects estimation of the model, and then testing if the variance of the intercept component of the composite error term is equal to zero. The test is easily performed in STATA. The null hypothesis is that the variance of the intercept term is equal to zero. The test-statistic is chi-square distributed with one degree of freedom. Running this test on the regressions above gives test statistics well below the critical value of 3,84. The test indicates that country-specific effects are not significant⁷⁵. However, based on the reasoning above, it seems unlikely that all country-specific effects are captured by the sociological variables. The reason for the result from the Breusch & Pagan test may be that the RE-model is not appropriate⁷⁶.

Hence there is need for another test. By running a fixed effects regression, STATA provides an F-test, testing whether the country-specific constants are significant or not. The test-statistic is 5,62 and 5,74, proving the need for including country-specific intercepts.

An important assumption for the OLS estimator to be the best linear unbiased estimator is that the disturbances are “uncorrelated with each other and that they have a constant variance”⁷⁷. If the disturbances are heteroskedastic they have different variances. If the disturbances in some

⁷⁵ The test statistic for the level model were 2,21 and for the acceleration model 2,57.

⁷⁶ From theory the random effects model builds on the assumption that the intercepts are drawn randomly from a larger universe. This is clearly not the case since the number of OECD countries is finite and the countries considered are the consequence of available data, not a random draw.

⁷⁷ Greene (2003), p. 191

way are correlated with each other over time, e.g. from one year to the next, we have autocorrelated disturbances. Both problems are common in a panel-data analysis. The consequence for the OLS estimator is, generally, a loss of efficiency.

To test for heteroskedasticity between countries I use a likelihood ratio (LR) test provided by STATA⁷⁸. The test is based on estimation of the same model, with and without the presence of heteroskedasticity. You then make a comparison of the two estimators' fit on the real data. The test statistic is chi squared with 13 degrees of freedom. The test statistics reported for the level and the acceleration model is 81,5 and 39,86 respectively - far above the critical value of 22,36. Consequently, there is a serious problem with heteroskedasticity between countries in the two regressions. This leads us to a difficult choice of estimators, depending on the assumptions made concerning the nature of the heteroskedasticity. If the disturbance's variance is different between countries, but constant within each country, the model can be estimated efficiently using Feasible Generalized Least Squares. However, if this assumption is wrong the standard errors will not be correct, and in most cases they will be anti-conservative⁷⁹. In that case the estimation can be done using OLS with robust standard errors, clustering for countries⁸⁰. This is robust to any type of correlation within the observations of each country. The drawback is that the robust estimation suffers from being inefficient.

There are good reasons to expect the variance of the error term to differ between countries. Two countries considered can i.e. have different welfare systems. Even if the effect of economic fluctuations in principal is the same in these two countries (i.e. coefficients have the same sign) it might be that the strength of the effects is different. Consequently, the error terms will also differ, since the estimated coefficients are applied on all countries. This will result in heteroskedasticity between countries.

The crucial point is thus whether we have reasons to expect heteroskedasticity within each country. To test for this I have used White's (1980) test for heteroskedasticity, which is based on regressing the OLS residuals on a constant, the original regressors, their squares and cross-products⁸¹. Since it is the heteroskedasticity within each country, and not the heteroskedasticity

⁷⁸ <http://www.stata.com/support/faqs/stat/panel.html>

⁷⁹ http://www.stata.com/support/faqs/stat/xtgls_rob.html

⁸⁰ http://www.stata.com/support/faqs/stat/xtgls_rob.html

⁸¹ Kennedy (2003), p.154

between countries, that is of interest at this point I have performed the test in two different manners: First I have tested the models:

$$(13'') \text{mdnvotr}_{i,t} = \alpha + \mathbf{X}\beta + \gamma_g (\text{real growth})_{i,t} + \gamma_u (\text{unemployment})_{i,t} + u_{i,t}$$

$$(14'') \text{mdnvotr}_{i,t} = \alpha + \mathbf{X}\beta + \gamma_g (\Delta \text{real growth})_{i,t} + \gamma_u (\Delta \text{unemployment})_{i,t} + u_{i,t}$$

Then I have tested the very simple models

$$(15) \text{mdnvotr2}_t = \alpha + \gamma_g (\text{real growth})_t + \gamma_u (\text{unemployment})_t + u_t$$

$$(16) \text{mdnvotr2}_t = \alpha + \gamma_g (\Delta \text{real growth})_t + \gamma_u (\Delta \text{unemployment})_t + u_t$$

separate for each country. The test statistics are neither significant for any of the countries separately, nor for the general formulation, also including the sociological variables. The test results are summarized in the appendix. Consequently, I should be able to estimate the model efficiently using Feasible Generalized Least Squares, assuming heteroskedasticity between but not within countries⁸².

To test for the presence of autocorrelation I use a test developed by Wooldridge (2002)⁸³. Simulations by Drukker (2003) have shown the test to have good properties in reasonable sized samples⁸⁴. The test program for STATA is developed by Drukker. The test statistic is F-distributed, and a significant test-statistic shows the presence of autocorrelation. A way to reduce the problem of autocorrelation can be to include a dummy variable for each year in the sample.

⁸² The problem of heteroskedasticity can also be caused by the use of the wrong functional form. It may be problematic to estimate an indicator which has finite ends (-100 to 100) on several variables which have not (the sociological variables). A way to see if this is the case is to transform the political indicator using a logistic function. I have done this in two steps. (1) First I have transformed it such that it lies in the interval [0, 1]. (2) I have transformed it using the following formula:

$$\text{mdnvotr2}(b) = \ln \left(\frac{\text{mdnvotr2}}{1 - \text{mdnvotr2}} \right)$$

This new indicator will go towards infinite (both + and -) when the original indicator approaches the ends of the interval. I then do the same heteroskedasticity tests as above. The test results show approximately the same presence of heteroskedasticity as with the original indicator. Estimations, using this transformation, seem to give approximately the same results with the same level of significance as already obtained.

⁸³ Wooldridge (2002), p. 282-283. See also <http://www.stata.com/support/faqs/stat/panel.html>

⁸⁴ <http://www.stata.com/support/faqs/stat/panel.html>

These dummy-variables will capture year-specific effects across countries, not already captured by the economic and sociological variables. Examples of this can be wars, reforms in the EU etc. The drawback is that these dummy-variables also will capture economic fluctuations if these are international (like a high oil price). This may, wrongly, weaken the estimates for the effect of unemployment and growth on policy demand. Even so, I have found it best to include yearly dummies in the test for autocorrelation.

The test result is:

	Without year dummy <i>F-statistic (P-value)</i>	With year dummy <i>F-statistic (P-value)</i>
The level model	20,588 (0,0006)	34,011 (0,0001)
The acceleration model	29,101 (0,0001)	35,140 (0,0001)

Table 6.1: Results from a F-test, showing the presence of autocorrelation both with and without year dummies.

The results indicate a presence of autocorrelation in both models, also if a yearly dummy variable is included.

Hence, the preferred estimation procedure has to include country-specific constants, allow for heteroskedasticity and autocorrelation. I assume the errors to be heteroskedastic between but not within countries, and autocorrelated with country-specific correlation coefficients. I will consequently estimate the model using a Feasible Generalized Least Squares estimator. I will do this both with and without yearly dummies. When not using yearly dummies I will estimate with the help of Iterated FGLS, which in general provides higher efficiency⁸⁵.

The results of the estimation, without year dummies, are presented in the following table:

⁸⁵ When using Iterated FGLS STATA produces the Maximum Likelihood estimates (MLE) of the parameters (see: http://www.stata.com/support/faqs/stat/xtgls_rob.html). According to Kennedy (2003) the MLE estimate “is asymptotically unbiased, it is consistent, it is asymptotically efficient (...). Its only major theoretical drawback is that (...) the econometrician must assume a specific (e.g., normal) distribution for the error term. Most econometricians seem willing to do this.” (Kennedy (2003), p. 23-24).

Results 3: Efficient estimation of the level and the acceleration model using *mdnvotr2*

The political indicator *mdnvotr2* regressed on real growth, unemployment, the sociological variable matrix and country-specific constants using Iterated Feasible Generalized Least Squares estimation. Positive coefficients move policy demand towards right.

Mdnvotr2	The level model		The acceleration model	
	<i>Coefficient</i>	<i>z-value</i>	<i>Coefficient</i>	<i>z-value</i>
Unemployment	102,33***	4,65	Change in unemployment from last quarter	-53,89 0,67
Real growth	-121,70***	-5,43	Change in real growth from last quarter	-75,57*** -3,61
Openness	0,392	0,03	Openness	8,43 0,68
Religion	-0,0326	-0,17	Religion	0,177 0,85
Education	-1,216	-1,7	Education	0,07 0,08
Life expectancy	0,228	0,45	Life expectancy	1,02 2,07
Self employment	19,57	0,79	Self employment	-22,05 -0,85
Exchange rate	4,597***	7,64	Exchange rate	4,68*** 8,42
Immigration	1,20e+07	0,72	Immigration	2632261 0,18
Union density	0,066	0,54	Union density	0,081 0,58
Collective bargaining coverage	0,0389	0,35	Collective bargaining coverage	-0,086 -0,68
Inequality	27,77**	2,00	Inequality	48,52*** 2,61
Pop between 15-64	0,003***	2,53	Pop between 15-64	0,0026** 2,08
Constant	-39,84	-0,99	Constant	-117,21 -2,93
Number of obs:	134		Number of obs:	134
Wald chi2(25)	445,04		Wald chi2(25)	394,87
Log likelihood	-393,09		Log likelihood	-398,63

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

By improving the estimation methods, the effects of unemployment and real growth are both stronger and more significant. The effect of a change in growth is also significant. It seems like increased growth moves the median voter to the left. The effect of a change in the unemployment rate is negative, but not significant. The coefficients in front of the sociological variables are not to be given much weight under fixed effect estimation, assigning a constant for each country. These constants “steal” explanatory power from the slow-changing or constant sociological variables. The fixed effects model is only appropriate for explaining variation *within* each country and not the variation *between* countries. The use of the FGLS estimator rests critically on

the assumption of homoskedasticity within each country. I have therefore estimated the same model using OLS with robust standard errors clustering for country. For the level model the coefficients point clearly in the same direction. The effect of growth is highly significant (-107,35, with a t-value of 2,93). The effect of unemployment is almost halved compared to the coefficient from the IFGLS estimation and not significant (58,24, with a t-value of 1,06). The size, direction and significance of the coefficients for the acceleration model are quite similar to the OLS estimation in results 1. The complete results are found in the appendix.

For the level model, the IFGLS estimates above (results 3) seem fairly robust. By including year specific dummies, the coefficients for growth and unemployment are reduced to -99,9 and 89,6, respectively. Both are significant at the 1% level. Inclusion of yearly dummy variables in the acceleration model, however, makes the coefficients for the change in growth and unemployment change rather dramatically, to -23,8 and 226,7, respectively. None of them are significant. When dummy variables for both countries and years are used, 65 coefficients are estimated with the help of 134 observations. This is obviously a problem for the efficiency of the estimate.

Due to missing data, the estimation above is done using only 134 elections in 14 countries. To ensure that the results are robust when all countries are included I estimated the model without sociological variables. The model then becomes:

$$(17) \quad y_{it} = \alpha + \delta_i + \gamma_1 G_{it} + \gamma_2 U_{it} + e_{it}$$

The estimation is done by OLS with robust standard errors and clustering on country⁸⁶.

⁸⁶ White's test indicates that heteroskedasticity is present, and thus I choose to use the more "conservative" robust estimation technique. The Wooldridge test shows that autocorrelation also is present. This estimate is thus correct, but not efficient, leading to lower t-values. For a presentation of Cluster-Sample methods in Econometrics, see Wooldridge (2003). The estimator STATA uses is the linearization/Huber/White/sandwich (robust) estimates of variance, see (http://www.stata.com/support/faqs/stat/xtgls_rob.html). For a general presentation of robust estimators, see Kennedy (2003), p. 372.

Results 4: Robust estimation of the level and acceleration models without the sociological variables

The political indicator regressed on real growth, unemployment and country-specific constants using Robust OLS estimation, clustering on countries. Positive coefficients move policy demand towards right.

Mdnvotr2	The level model			The acceleration model	
	Coefficient	t-value		Coefficient	t-value
Unemployment	82,24	1,67	Change in unemployment from last quarter	215,34	1,64
Real growth	-113,86**	-2,55	Change in real growth from last quarter	-28,38	-1,13
Country dummies:			Country dummies:		
Australia	22,12***	7,82	Australia	17,77***	65,45
Austria	(dropped)		Austria	(dropped)	
Belgium	12,23***	4,15	Belgium	7,43***	26,74
Canada	12,72***	5,93	Canada	8,88***	19,22
Denmark	12,39***	3,60	Denmark	7,27***	23,96
Finland	2,32	0,71	Finland	-3,01***	-15,16
France	7,13**	2,82	France	3,77***	9,92
Germany	19,88***	4,84	Germany	13,04***	39,06
Greece	(dropped)		Greece	(dropped)	
Iceland	17,46***	3,74	Iceland	10,03***	24,43
Ireland	18,82***	26,94	Ireland	17,20***	115,32
Italy	13,52***	5,83	Italy	9,31***	41,30
Japan	(dropped)		Japan	(dropped)	
Luxembourg	6,01	1,22	Luxembourg	-2,67***	-6,44
Netherlands	5,90*	1,98	Netherlands	0,88***	4,20
New Zealand	12,86***	3,14	New Zealand	5,95***	11,61
Norway	-5,05	-1,18	Norway	-12,58***	-29,07
Portugal	14,63***	7,41	Portugal	11,08***	37,77
Spain	(dropped)		Spain	(dropped)	
Sweden	-1,23	-0,29	Sweden	-8,32***	-20,14
Switzerland	22,18***	4,31	Switzerland	14,39***	45,17
UK	8,44***	2,80	UK	4,03***	10,24
USA	19,67***	7,65	USA	15,70***	37,41
Constant	-20,59***	-3,64	Constant	-23,30***	-35,01
Number of obs:	188		Number of obs:	188	
Root	9,11		Root	9,55	
MSE			MSE		
R-squared	0,51		R-squared	0,46	

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

(dropped): Due to missing data.

The estimations confirm the findings from Results 3, at least for the level model, but are, as expected, less significant. The robust OLS estimates seem to question the effect of unemployment while the effect of growth is still clearly significant. The coefficients for a change in unemployment in the acceleration model have a positive sign, opposite of the results obtained using the FGLS model.

To examine the robustness and the generality of the results shown above I have estimated the same models using the other six political indicators presented above. I have followed the same test procedure as above. I have also made the same assumptions concerning the nature of the heteroskedasticity. The estimations are done using Iterated FGLS with country-specific constants and allowing for autocorrelation and heteroskedasticity when the test shows that this is needed⁸⁷. Since the coefficients for the sociological variables suffer from using this fixed effects model I report only for unemployment and real growth. Complete results are available on request.

⁸⁷ The test shows the presence of heteroskedasticity between countries in all estimations, while autocorrelation is present in all estimations except when using the indicator *mdnvotr6*. The estimated coefficients for *mdnvotr6* are thus not corrected for autocorrelation. The estimations using *mdnvotr3* and *mdnvotr6* are done with FGLS, not Iterated FGLS, because the iterations did not reach convergence within a reasonable number of iterations..

Results 5: Estimating the level and acceleration model with all the 7 indicators.

All seven political indicators regressed on real growth, unemployment, the sociological variable matrix and country-specific constants using Iterated Feasible Generalized Least Squares. Positive coefficients move policy demand towards right.

		Dynamic		Semi-dynamic		Static		
		Coefficient		Coefficient		Coefficient		
		(z-value)		(z-value)		(z-value)		
		Mdnvotr1	Mdnvotr4	Mdnvotr2	Mdnvotr5	Pol	Mdnvotr3	Mdnvotr6
(13) The level model	Unemployment	168,58*** (4,57)	101,45*** (3,05)	102,33*** (4,65)	82,69*** (3,87)	-67,65*** (-2,92)	15,13 (1,20)	6,02 (0,49)
	Real growth	-89,13** (-2,51)	-92,48*** (-2,93)	-121,69*** (-5,43)	-103,65*** (4,52)	14,66 (0,43)	-32,96* (-1,77)	-22,64 (-1,27)
	#. obs.:	134	134	134	134	158	134	134
	Wald chi2(25):	186,16	471,45	445,04	461,56	6487,79	955,80	1388,03
	Log likelihood	-448,84	-437,61	-393,09	-380,30	-491,62	-325,27	-310,71
	(14) The acceleration model	Change in unemployment	-58,02 (-0,26)	122,39 (0,62)	-53,89 (-0,43)	27,80 (0,24)	-209,83* (-1,90)	-81,84 (-1,33)
	Change in real growth	-54,29 (-1,58)	-83,57*** (-2,88)	-75,57*** (-3,61)	-63,83*** (-3,11)	-61,29** (-1,96)	-40,78** (-2,46)	-44,66*** (-2,79)
	#. obs.:	134	134	134	134	158	134	134
	Wald chi2(25):	168,25	404,12	394,87	383,51	7137,60	808,04	1505,83
	Log likelihood	-456,41	-441,22	-398,63	-384,38	-492,14	-319,50	-304,47

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

The results show that the estimates made with the semi-dynamic indicator *mdnvotr2*, is also robust using the other indicators. A high level of unemployment makes policy demand move to the right, while high economic growth makes policy demand move to the left. An exception is the coefficient for unemployment when using the indicator *pol* as the dependent variable.

A pre-election increase in the growth rate has the same effect, while the effect of a pre-election increase in the unemployment rate is more unclear. There are only two significant estimates of the effect of a pre-election change in the unemployment rate, and both indicate that this moves policy demand to the left.

During the process I have experimented with several models and estimators⁸⁸. The coefficients in the level model, using the indicator *mdnvotr2*, vary between 30 and 149 for unemployment. The coefficients for real growth vary between -80 and -120. The level for which they are significant

⁸⁸ Fixed effects, random effects, panel corrected standard errors, Prais-Winston estimation etc. The estimations are done with and without country-specific constants, the sociologic variables, year dummies etc.

varies, but is in most cases at least on a 5% level. The coefficients are always in the same direction. I am thus convinced that the results are fairly robust, at least for the level model, even though the size of the coefficients, especially for the effect of unemployment, seems rather uncertain.

Notice that the dynamic indicators give significant coefficients on the *levels* of both growth and unemployment. The static indicators give the strongest result on the *acceleration* in both growth and unemployment. The semi-dynamic indicators seem to give, overall, the strongest results.

The negative coefficient for unemployment, when using the indicator *pol* in Results 5, is an interesting exception. The effect of high unemployment seems to be that policy demand moves to the right when using dynamic and semi-dynamic indicators. The effect when using the static indicators, however, is the opposite. This result is also confirmed when using robust estimation. In the table below the coefficients for unemployment from results 5 and the corresponding robust estimation is shown:

Table 6.2.: Investigating the effect of unemployment in the level model

The table displays the coefficient for the effect of unemployment on policy demand. All seven political indicators are regressed on unemployment, real growth, the sociological variables and country-specific constants. The estimations are done both with IFGLS and OLS with robust standard errors, clustering for country. A positive coefficient moves policy demand to the right. Complete results are found in Results 5 and in the appendix.

		Dynamic		Semi-dynamic		Static		
		Coefficient (z-value / t-value)		Coefficient (z-value)		Coefficient (z-value)		
		Mdnvotr1	Mdnvotr4	Mdnvotr2	Mdnvotr5	Pol	Mdnvotr3	Mdnvotr6
The effect of unemployment	Iterated FGLS	168,58***	101,45***	102,33***	82,69***	-67,65***	15,13	6,02
		(4,57)	(3,05)	(4,65)	(3,87)	(-2,92)	(1,20)	(0,49)
	OLS with robust st.err.	91,54	101,62	58,24	43,35	-53,35	20,14	7,54
		(1,34)	(1,50)	(1,06)	(0,78)	(-1,21)	(0,61)	(0,31)

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

It seems like the coefficients are larger the faster the political parties are allowed to move along the left-right axis. When the indicator is static, the coefficients are very small. When estimating the effect of unemployment on the indicator *pol*, the effect is negative. Based only on this, an attempt to explain why it is so will only be speculations. Nevertheless, a possible reason may be that it is the political parties, and not the voters, that move right when unemployment is high. If so, the dynamic and semi-dynamic indicators will capture this and indicate that the median voter

has moved to the right as well. The static indicators, however, will not capture this movement, because these indicators only show the voters' movement *between* the political parties. If the simple indicator *pol* is chosen to be trusted, the effect of high unemployment on the voters, not the political parties, is hence a move to the left.

Consequently, the interaction between voters and political parties, and the effect of unemployment on voters, parties, and their interaction, are questions in need of further research.

Predictions from the general model

Using the estimated coefficients from results 3 it is possible to test the model's ability as a tool for prediction. This can be done by comparing the model's predictions with the actual movement in the political indicator. It will probably be possible to do better predictions by calibrating the model to fit a specific country. Even so, this general test of prediction gives an intuition on how good or bad the model actually fits reality. First I use the estimated coefficients for the level model with the indicator *mdnvotr2* to model the development in policy demand over time. The correlation between the fitted model and the original indicator is as high as 0,84⁸⁹. By taking the first difference of both the indicator and the fitted model, I can check whether changes in policy demand from election to election are well predicted by the model. The results are shown in table 6.3:

⁸⁹ This is to a large extent caused by the sociological variables and the country-specific dummy variables.

Table 6.3.: Predictions: Testing the level model's predicting ability

The table shows percentage share of a country's elections where the model actually predicts the direction of the move in policy demand correctly. Since policy demand has to move either to the right or to the left, 50% is what you could expect without a model.

Country	Number of elections	Percentage correct direction of the models prediction
Australia	11	45
Austria	n.e.	
Belgium	11	64
Canada	10	80
Denmark	n.e.	
Finland	9	44
France	7	71
Germany	7	29
Greece	n.e.	
Iceland	n.e.	
Ireland	9	56
Italy	8	75
Japan	n.e.	
Luxembourg	n.e.	
Netherlands	7	14
New Zealand	n.e.	
Norway	8	100
Portugal	n.e.	
Spain	n.e.	
Sweden	11	64
Switzerland	7	71
United Kingdom	7	43
United States of America	8	63
Overall	120	59

Table 6.3: Percentage correct direction on the estimated model's prediction

The model's predicting ability varies considerably between countries. Most of the "within"-variation in the prediction originates from changes in real growth and unemployment. Both successes and failures of the prediction are probably caused by heterogeneity in the impact of economic fluctuations between countries. Another reason may be that the weight put on growth and unemployment, respectively, may differ between countries.

Country-specific and calibrated models

To see how countries differ, it is informative to do very simple regressions for each country separately. The following table shows the estimated coefficients, t-values and R-squared for the following model, estimated for each country:

$$(15) \text{mdnvotr}2_t = \alpha + \gamma_g (\text{real growth})_t + \gamma_u (\text{unemployment})_t + u_t$$

Results 6: Country wise estimation of the level model

The political indicator regressed on real growth and unemployment using Ordinary Least Squares estimation. The estimations are done separately on each country. Positive coefficients move policy demand to the right. Some of the countries contain critically few observations.

Country	Unemployment	Real growth	Constant	R-squared
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Australia	267,48*** (3,29)	-0,46 (0,46)	-9,01 (-1,77)	0,55
Austria	n.e.	n.e.	n.e.	n.e.
Belgium	153,14*** (3,94)	-116,46 (-0,46)	-12,16*** (-3,38)	0,73
Canada	118,63*** (3,84)	-291,33*** (-3,42)	-8,00** (-2,62)	0,90
Denmark	-85,32 (-0,99)	-187,32 (-0,72)	-0,67 (-0,15)	0,12
Finland	95,03* (2,12)	-70,42 (-0,67)	-19,12*** (-7,19)	0,39
France	142,12** (3,15)	-153,47 (-2,82)	-17,39 (-5,28)	0,76
Germany	35,99 (0,45)	59,92 (0,36)	-0,74 (-0,20)	0,03
Greece	n.e.	n.e.	n.e.	n.e.
Ireland	-223,38*** (-4,46)	-19,03 (-0,06)	27,70*** (4,67)	0,74
Iceland	113,88 (0,90)	131,64 (0,99)	-5,43 (-1,74)	0,19
Italy	198,68** (3,40)	-139,73 (-0,90)	-14,50** (-2,89)	0,75
Japan	n.e.	n.e.	n.e.	n.e.
Luxembourg	382,78** (7,46)	323,82** (4,72)	-23,52*** (-24,34)	0,98 ⁹⁰
Netherlands	28,53 (0,44)	328,06 (1,13)	-15,79 (-4,08)	0,29

⁹⁰ The estimate for Luxembourg is made using only 5 observations. Estimates made when the degrees of freedom are very low are not very credible.

New Zealand	175,09** (3,32)	1,16 (0,01)	-12,10*** (-4,50)	0,59
Norway	239,69* (2,09)	-89,94 (-0,61)	-30,05*** (-6,64)	0,49
Portugal	68,03 (0,14)	-2268,27* (2,31)	17,04 (0,45)	0,51
Spain	-27,16 (-0,56)	135,30 (0,51)	-9,33 (-1,69)	0,12
Sweden	431,21** (2,77)	-157,56 (-0,67)	-30,79*** (-5,75)	0,49
Switzerland	-355,06** (-3,93)	-113,27 (-0,91)	5,96*** (4,32)	0,76
United Kingdom	159,42*** (5,12)	-26,46 (-0,23)	-16,60*** (-7,66)	0,84
United States of America	642,26 (1,93)	-76,10 (-0,15)	-35,52 (-1,73)	0,39

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$

n.e.: not estimated, due to lacking data.

Again we see that economic fluctuations have explanatory power on policy demand. In most countries they explain a large share of the variation in the political indicator. However, some countries are different. Policy demand in Denmark, Germany, Iceland, Netherlands, and Spain seem to be rather unaffected by economic fluctuations. Of the remaining 14 countries, almost all of them seem to be influenced as expected from theory, and confirmed by the general estimation results above. The exceptions are Ireland, New Zealand, and Switzerland. Ireland and Switzerland are the only two countries with significantly (and credible) different signs on the coefficients. The influence of unemployment on policy demand in these countries seems to be the opposite of the general results from above. Both have negative coefficients, signifying that policy demand moves left when the unemployment rate is high.

An illustration of the model's fit can be made in a diagram. The coefficients used are from the country-specific OLS estimation above, on the data for unemployment, and real economic growth. In the graph, I draw the actual policy demand fluctuations, together with the prediction of this very simple model. As the cautious reader will recognize, the illustrated countries are not chosen arbitrarily.

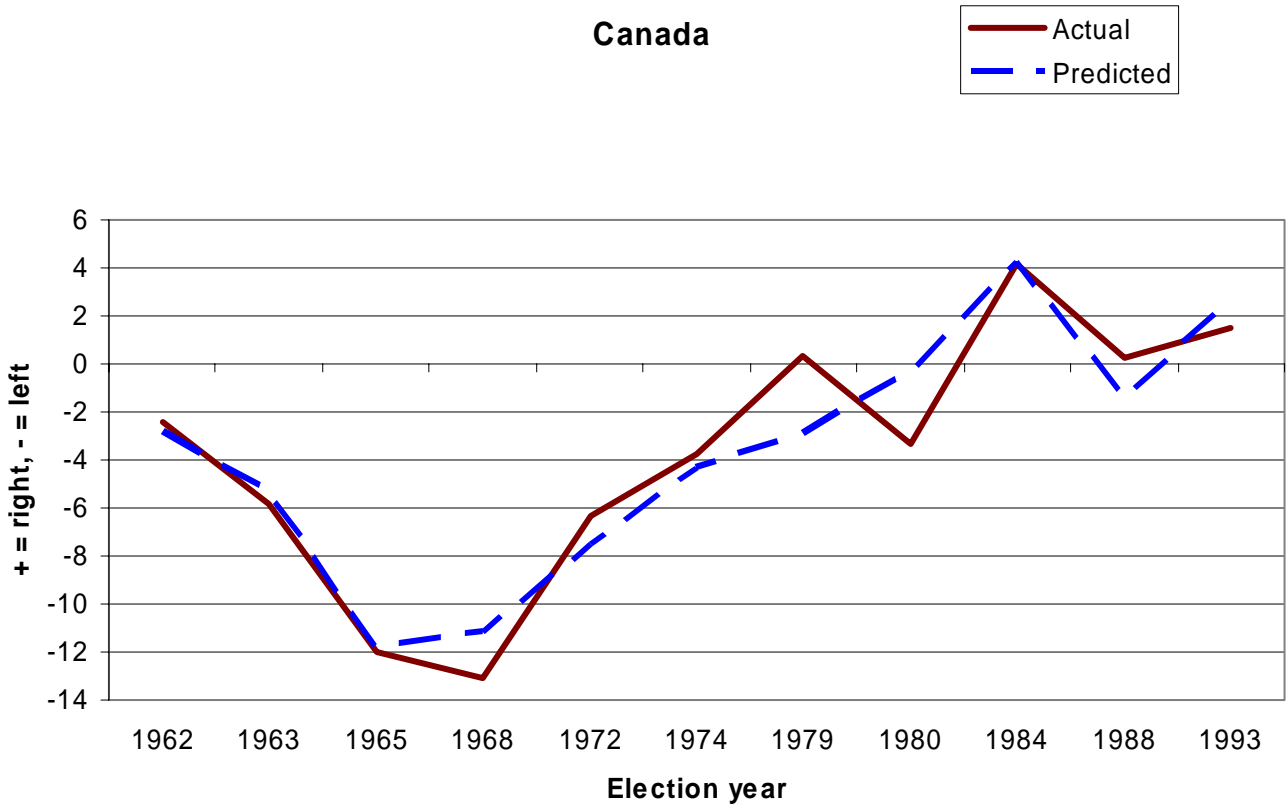


Fig. 6.1: A very simple model, using real growth and unemployment to explain the variation in mdnvotr2 over time in Canada.

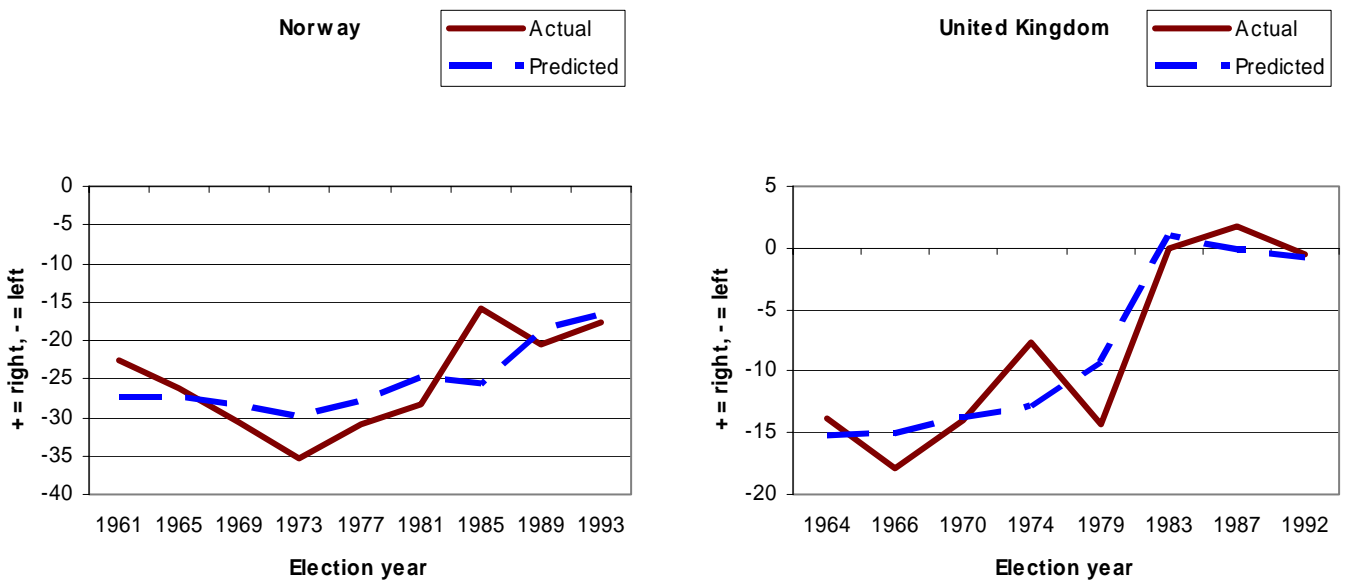


Fig. 6.2: A very simple model, using real growth and unemployment to explain the variation in mdnvotr2 over time in Norway and the UK.

As made obvious by the graphs, much of the fluctuations in policy demand can be explained by economic fluctuations. However, there is also much variation that cannot be explained by such a simple model. To illustrate the difference I have made a similar comparison, for France and Norway, using the full model estimated for the whole sample. This model is estimated both with sociological variables and the country-specific constants. The graph shows that this model's fit is rather good.

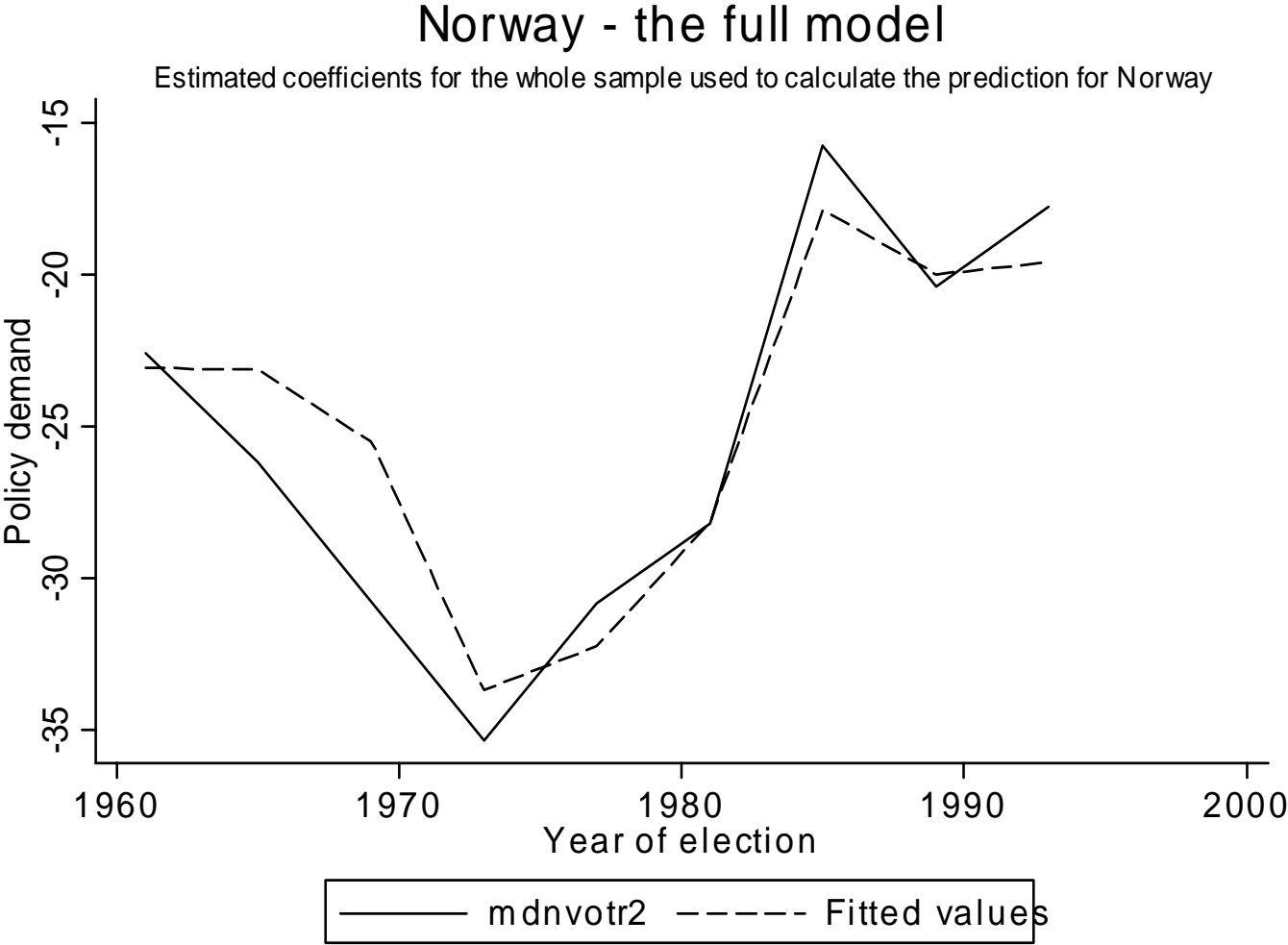


Fig. 6.3: Prediction on Norway, made by using the coefficients for the level model presented in Results 3.

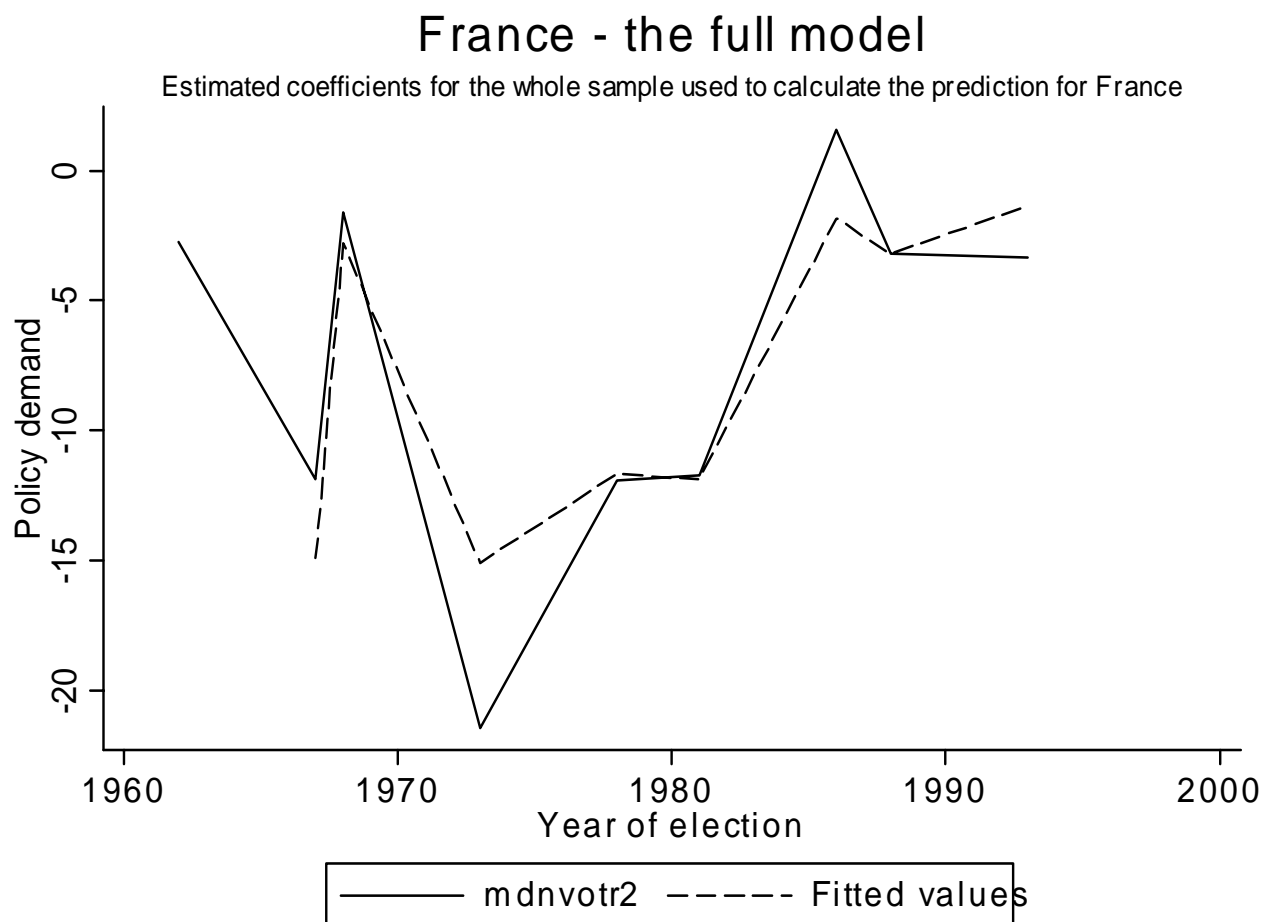


Fig. 6.4: Prediction on France, made by using the coefficients for the level model presented in Results 3.

I have also done the estimations in this chapter using nominal growth rates instead of real growth rates. The results seem to be more or less identical but with higher variance on the estimated coefficients, i.e. less certain estimates. The reason for this may be that voters respond differently to inflation than to growth and the estimates for nominal growth will thus be a mix of these two responses.

7. Conclusion

Economic fluctuations have an impact on voting behavior. The estimations indicate that the median voter votes more radical when the economy's growth rate is high and more conservative when the unemployment rate is high. I have also found (weak) evidence indicating that an increase in unemployment before an election moves policy demand to the left.

Above I have argued that the key to understanding these fluctuations is social insurance. The middle class, who constitute the main segment of the voters in the OECD countries, rely on social insurance provided by the welfare state. Their need for insurance depends on their perception of their future income and job security. Consequently, a large part of these short term economic fluctuations can be explained by simple microeconomics.

The results of my thesis are consistent with the results from Stevenson (2001) and Durr (1993). They draw the same conclusions as I do with respect to how economic growth and unemployment affect policy demand. A high level of growth moves policy demand to the left, while a high unemployment rate moves policy demand to the right. The novelty is that I also offer an explanation for this phenomenon. I also find support for the more complex effects of unemployment; that the actual rate and its change may affect voting in opposite directions.

The understanding of how changes in policy affect the economy is crucial to Economics. In this thesis I have tried to show that policy changes cannot be treated exogenously. The two are interdependent and should be treated as such in broad analyses of the effect of economic policies.

My findings raise new questions concerning the interaction between voters and political parties. How are the political parties affected by economic fluctuations? To what extent is the movement of the median voter caused by a movement of the political parties? Why do some countries seem to differ? What is the impact on voting behavior of the various welfare state institutions in different countries? The interaction between politics and the economy may shed light on questions interesting for both political scientists and economists.

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Appendix

(A) Proof for the calculus in chapter 3

Proof for (5):

$$(1') V_i = p_i u((1-t)W_i^e) + (1-p_i)u\left(\tau(t)\frac{\gamma}{1-\gamma}\bar{W}^e\right)$$

Maximize s.t. t to find the F.O.C which indirectly defines $\frac{dt}{dW_i^e}$:

$$(7) \text{ F.O.C.: } \frac{\delta V_i}{\delta t} = p_i u'(w_i^e)(1-t)(-W_i^e) + u'(w_i^e)(-1)$$

Define:

$$(8) \frac{\delta V_i}{\delta t} \equiv g(t, W_i^e) = 0$$

By differentiating $g(\cdot)$ s.t. both variables I get:

$$(9) \quad g'_t dt + g'_{W_i^e} dW_i^e = 0 \Rightarrow \frac{dt}{dW_i^e} = -\frac{g'_{W_i^e}}{g'_t}$$

$$g''_t \equiv \frac{\delta^2 V_i}{\delta t^2} = p_i u''(w_i^e)(-w_i^e)^2 + (1-p_i) \left[u''(B) \left(\frac{\gamma}{1-\gamma} \bar{W}^e \tau'(t) \right)^2 + u'(B) \frac{\gamma}{1-\gamma} \bar{W}^e \tau''(t) \right] < 0$$

From the assumptions of the second derivatives of all the functions we see that this expression is strictly negative.

$$g'_{W_i^e} = \frac{\delta V_i}{\delta t \delta W_i^e} = p_i \left[-u''(w_i^e)(1-t)W_i^e - u'(w_i^e) \right] = p_i u'(w_i^e) \left[-\frac{u''(w_i^e)}{u'(w_i^e)} w_i^e - 1 \right] = p_i u'(w_i^e) [\mu - 1]$$

Where $\mu = -\frac{u''(w_i^e)w_i^e}{u'(w_i^e)}$ and equals the coefficient of relative risk aversion, empirically

estimated to be inside the interval: $\mu \in \{3, 4\}$ ⁹¹.

$$(5) \frac{dt}{dW_i^e} = -\frac{g'_{w_i^e}}{g'_t} = -\frac{p_i u'(w_i^e) [\mu - 1]}{\frac{\delta^2 V_i}{\delta t^2}} > 0$$

Proof for (6)

From (8) I define:

$$(10) \frac{\delta V_i}{\delta t} \equiv g(t, p_i) = 0$$

By differentiating $g(\cdot)$ s.t. both variables I get:

$$(11) \quad g'_t dt + g'_p dp = 0 \Rightarrow \frac{dt}{dp_i} = -\frac{g'_{p_i}}{g'_t}$$

$$g'_p = \frac{\delta V_i}{\delta t \delta p_i} = -u'(w_i^e) W_i^e - u'(B) \frac{\gamma}{1-\gamma} \bar{W}^e \tau(t) < 0$$

$$(6) \frac{dt}{dp_i} = -\frac{g'_{p_i}}{g'_t} = -\frac{\frac{\delta V_i}{\delta t \delta p_i}}{\frac{\delta^2 V_i}{\delta t^2}} < 0$$

⁹¹ Moene and Wallerstein (2003)

(B) Data: sources and treatment

Political data

The political dataset from Duane Swank, used to construct the indicator *pol*, is available on Swank's homepage⁹². In the data set there is information on year and month of each election. This is used to sort the elections into the correct quarters. The data set contains a set of variables for the different party groups' (left, center, Christian democrat and right) share of the votes received in the last election. The election result in the year of the election, call it year t, is thus a weighted average of the previous and present election, where the actual month the election took place constitutes the weights. In the year after the election (year t+1) is thus the data for electoral votes in year t correct. However, if there is new election in year t+1 this data will be a new weighed average. In this few cases this will create a minor error in the data. This problem concerns only a small number of elections.

The indicator *pol* is constructed in the following manner:

$$pol_t = leftv_{t+1} * (-1) + centerv_{t+1} * (0) + mcdemv_{t+1} * (0) + rightv_{t+1} * (1)$$

The dataset from McDonald, containing the indicators *mdnvotr1-6*, is found on his website⁹³. The data set contains the six indicators and information of month and year of the election. This is used to sort it into the right quarter.

The formula to calculate the median voter position is found in McDonald's codebook and is taken from Kim and Fording. The formula is⁹⁴:

$$M = L + \{(50 - C)/F\} * W.$$

where

M = Median voter position

L = The lower end (left-right score) of the interval containing the median

C = The cumulative vote share up to but not including the interval containing the median

F = The vote share in the interval containing the median

⁹² <http://www.marquette.edu/polisci/Swank.htm>

⁹³ <http://www.binghamton.edu/polisci/research/mcdonalddata.htm>

⁹⁴ Quoted from McDonald's codebook.

W = The width of the interval containing the median—i.e., the range of midpoints between the party of the median voter and adjacent parties to its left and right

Economic data

The quarterly economic data for growth and unemployment is from OECD and can be found on Source OECD – Economic Outlook⁹⁵. Real economic growth is simply calculated as:

$$gr_t = \frac{GDPr_t}{GDPr_{t-1}} - 1$$

Unemployment is given by OECD in percent. To make it more easily comparable with real growth I have scaled it by dividing each observation with 100.

⁹⁵ http://puck.sourceoecd.org/vl=2920334/cl=104/nw=1/rpsv/statistic/s3_about.htm?jnlissn=16081153

Sociologic data

The variables used, their sources and actual observations are:

Variable	Source	Observations
Religion	World Values Surveys, weekly religious attendance for the 1990's	One observation for each country
Immigration	OECD Factbook 2005 – Immigrant population in OECD countries	Observations for 1990 and 2002
Openness	OECD Economic Outlook, constructed as (Imports + Exports) / 2*GDP	Yearly for the whole period, with few gaps
Pop1564	OECD Economic Outlook, simply scaled down the size of the population in this age group	Yearly observations for the whole period with few gaps
Union bargaining coverage	OECD Employment Outlook 2004 – collective bargaining coverage	Observations for 1980, 1990 and 2000
Union density	OECD Employment Outlook 2004 – trade union density	Observations for 1970, 1980, 1990 and 2000
Pre-tax gini (inequality)	Luxembourg Income Study	Several observations, with gaps from mid 80's and upwards
Exchange rate	OECD Economic Outlook	Available for whole period, with few gaps
Self employment	OECD Factbook – self employment rates	Observations for 1990 and 2003
Education	OECD Factbook – tertiary attainment for age group 25-64	Observations for 1991 and 2002
Life expectancy	OECD Factbook – life expectancy at birth	Observations for 1960, 1970, 1980, 1990 and 2000

(C) Test results

White's test for heteroskedasticity

Country	The level model	The acceleration model
	$mdnvotr2 = \alpha + \gamma_g g_t + \gamma_u u_t + u_t$	$mdnvotr2 = \alpha + \gamma_g \Delta g_t + \gamma_u \Delta u_t + u_t$
	test statistic	test statistic
	(p-value for wrong rejecting H0: no heteroskedasticity)	(p-value for wrong rejecting H0: no heteroskedasticity)
Australia	4,04 (0,54)	7,61 (0,18)
Austria	n.e.	n.e.
Belgium	9,07 (0,11)	3,13 (0,68)
Canada	5,10 (0,40)	4,98 (0,42)
Denmark	8,03 (0,15)	1,37 (0,93)
Finland	3,96 (0,55)	4,34 (0,50)
France	4,08 (0,54)	4,31 (0,51)
Germany	9,80 (0,08)	8,36 (0,14)
Greece	n.e.	n.e.
Iceland	8,52 (0,13)	4,33 (0,50)
Ireland	6,23 (0,28)	8,05 (0,41)
Italy	7,56 (0,18)	3,12 (0,68)
Japan	n.e.	n.e.
Luxembourg	5,00 (0,29)	5,00 (0,29)
Netherlands	7,89 (0,16)	8,50 (0,39)
New Zealand	3,75 (0,59)	4,86 (0,43)
Norway	7,29 (0,20)	6,28 (0,28)
Portugal	7,84 (0,17)	3,70 (0,59)
Spain	6,00 (0,31)	6,00 (0,31)
Sweden	2,23 (0,82)	3,00 (0,70)
Switzerland	4,84 (0,44)	7,01 (0,22)
United Kingdom	7,76 (0,17)	7,55 (0,18)

United States of America	3,21 (0,67)	1,55 (0,91)
	n.e.: not estimated due to missing data	n.e.: not estimated due to missing data
General model, including sociological variables, estimated for the whole sample	110,0174 (0,3)	118,8233 (0,1364)
	* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$	

(D) Estimation results

Results 7: Robust estimation of the level and acceleration models using *mdnvotr2*

The political indicator *mdnvotr2* regressed on real growth, unemployment, the sociological variable matrix and country-specific constants using OLS with robust standard errors, clustering on countries. Positive coefficients move policy demand towards right.

Mdnvotr2	The level model		The acceleration model	
	<i>Coefficient</i>	<i>t-value</i>	<i>Coefficient</i>	<i>t-value</i>
Unemployment	58,24	1,06	Change in unemployment from last quarter	215,47 0,95
Real growth	-107,35**	-2,93	Change in real growth from last quarter	-45,18 -1,00
Openness	-33,10	-1,04	Openness	-26,59 -0,74
Religion	0,38	0,84	Religion	0,42 0,95
Education	-0,65	-0,33	Education	-0,30 -0,16
Life expectancy	1,52	1,29	Life expectancy	2,10* 1,89
Self employment	107,90*	1,85	Self employment	96,94 1,53
Exchange rate	4,09***	6,94	Exchange rate	4,05 4,56
Immigration	-2,11e+07	-0,70	Immigration	-2,10e+07 -0,68
Union density	0,38	1,37	Union density	0,39 1,29
Collective bargaining coverage	0,27	1,35	Collective bargaining coverage	0,22 1,00
Inequality	40,18	1,16	Inequality	49,11 1,49
Pop between 15-64	0,38***	4,23	Pop between 15-64	0,03*** 3,26
Constant	-178,86	-1,71	Constant	-227,70** -2,93
Number of obs:	134		Number of obs:	134
R-squared	0,74		R-squared	0,73
Root MSE	7,14		Root MSE	7,28

* = $p \leq 0,1$ ** = $p \leq 0,05$ *** = $p \leq 0,01$