

Electoral Competition and the Dynamics of Public Debt

Context-Conditional Political Budget Cycles

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ABSTRACT

Why and under what conditions do governments borrow before elections? This thesis aims to shed light on this question by exploring governments' incentives that give rise to political budget cycles, i.e. fluctuations in the budget balance during election times, under different political, institutional, and economic contexts. The argument will be developed in three stages. First, the thesis will explain why politicians may choose to use debt strategically to win elections and discuss and evaluate different models that can explain political budget cycles. One model, a moral hazard type competence model is, as will be shown, particularly suited for this study. It will be extended in stages two and three.

The second stage will look at the benefits and costs from public debt, with a particular emphasis on the likelihood of re-election (government popularity), party system polarisation, and sovereign risk. Sovereign risk increases the cost of borrowing and thus dampens the magnitude of political budget cycles; the effect of government popularity on strategic debt is conditional on the degree of polarisation.

The third stage will take the motives to borrow as given and examine the effectiveness of debt as a strategic instrument. The less voters attribute responsibility for fiscal policy to governments, the less effective debt is as a strategic instrument. Economic volatility, regulatory density, and economic openness, this thesis argues, reduce this effectiveness and in turn the political budget cycle. Similarly, coalition government reduces responsibility associated with individual coalition partners, and thus the strategic value of public debt - yet this effect is moderated by the distribution of cabinet portfolios.

The argument in this thesis is based both on formal models and on empirical, time series-cross sectional, analyses. It is arguably the most comprehensive treatment of political budget cycles and adds to an increasing literature on the contextual determinants of fiscal policy.

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Contents

1	Introduction	8
1.1	Introduction	9
1.2	Exploring the Costs of Public Debt	12
1.3	Explaining the Dynamics of Public Debt	16
1.4	The Argument	25
1.5	Methods of Inference	28
1.6	The Contribution	29
1.7	Conclusion	31
I	Model Selection	32
2	Models of Strategic Debt	33
2.1	Introduction	34
2.2	Incumbent's Competence	35
2.2.1	Adverse Selection	37
2.2.2	Moral Hazard	40
2.3	Policy Reputation	42
2.4	Future Constraints	44
2.5	Conclusion	46
3	Voter Reactions to Electioneering	47
3.1	Introduction	48
3.2	Related Literature	50
3.3	Theory	53
3.4	Data	54
3.5	Estimation	57
3.6	Results	58
3.7	Conclusion	67
3.8	Appendix	69
II	Costs and Benefits	70
4	Government Popularity and Polarisation	71
4.1	Introduction	72
4.2	Related Literature	73
4.3	Theory	76
4.4	Data	83
4.5	Estimation	88
4.6	Results	90
4.7	Conclusion	96
4.8	Appendix	98
4.8.1	Theoretical	98
4.8.2	Empirical	99

5	Sovereign Risk	100
5.1	Introduction	101
5.2	Related Literature	103
5.3	Theory	106
5.4	Data	110
5.5	Estimation	114
5.6	Results	116
5.7	Conclusion	124
5.8	Appendix	126
5.8.1	Theoretical	126
5.8.2	Empirical	127
III	Signal Extraction	129
6	Economic Disturbances	130
6.1	Introduction	131
6.2	Related Literature	133
6.3	Theory	137
6.4	Data	141
6.5	Estimation	143
6.6	Results	145
6.7	Conclusion	151
6.8	Appendix	152
6.8.1	Theoretical	152
6.8.2	Empirical	152
7	Coalition Government I	154
7.1	Introduction	155
7.2	Related Literature	158
7.2.1	From Voters to Parties	158
7.2.2	From Parties to Government	160
7.2.3	From Government to Policy	162
7.2.4	From Policy to Voters	165
7.2.5	Squaring the Circle	165
7.3	Theory	167
7.4	Discussion	175
7.5	Empirical Implications	176
7.6	Conclusion	178
7.7	Appendix	180
8	Coalition Government II	184
8.1	Introduction	185
8.2	Data	186
8.2.1	Main Analysis	186
8.2.2	Subsidiary Analysis	190
8.3	Estimation	193
8.4	Results	197
8.4.1	Main Analysis	197
8.4.2	Subsidiary Analysis	206
8.4.3	Robustness Checks	206
8.5	Conclusion	209
8.6	Appendix	210

IV Summary & Conclusion	212
9 Empirical Reprise	213
9.1 Introduction	214
9.2 Review: Empirical Specification	214
9.3 Empirical Analysis	216
9.4 Conclusion	224
10 Conclusion	225
10.1 Introduction	226
10.2 Models and Assumptions	227
10.3 Context and Strategic Debt	228
10.4 Scope of the Thesis	231
10.5 Contribution to the Literature	231
10.6 Wider Implications	233
10.7 What Remains to be Done?	234
Bibliography	236

List of Tables

2.1	Models of strategic debt	36
3.1	MLM regression results: Government support and expenditure growth	60
3.2	MLM regression results: PM support and expenditure growth	63
3.3	Expected values and differences	65
A.3.1	Descriptive statistics	69
4.1	Regression results: full sample	91
4.2	Regression results: low polarisation	92
4.3	Regression results: high polarisation	93
4.1	Time line for the budget procedure	99
4.2	Descriptive statistics	99
5.1	Sovereign risk ratings and political budget cycles	117
5.2	T-Bond yields and political budget cycles	119
5.3	CDS Bid yields and political budget cycles	120
5.4	Marginal effects	121
5.1	Numerical coding of Fitch Ratings	127
5.2	Descriptive statistics for full sample (sovereign risk ratings)	127
5.3	Descriptive statistics for full sample (T-Bond yields)	128
5.4	Descriptive statistics for full sample (CDS bid yields)	128
6.1	Economic volatility and political budget cycles	145
6.2	Regulation and political budget cycles	147
6.3	Economic openness and political budget cycles	148
6.4	Marginal effects	149
6.1	Descriptive statistics (volatility)	152
6.2	Descriptive statistics (regulate)	153
6.3	Descriptive statistics (economic openness)	153
8.1	List of variables	193
8.2	Single party government	198
8.3	Unified and single party	200
8.4	Size of the largest party/ Distance	203
8.5	Marginal effects	204
8.6	Banzhaf index	207
A.8.1	Descriptive statistics: Main analysis (tables 1-3, full sample)	210
A.8.2	Descriptive statistics: Banzhaf index (table 5)	210
A.8.3	Countries	211
9.1	List of variables	218
9.2	Empirical reprise I: including vote intention	220
9.3	Empirical reprise II: excluding vote intention	222
10.1	Context and strategic debt	229

List of Figures

1.1	Deficits in election and non-election years	10
1.2	Public debt at the beginning and end of the financial crisis of 2007-2010 . . .	13
1.3	The dynamics of public debt in three OECD countries	17
1.4	Structure of the argument	25
3.1	Intercepts: Government support and expenditure growth in non-election years	61
3.2	Intercepts: Government support and expenditure growth in election years . .	61
3.3	Intercepts: PM support and expenditure growth in non-election years	64
3.4	Intercepts: PM support and expenditure growth in election years	64
4.1	Challenger advantage, polarisation, and the deficit	82
4.2	Schematic time-line of the budget process in OECD countries	85
4.3	Marginal effects of government popularity on the budget balance	95
5.1	CDS Yields and elections in Japan	102
5.2	Deficits and the cost of borrowing	107
5.3	The cost of borrowing: Germany and Greece	112
5.4	Marginal effect: Elections and sovereign risk (weak sample)	122
5.5	Marginal effect: Elections and T-bond yields	122
5.6	Marginal effect: Elections and CDS bid yields	123
6.1	Marginal effect: Elections and economic volatility	150
6.2	Marginal effect: Elections and regulation	150
6.3	Marginal effect: Elections and economic openness	151
7.1	Frequency of coalition government	157
7.2	The democratic circle	158
7.3	Coalition government and competence estimates	170
7.4	Party positions in a one-dimensional policy space	171
7.5	Share in government and the optimal deficit	175
8.1	Marginal effect of largest party (model 6, table 4)	205
8.2	Marginal effect of distance (1-2) (model 8, table 4)	205

Chapter 1

Introduction

1.1 Introduction

The United States debt, foreign and domestic,
was the price of liberty.

Alexander Hamilton

Alexander Hamilton wrote these words in the year 1790 in the *First Report on the Public Credit*, fourteen years after the United States' Declaration of Independence. He argued that public debt was the key to the young republic's liquidity, which in turn was necessary to 'cement more closely the Union of the States, to add security against foreign attack', as well as to 'promote the increasing respectability of the American name.' To Hamilton, the United States was the guarantor of civil liberties and public debt was an important source of revenue for a viable government. Almost two centuries and two decades later, his words decorate the homepage of the U.S. Bureau of the Public Debt.¹ They may serve to remind concerned Americans that the soaring public debt levels in response to the 2007 credit crunch are the price for averting a repetition of the Great Depression - or the liberty from economic hardship.

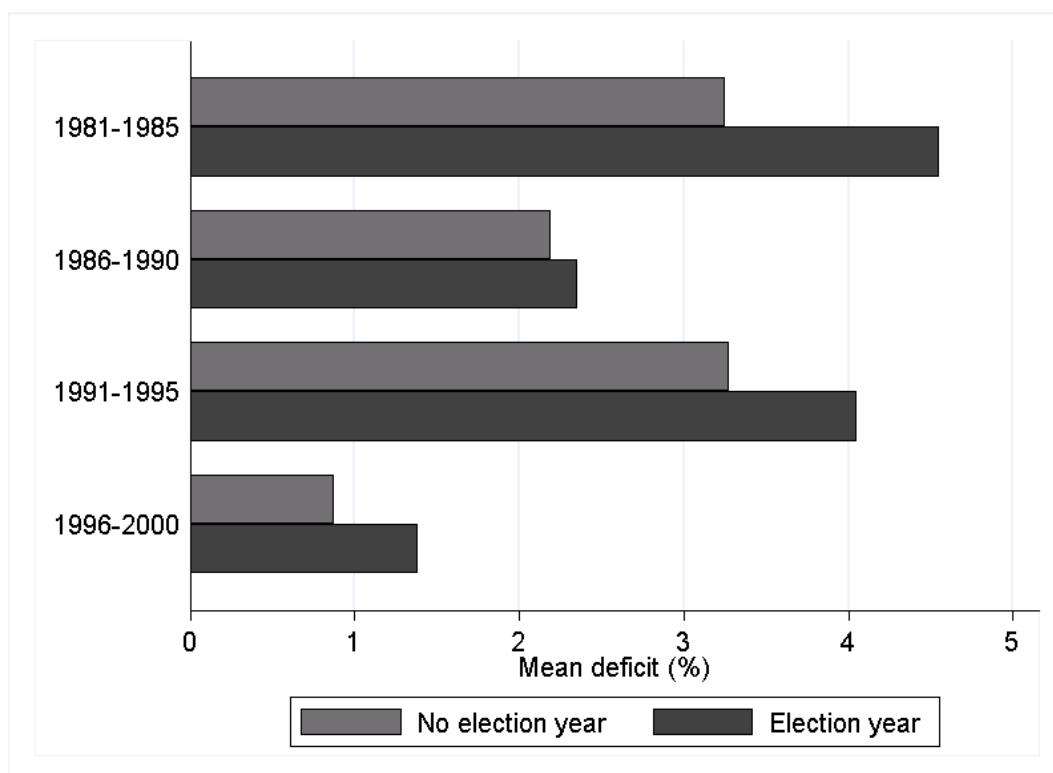
Both in political and economic terms, public debt is undoubtedly an important tool for governments to enhance national welfare. However, there is another way of interpreting Hamilton's words which makes their appearance on a government website ironic if not satirical. The competition for public office may tempt governments to exploit their authority over public debt in order to pursue policies that improve their electoral stakes. Such debt is socially sub-optimal since it benefits governments at the expense of society as a whole. In this light, public debt is an externality of elections and thus the price of a different, but fundamental, kind of liberty: the liberty of selecting a government, in other words democracy. It is this facet of public debt that this thesis focuses on by examining how electoral competition affects the dynamics of public debt.

The dynamics of public debt are approximated by the the budget balance, where a negative budget balance corresponds to a deficit.² Fluctuations in the budget balance during election times are referred to as political budget cycles. Figure 1.1 provides a first glimpse at

¹ Available at <<http://www.publicdebt.treas.gov>> - visited on 19 May 2009.

² Romer proposes to interpret the budget balance as the first derivative of the public debt stock. Romer, David (2001) *Advanced Macroeconomics*, New York, NY: McGraw-Hill/Irwin.

Figure 1.1: Deficits in election and non-election years



Note: Data obtained from the IMF's *2009 Economic Outlook*. Countries included in the figure are Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, UK, USA.

political budget cycles for countries included in the *2009 World Economic Outlook*, published by the International Monetary Fund (IMF).³ It indicates clearly that, between 1981 and 2000, on average the deficit tended to be higher in election years than in non-election years. However, it also shows that the magnitude of political budget cycles differs over time. The average difference between the deficit in election and non-election years was most pronounced between 1981 and 1985, while the smallest difference occurred between 1986 and 1990. The figure is a rather crude illustration of political budget cycles; yet it does suggest that there is variance in the their magnitude. What are the factors that determine the magnitude of the political budget cycle? This is the question this thesis aims to answer.

The answers that will be offered are based on a nuanced examination of governments' incentives to borrow before elections. These incentives are essentially driven by a cost-benefit analysis where public debt is the cost incurred in pursuit of the benefits of retaining office, such as prestige, income, or the ability to make policy. Two factors affect this analysis substantively. Firstly, if public office is the prize political candidates seek when running in

³ Available at <www.imf.org/external/pubs/ft/weo/2009/01/index.htm> - visited on 17 November 2009.

an election, the expected value they attach to it will determine the amount of effort they will devote to securing it. If public debt can be used as a strategic instrument for electoral gain, governments will be more likely to borrow the higher their expected utility from retaining office is - relative to the cost of public debt. The thesis will focus on three factors that affect this cost-benefit trade-off: government popularity, party polarisation, and sovereign risk.

Government popularity is an indicator for the likelihood of re-election. The more likely a government is to win an election, the higher will be the expected value of re-election.⁴ Conversely, the relative cost of borrowing increases as electoral defeat becomes more probable. In a situation where competing candidates do not differ in their policy platforms, governments are therefore most likely to increase the deficit before an election when the outcome is expected to be close. If the political system is polarised and candidates differ in their policy platforms this effect changes. For one, the ability to implement the preferred policy raises the value of holding office and thus the magnitude of the political budget cycle. But in addition, the incentive system may change. A government in a polarised system that is likely to lose may choose to borrow in order to finance its preferred policies, leaving the cost to its likely successor. Thus, in a polarised system, the deficit will increase in a government's likelihood of defeat. In this light, polarisation and government popularity are interdependent.

Government popularity and polarisation increase the expected value of holding office relative to the cost of borrowing. Sovereign risk affects the cost of public debt directly because a higher risk premium requires a higher yield to make government bonds more attractive. Higher borrowing costs decrease the relative benefit from strategic debt. Thus, sovereign risk dampens political budget cycles.

These considerations relate to a direct cost-benefit analysis of borrowing. A second factor that will affect this analysis, yet in a more indirect way, is the effectiveness of debt as a strategic instrument. If voters do not perfectly observe the budget balance, they might attribute increases in public expenditure to a more efficient execution of policy and reward the government at the polls for its competence - even though in truth this expenditure was financed with debt. The more effective debt is as a tool to feign competence the larger will be the relative benefit of borrowing, and the more pronounced will be the political budget cycle. The thesis will examine factors that diminish this effectiveness. Feigning competence can be construed as a signal that governments send to voters. If this signal gets blurred,

⁴Note that the expected utility from holding office is a positive function of the probability of re-election. For this reason, an increase in the likelihood of retaining office increases the expected value of re-election.

public debt becomes a less effective tool. Economic disturbances (caused by non-government actors) and shared governing responsibility both obstruct signal extraction and, as will be shown, dampen incentives to increase the deficit, and thus decrease the magnitude of the political budget cycle.

Each of the factors the thesis highlights, government popularity, polarisation, sovereign risk, economic disturbances, and coalition government, is part of the strategic context governments operate in. Context shapes their incentives to borrow before elections and for this reason the investigation of the relationship between electoral competition and the dynamics of public debt in this thesis is an analysis of context-conditional political budget cycles. Although this analysis builds on existing work, the inferences are novel. The theoretical argument highlights contextual features that have been explored at most to a limited extent in the existent literature; and the propositions and hypothesis derived in this thesis are bolstered by empirical analyses that partly rely on existing data sets but also on newly constructed variables. The thesis thus makes an important contribution to the understanding of politically motivated borrowing.

The remainder of this chapter proceeds as follows. The externalities from borrowing are a main motivation for this thesis; and they are also key to the argument, since they constitute a fundamental part of a government's cost-benefit analysis.⁵ The next section will thus explore the costs of public debt. The third section overviews explanations for the dynamics of public debt and provides an introduction to context-conditional political budget cycles. Section four outlines the argument this thesis advances in more detail, and section five explains and justifies the methods of inference. Section six discusses the contribution of the thesis to the public and academic discourse, whilst the seventh section concludes.

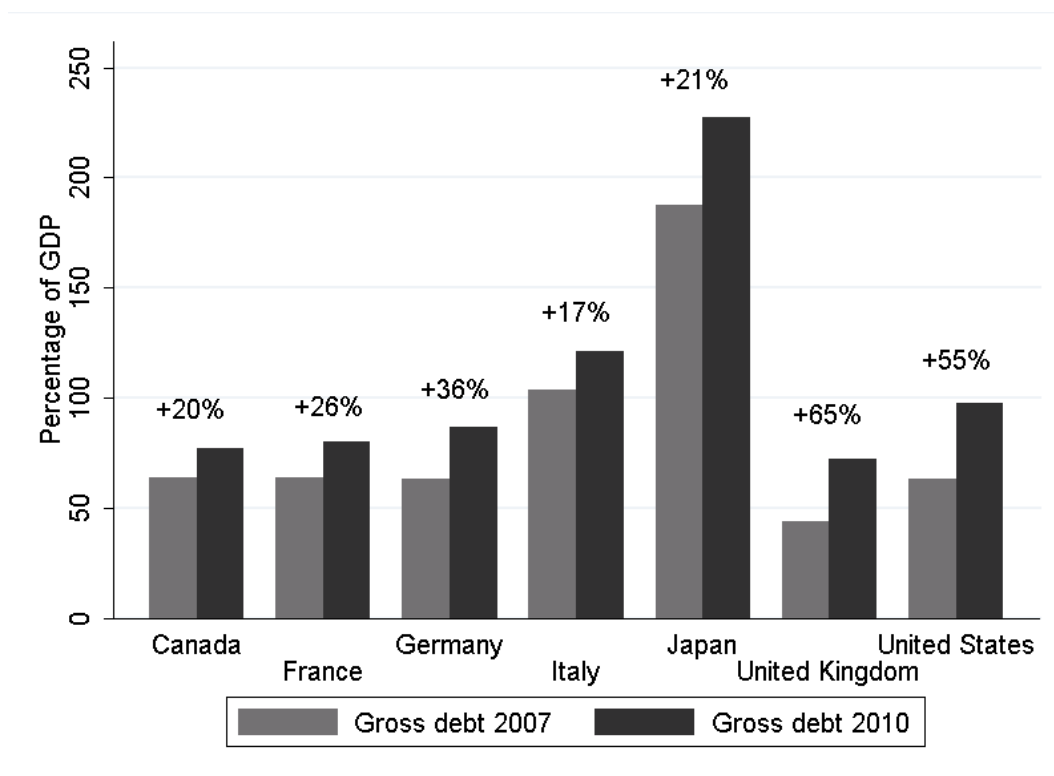
1.2 Exploring the Costs of Public Debt

Exploring the costs of public debt is topical in a time where many countries across the globe witnessed rising debt levels as a result of the fiscal response to the 2007-2010 financial and economic crisis.⁶ Figure 1.2 shows public debt data for selected member states of the

⁵The notion that borrowing is costly is a latent assumption in all models of political budget cycles employed in this thesis. For a direct treatment of the effect of the cost of public debt on strategic borrowing, see in particular chapter 5.

⁶In 2010, economic growth picked up in many countries, suggesting that an end to the economic crisis - that ensued after the 2007 credit crunch - was in sight. Yet the crisis may be prolonged beyond the year 2010. For example, in June 2010 the European Central Bank reckoned that banks in the euro area could confront another €195 billion in write-downs in 2010 and 2011, potentially impeding economic recovery;

Figure 1.2: Public debt at the beginning and end of the financial crisis of 2007-2010



Note: Data obtained from the IMF's *2009 Economic Outlook*.

Organisation for Economic Cooperation and Development (OECD) for 2007, the year before the crisis, and estimated data for the year 2010. These data are based on the IMF's *2009 World Economic Outlook*. All those countries see their debt-to-GDP ratios soar, with the smallest increase in Italy (+17%) and the largest increase in the United Kingdom (+65%). The resulting debt levels give cause for concern in all countries represented in figure 1.2. In most cases the debt-to GDP ratio is close to 100%. This essentially means that each country owes almost as much as it generates in value in a given year. In some countries the debt-to-GDP is well above 100%, most notably in Japan where public debt is more than twice the value of GDP. Debt levels of such magnitude are alarming and make it ever more important to understand the incentives that could increase these levels even further - especially if such increases are socially sub-optimal as in the case of political budget cycles.

The costs of public debt are diverse. Most notably, public debt is essentially postponed taxation since all public liabilities will have to be amortised with public funds in the future. For the United States, the National Debt Clock estimates for April 2010 that each citizen's share of the public debt amounts to approximately 42,000 U.S. dollars.⁷ However, the

The Economist (2010d) Waiting for the Big One, 5 June. Similarly, the possibility of sovereign default, as discussed below, might cause another recession in many countries.

⁷ Available at <http://www.brillig.com/debt_clock> - visited on 21 April 2010.

costs of public debt go beyond future tax increases. Firstly, public debt incurs interest obligations which have to be met. In Japan, the country with the highest debt level in the developed world, service costs amount to ¥22.4 trillion (\$204.7 billion, £123.4 billion), which corresponds to a quarter of the national budget in the fiscal year 2009/2010.⁸ This means that 25% of Japanese tax revenue is devoted to paying for the past and cannot be used for expenditure in the present. Given the high debt levels across the industrialised world, many countries will see a large portion of their taxes contributing to interest service.

Secondly, the level of public debt is positively correlated with default risk. The likelihood of a country's defaulting on its debt obligations increases the risk premium investors will demand when purchasing government bonds. This makes borrowing even more costly. Worse, if a country eventually does default the consequences are dramatic, as demonstrated in particular by the experience of several Latin American countries in the 1980s.⁹ The 2007-2010 financial and economic crisis shows that even developed countries are not immune to the possibility of default - most notably exemplified by the near-collapse of Iceland's finances that could only be rescued through last minute loans from the IMF and sympathetic countries, the downgrading of Spain's debt to AA+ by rating agency Fitch and the downgrading of Greek debt to 'junk status' by several rating agencies, resulting in a large-scale concerted bail-out from the European Union and the IMF in early 2010.¹⁰ Further increases in debt are particularly sensitive under such circumstances.¹¹

Thirdly, debt has adverse long-term consequences for economic growth. The traditional Keynesian view is that government borrowing increases competition for capital, thus raising the interest rate and crowding out investment. Lower investment implies a decrease in capital accumulation and consequently lower long-run growth. In modern macroeconomic theory, this link is not quite as pronounced. For example, in an economy that can be represented by the Ramsey-Cass-Koopmans model, the effect of changes in government expenditure depends on the expectation as to whether these changes are permanent or temporary.¹² In this model, a permanent change in government expenditure has no impact on investment; a temporary

⁸Kajimoto, Tetsushi (2008) Japan Debt Service Costs Seen at Record Y22.4 trln, *Reuters*, (URL: <http://www.reuters.com/article/bondsNews/idUST2659720080828>).

⁹See e.g. Eichengreen, Barry J. and Lindert, Peter H. (1992) *The International Debt Crisis in Historical Perspective*, Cambridge, MA: MIT Press.

¹⁰Even countries with reputations for prudent fiscal management have been affected. In October 2009, Standard & Poor's warned that the UK could lose its AAA rating; the United States is in a similar position but its case is less acute due to the dollar's strength as a reserve currency; *The Economist* (2009) Tomorrow's Burden, 24 October.

¹¹C/f the discussion in chapter 5.

¹²Ramsey, Frank P. (1928) A Mathematical Theory of Saving, *The Economic Journal*, Vol. 38, No. 152; Cass, David (1966) Optimum Growth in an Aggregative Model of Capital Accumulation: A Turnpike Theorem, *Econometrica*, Vol. 34, No. 4; Koopmans, Tjalling C. (1965) On the Concept of Optimal Growth, Cowles Foundation, Yale University.

change induces individuals to smoothen their consumption by saving less, which decreases investment and in turn economic growth. The empirical evidence suggests that deficits do raise long-term real interest rates, resulting in the crowding-out of private investment and lower growth.¹³ Yet even without crowding-out, the effect of public debt on long-run growth can be expected to be negative: public debt is postponed taxation and if taxes are distortionary they will inhibit long-run economic growth.

Lastly, public debt has normative welfare implications. Whether they are positive or negative thus lies in the eye of the beholder. By many standards of fairness the implications are negative. Public debt redistributes wealth in two ways. On the one hand it transfers resources from future taxpayers for current expenditure. Future generations have no representation in the political process that determines government borrowing; since future generations have no say over the tax liabilities they will incur, debt can be considered unfair. On the other hand, debt redistributes wealth from workers to capital holders. In the Ramsey-Cass-Koopmans model, a temporary increase in government expenditure through a real or expected tax increase reduces disposable income. Workers who wish to increase their income will have to work more, which exerts downward pressure on the real wage. If the increase is temporary, they will also decrease their savings which raises the return to capital. Generally, capital holders tend to be wealthy which means that public debt can indirectly aggravate inequality. Since public debt largely generates a windfall gain for capital holders at the expense of workers this can be construed as unfair. Yet, capital holders can also adversely be affected by public debt. Debt is often denoted in nominal terms which provides governments with an incentive to increase inflation and thus reduce the debt stock. Inflation decreases the value of savings and thus hurts capital holders - former U.S. president Ronald Reagan provides a famous normative assessment: "Inflation is as violent as a mugger, as frightening as an armed robber and as deadly as a hit man."

In sum, the costs of public debt include future tax liabilities, interest service obligations, higher default premiums and the risk of a default crisis, deteriorating prospects for long-run economic growth, and potentially adverse redistributive consequences. Since these costs are considerable, government borrowing must be prudent if it is to enhance national welfare. In most models of political budget cycles, public debt is a negative externality because the government does not internalise the cost of strategic borrowing for society as a whole.¹⁴ This

¹³Wachtel, Paul and Young, John (1987) Deficit Announcements and Interest Rates, *The American Economic Review*, Vol. 77, No. 5; Elmendorf, Douglas W. (1993) Actual Budget Deficit Expectations and Interest Rates, *Harvard Institute of Economic Research Working Papers*; Laubach, Thomas (2009) New Evidence on the Interest Rate Effects of Budget Deficits and Debt, *Journal of the European Economic Association*, Vol. 7, No. 4.

¹⁴The exception to this general undertone is Rogoff's argument that strategic debt is a signal to voters

thesis will shed light on the context that mediates governments' incentives for accumulating sub-optimal debt. In doing so, it builds on a long tradition of research aimed at explaining the dynamics of public debt.

1.3 Explaining the Dynamics of Public Debt

One of the key theories of the dynamics of public debt builds on the theory of consumption smoothing, as advocated by Modigliani, Brumberg, and Friedman.¹⁵ Their work posits that individuals are averse to income fluctuations. For this reason they save when their income is above and borrow when their income is below their expected average income, which is the essence of the famous *permanent income hypothesis*. Deficit finance is postponed taxation and should thus affect individual consumption behaviour similarly. However, debt amortisation may occur beyond a generation's expected lifetime. Leaving debt to future generations could raise the expected income and change consumption. Barro argues that individuals can be modeled as infinitely-lived if parents take into account the utility of their offspring.¹⁶ Given this assumption, the effects of debt and taxes on consumption are equivalent, known as Ricardian equivalence. If Ricardian equivalence holds, the main reason for deficit finance is tax smoothing. Barro maintains that taxes are distortionary which is why it is desirable to keep them constant by financing temporary shortfalls with deficits that will be amortised when tax revenues rise.¹⁷ Tax smoothing provides a good first empirical approximation of the dynamics of public debt.¹⁸

Figure 1.3 plots the budget balance (as a percentage of GDP) in three OECD countries: Switzerland, the United States, and Sweden.¹⁹ Switzerland shows the lowest variation in public debt. Although the figure does not include tax revenues the relative smoothness of the graph suggests that public debt is not systematically accumulated and should remain relatively stable. This is one of the key predictions of the tax smoothing hypothesis. The

that allows them to select a competent government. It remains questionable, however, whether this positive signaling effect offsets the negative welfare implications of public debt; Rogoff, Kenneth (1990) Equilibrium Political Budget Cycles, *The American Economic Review*, Vol. 80, No. 1.

¹⁵Modigliani, Franco and Brumberg, Richard (1954) Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data, In Kurihara, Kenneth K., editor *Post-Keynesian Economics*, New Brunswick, NJ: Rutgers University Press; Friedman, Milton (1957) *A Theory of the Consumption Function*, Princeton, NJ: Princeton University Press.

¹⁶Barro, Robert J. (1974) Are Government Bonds Net Wealth? *The Journal of Political Economy*, Vol. 82, No. 6.

¹⁷Barro, Robert J. (1979) On the Determination of the Public Debt, *The Journal of Political Economy*, Vol. 87, No. 5.

¹⁸Barro (1979) *The Journal of Political Economy* (as in n. 17); Poterba, James M. and Summers, Lawrence H. (1987) Finite Lifetimes and the Savings Effect of Budget Deficits, *Journal of Monetary Economics*, Vol. 20, No. 2.

¹⁹The data are taken from Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

Figure 1.3: The dynamics of public debt in three OECD countries



Note: Data obtained from Brender and Drazen (2005).

budget balance in the United States has a significantly higher variance than Switzerland. The downward spikes in the 1970s are likely to be caused by a series of oil shocks in 1973 and 1979. The relatively low levels of the budget balance during the 1980s could result from president Reagan's pursuit of a renewed arms race with the Soviet Union culminating in the collapse of Communism in Europe. Both economic shocks and Cold War military expenditure are commensurate with tax smoothing, since these are shocks to national income that are expected to be temporary. Of the three countries in figure 1.3, Sweden has the highest variance in the budget balance. Particularly noteworthy is a large downward spike in the early 1990s which most likely represents Sweden's own financial crisis of 1993. A banking crisis is a temporary shock to national income, and again, tax smoothing is a prime explanation for the deficit.

The variation in figure 1.3 is large and it seems unlikely that tax smoothing can account for it entirely. In particular, debt levels started to rise substantially during the 1960s and 1970s.²⁰ These developments cast doubt on a theory that predicts stable debt levels.

²⁰Alesina, Alberto and Perotti, Roberto (1995) *The Political Economy of Budget Deficits*, Staff Papers-International Monetary Fund, No. 4637; Roubini, Nouriel and Sachs, Jeffrey D. (1989b) Political and Economic Determinants of Budget Deficits in the Industrial Democracies, *European Economic Review*, Vol. 33, No. 5.

Several studies thus examined conditions under which Ricardian equivalence may fail, thus altering the predictions for tax smoothing.²¹ Yet, increasingly the literature turned away from consumption behaviour and toward the *political* determinants of debt accumulation. Governments are ultimately responsible for fiscal policy. Therefore, understanding their political motives is crucial to explaining the empirical divergence from the economically prudent theory of tax smoothing.

Generally, the literature on the political determinants of public borrowing can be divided into two categories. Studies in the first category concentrate in particular on *partisanship*. Boix provides a comprehensive study of the impact of partisanship on deficits.²² He tests two propositions: first, he examines whether left-wing governments in corporatist countries can pursue non-inflationary borrowing because their strong ties to labour movements will moderate increases in wages. Second, he explores the effect of economic ideology on deficits, whereby left-wing governments are expected to implement Keynesian, counter-cyclical policies to stimulate demand. Boix shows that the evidence for both propositions is rather weak. His findings are reflected by numerous other studies, surveyed by Franzese.²³ This comprehensive survey concludes that the “record shows the strongest partisan ties to total spending or revenues, and stronger ties to social or welfare policies than to fiscal-deficit policy.”²⁴ Thus, left-wing governments are not necessarily more likely to borrow than right-wing governments.

In fact, there are some studies that predict the opposite, namely that *right-wing* governments are more likely to borrow, at least for strategic reasons.²⁵ The empirical evidence for these model is relatively limited, however.²⁶ Partisanship will thus not be the main emphasis of this thesis. Rather, the thesis will focus on the second category of the political determinants of public debt, focusing on *institutions* and related contextual features. North defines institutions as “the rules of the game in a society or, more formally, [...] the humanly

²¹See, e.g., Hubbard, R. Glenn and Judd, Kenneth L. (1986) Liquidity Constraints, Fiscal policy, and Consumption, *Brookings Papers on Economic Activity*, Vol. 1; Bernheim, B. Douglas (1987) Ricardian Equivalence: An Evaluation of Theory and Evidence, *NBER Macroeconomics Annual*, Vol. 2; Barsky, Robert B., Mankiw, N. Gregory and Zeldes, Stephen P. (1986) Ricardian Consumers with Keynesian Propensities, *The American Economic Review*, Vol. 76, No. 4; Cukierman, Alex and Meltzer, Allan H. (1989) A Political Theory of Government Debt and Deficits in a Neo-Ricardian Framework, *The American Economic Review*, Vol. 79, No. 4.

²²Boix, Carles (2000) Partisan Governments, the International Economy, and Macroeconomic Policies in Advanced Nations, 1960-93, *World Politics*, Vol. 53.

²³Franzese Jr, Robert J. (2002) Electoral and Partisan Cycles in Economic Policies and Outcomes, *Annual Review of Political Science*, Vol. 5, No. 1.

²⁴Franzese Jr (2002) (as in n. 23), p.398

²⁵These studies will be reviewed in more detail in chapter 2 of this thesis.

²⁶For evidence from a selection of OECD countries and Sweden respectively, see Alt, James E. and Lassen, David Dreyer (2006a) Fiscal Transparency, Political Parties, and Debt in OECD Countries, *European Economic Review*, Vol. 50, No. 6; Pettersson-Lidbom, Per (2001) An Empirical Investigation of the Strategic Use of Debt, *The Journal of Political Economy*, Vol. 109, No. 3.

devised constraints that shape human interaction.”²⁷ Thus, institutions structure incentives and will play an important role for governments’ incentives to borrow.

Institutions can explain variations in public debt both across countries and time. For cross-country variation, the focus lies predominantly with time-invariant institutions. The literature is vast and a few examples shall suffice to illustrate the nature of the arguments. Weingast *et al.* concentrate on a polity’s degree of centralisation, emphasising the role of the common pool source problem for the size of the budget.²⁸ They argue that decision-makers in a de-centralised system are only concerned with delivering public goods to their immediate constituency and do not internalise the consequences for the overall budget. This can result in higher deficits, as shown in a number of empirical studies.²⁹ Another key institutional feature that influences deficit levels across countries are legal debt ceilings. There is empirical evidence for the claim that incentives to accumulate debt can be dampened by legal fiscal ceilings which successfully prevent the explosion of public debt.³⁰ Lastly, political systems that foster multi-party government are likely to have relatively high levels of public debt. Alesina and Drazen argue that coalition partners may engage in a ‘war of attrition’ over the deficit.³¹ The model predicts that in particular deficit reductions are controversial which can result in an upward bias of public debt. The more parties are in government and the more equally voting power is dispersed, the more difficult it will be to reduce the deficit.³² These examples illustrate that different levels of public debt across countries can to a large extent be explained with reference to time-invariant institutions.

²⁷North, Douglass C. (1990) *Institutions, Institutional Change, and Economic Performance*, Cambridge: Cambridge University Press, p.3. See also Tsebelis, George (1991) *Nested Games: Rational Choice in Comparative Politics*, University of California Press.

²⁸Weingast, Barry R., Shepsle, Kenneth A. and Johnsen, Christopher (1981) The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics, *The Journal of Political Economy*, Vol. 89, No. 4.

²⁹Hagen, Jürgen von (1992) Budgeting Procedures and Fiscal Performance in the European Communities, *European Economy-Economic Papers*; Hagen, Jürgen von and Harden, Ian J. (1994) National Budget Processes and Fiscal Performance, *European Economy Reports and Studies*, Vol. 3; Hagen, Jürgen von and Harden, Ian J. (1995) Budget Processes and Commitment to Fiscal Discipline, *European Economic Review*, Vol. 39, No. 3-4; Molander, Per (2000) Reforming Budgetary Institutions: Swedish Experiences, In Strauch, Rolf R. and Hagen, Jürgen von, editors *Institutions, Politics and Fiscal Policy*, Dordrecht: Kluwer Academic Publishers; Velasco, Andrés (2000) Debts and Deficits with Fragmented Fiscal Policymaking, *Journal of Public Economics*, Vol. 76, No. 1; Woo, Jaejoon (2003) Economic, Political, and Institutional Determinants of Public Deficits, *Journal of Public Economics*, Vol. 87, No. 3-4.

³⁰Hagen, Jürgen von (1991) A Note on the Empirical Effectiveness of Formal Fiscal Restraints, *Journal of Public Economics*, Vol. 44; Poterba, James M. (1996) Budget Institutions and Fiscal Policy in the US States, *The American Economic Review*, Vol. 86, No. 2; Alesina, Alberto and Perotti, Roberto (1996) Fiscal Discipline and the Budget Process, *The American Economic Review*, Vol. 86, No. 2.

³¹Alesina, Alberto and Drazen, Allan (1991) Why Are Stabilizations Delayed? *The American Economic Review*, Vol. 81, No. 5.

³²Roubini, Nouriel and Sachs, Jeffrey D. (1989a) Fiscal Policy, *Economic Policy*, Vol. 8, No. 4; Roubini, Nouriel et al. (1989) Government Spending and Budget Deficits in the Industrial Countries, *Economic Policy*, Vol. 8, No. 4; De Haan, Jakob and Sturm, Jan-Egbert (1997) Political and Economic Determinants of OECD Budget Deficits and Government Expenditures: A Reinvestigation, *European Journal of Political Economy*, Vol. 13, No. 4; Huber, Gerald, Kocher, Martin and Sutter, Matthias (2003) Government Strength, Power Dispersion in Governments and Budget Deficits in OECD-Countries: A Voting Power Approach, *Public Choice*, Vol. 116, No. 3; Perotti, Roberto and Kontopoulos, Yianos (2002) Fragmented Fiscal Policy, *Journal of Public Economics*, Vol. 86, No. 2.

To explain temporal variation in (political) public debt, the literature focuses predominantly on elections. Elections are the key constituent part of a democratic political system which is (relatively) time-invariant. Yet, incentive structures can differ between election and non-election times, which induces temporal variation in policy. To appreciate this difference, it is helpful to ponder the nature of elections. From Downs to Dahl, students of democracy have stressed that elections are the gate to power.³³ Political candidates compete for the electorate's votes before an election in order to pass through this gate. But how do voters choose their preferred candidate?

Downs suggests analysing the vote choice in a similar way as consumer decisions in economics: like a consumption choice, the vote choice is based on expected utility, yet not from a good, but from the policies associated with a political candidate.³⁴ Fair and Kramer take this argument further by examining the voters' utility function.³⁵ They argue that economic considerations are the key determinant of the vote choice.³⁶ Yet it was Barro and Ferejohn in two separate articles who provided a pathbreaking theoretical approach that links economic performance to voting.³⁷ They analyse democratic government in a principal-agent framework where voters are the principal and the government is the agent. Elections then serve as a punishment instrument to oust the incumbent government from power when its management of the economy was unsatisfactory. Governments would thus be constrained in their ability to seek rents in order to pass the necessary performance threshold at the next election.

If economic performance is a key determinant of the vote choice, governments have an incentive to boost economic performance before an election to improve their electoral stakes. This is the key idea in the theory of political business cycles, as proposed by Nordhaus.³⁸ A political business cycle emerges when governments loosen monetary policy in order to raise output and employment before an election. The increase in the money supply will result in higher inflation. However, if inflation only increases after the election, governments may be

³³Downs, Anthony (1957) *An Economic Theory of Democracy*, New York, NY: Harper; Dahl, Robert A. (1964) *Who Governs?* New Haven, CT: Yale University Press; Dahl, Robert A. (1971) *Pluralism and Democracy: Participation and Opposition*, New Haven, CT: Yale University Press.

³⁴Downs (1957) (as in n. 33). For earlier approaches to decision-making in the framework of utility maximisation, see e.g. Neumann, John von and Morgenstern, Oskar (1947) *Theory of Games and Economic Behavior*, Princeton, NJ: Princeton University Press.

³⁵Fair, Ray C. (1978) The Effect of Economic Events on Votes for President, *Review of Economics and Statistics*, Vol. 60, No. 2; Kramer, Gerald H. (1971) Short-Term Fluctuations in US Voting Behavior, 1896-1964, *The American Political Science Review*, Vol. 65, No. 1.

³⁶For a more thorough discussion of economic voting, see in particular chapter 6.

³⁷Barro, Robert J. (1973) The Control of Politicians: An Economic Model, *Public Choice*, Vol. 14, No. 1; Ferejohn, John (1986) Incumbent Performance and Electoral Control, *Public Choice*, Vol. 50, No. 1.

³⁸Nordhaus, William D. (1975) The Political Business Cycle, *The Review of Economic Studies*, Vol. 42, No. 2; see also MacRae, C. Duncan (1977) A Political Model of the Business Cycle, *The Journal of Political Economy*, Vol. 85, No. 2.

rewarded at the polls for the temporary boost in economic performance. In periods close to elections, governments have an incentive to exploit the voters' short-sightedness (myopia) to exaggerate their record in office. This is how election times differ from non-election times.

The theory of political business cycles rests on a statistical relationship discovered by Phillips in 1958, suggesting a trade-off between unemployment and inflation.³⁹ This empirical relationship breaks down, however, when it becomes the basis for policy. Friedman and Phelps first pointed out that nominal variables like the money supply could not permanently affect real variables, such as unemployment.⁴⁰ For this reason, the Phillips curve cannot capture a permanent trade-off. In his famous critique, Lucas explained that rational actors will take into account all available information on the economy.⁴¹ If unemployment falls below a certain level (the so-called natural rate), inflation rises. As long as policy-makers retain it below the natural rate, economic agents will revise their expectations on inflation upward, resulting in a steady increase in inflation.⁴² Accordingly, politicians cannot exploit this empirical trade-off for policy since only unanticipated demand shocks can give rise to a Phillips curve relationship.⁴³ The theory of political business cycles thus fell victim to the rational-expectations revolution.⁴⁴

However, the key idea of political business cycles, namely governments' incentives to exploit policy in pursuit of electoral gain, retained its appeal. Rather than looking at monetary policy and the Phillips curve, attention shifted to fiscal policy.⁴⁵ To differentiate

³⁹Phillips, Alban W. (1958) The Relationship between Unemployment and the Rate of Change of Money Wages in the United Kingdom, *Economica*, Vol. 25.

⁴⁰Friedman, Milton (1968) The Role of Monetary Policy, *The American Economic Review*, Vol. 58, No. 1; Phelps, Edmund S. (1968) Money-Wage Dynamics and Labor-Market Equilibrium, *The Journal of Political Economy*, Vol. 76, No. 4.

⁴¹Lucas, Robert (1976) Econometric Policy Evaluation: A Critique, *Carnegie-Rochester Conference Series on Public Policy*, Vol. 1.

⁴²For a more thorough discussion of voter expectations see in particular chapter 3.

⁴³Barro, Robert J. (1976) Rational Expectations and the Role of Monetary Policy, *Journal of Monetary Economics*, Vol. 2, No. 1; Sargent, Thomas J. and Wallace, Neil (1975) "Rational" Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule, *The Journal of Political Economy*, Vol. 83, No. 2; Chappell Jr, Henry W. and Keech, William R. (1985) A New View of Political Accountability for Economic Performance, *The American Political Science Review*, Vol. 79, No. 1.

⁴⁴Another victim of the rational-expectations revolution was Hibbs's model of partisan business cycles. Hibbs argued that left-wing parties favoured lower unemployment over inflation whilst the reverse was true for right-wing parties. For this reason, one would expect fluctuations in unemployment and inflation depending on the ideology of the governing party that an election brings to power. His model was significantly improved by Alesina and Rosenthal who gave it stronger analytical foundations. See Hibbs Jr, Douglas A. (1977) Political Parties and Macroeconomic Policy, *The American Political Science Review*, Vol. 71, No. 4; Hibbs, Douglas A. (1987) *The American Political Economy: Macroeconomics and Electoral Politics*, Cambridge, MA: Harvard University Press and Alesina, Alberto and Rosenthal, Howard (1995) *Partisan Politics, Divided Government, and the Economy*, Cambridge: Cambridge University Press.

⁴⁵This is not to say that political business cycle theory has completely vanished from the research agenda. Backus and Driffil, for example, argue that political business cycles can still emerge when only some government types inflate the economy before elections. Since voters cannot observe the incumbent's type, a pre-election boom could be the result of good economic management. In this sense, political business cycles are probabilistic; see Backus, David and Driffill, John (1985) Inflation and Reputation, *The American Economic Review*, Vol. 75, No. 3. For recent empirical studies of political business cycles see, e.g. Franzese Jr., Robert J. (2002) *Macroeconomic Policies of Developed Democracies*, Cambridge: Cambridge University Press; Grier, Kevin B. (1989) On the Existence of a Political Monetary Cycle, *American Journal of Political Science*, Vol. 33, No. 2; Alesina, Alberto and Roubini, Nouriel (1992a) Political Cycles in OECD

models predicting fluctuations in the budget balance from the theory of political business cycles, Rogoff coined the term of political *budget* cycles.⁴⁶ Theories of political budget cycles are consistent with rational expectations. They will be reviewed in depth in the following chapter, chapter 2.

Political budget cycles are an empirical regularity.⁴⁷ The occurrence of political budget cycles was tested in as diverse setting as the European Union,⁴⁸ the United Kingdom,⁴⁹ the United States,⁵⁰ Turkey,⁵¹ India,⁵² Latin American countries,⁵³ Canadian provinces,⁵⁴ Swedish provinces,⁵⁵ Russian provinces,⁵⁶ even Chinese provinces,⁵⁷ and large cross-sections of developed and developing countries⁵⁸. Persson and Tabellini arguably provide the most comprehensive analysis, presenting evidence of political budget cycles across different regime types.⁵⁹ Although political budget cycles seem to occur in virtually all democracies, recent

Economies, *The Review of Economic Studies*, Vol. 59, No. 4; Alesina, Alberto, Roubini, Nouriel and Cohen, Gerald D. (1997) *Political Cycles and the Macroeconomy*, Cambridge, MA: MIT Press.

⁴⁶Rogoff (1990) *The American Economic Review* (as in n. 14).

⁴⁷See Drazen for an overview of political business and budget cycles; Drazen, Allan (2000) The Political Business Cycle After 25 Years, *NBER Macroeconomics Annual*, Vol. 15.

⁴⁸Hallerberg, Mark and Strauch, Rolf (2002) On the Cyclicity of Public Finances in Europe, *Empirica*, Vol. 29, No. 3; Hallerberg, Mark, Strauch, Rolf R. and Hagen, Jürgen von (2009) *Fiscal Governance in Europe*, Cambridge: Cambridge University Press.

⁴⁹Schultz, Kenneth A. (1995) The Politics of the Political Business Cycle, *British Journal of Political Science*, Vol. 25, No. 1; Price, Simon (1998) Comment on 'The Politics of the Political Business Cycle', *British Journal of Political Science*, Vol. 28, No. 1.

⁵⁰Tufte, Edward R. (1978) *Political Control of the Economy*, Princeton, NJ: Princeton University Press; Alesina, Alberto (1988) Macroeconomics and Politics, *NBER Macroeconomics Annual*, Vol. 3; Alt, James E. and Rose, Shanna S. (2007) Context-Conditional Political Budget Cycles, In Boix, Carles and Stokes, Susan C., editors *The Oxford Handbook of Comparative Politics*, Oxford, New York, NY: Oxford University Press; Ladewig, Jeffrey W. (2008) Housing Starts and the Political Business Cycle, *American Politics Research*, Vol. 36, No. 5.

⁵¹Krueger, Anne O. and Turan, Ilter (1993) The Politics and Economics of Turkish Policy Reform in the 1980's, In Bates, Robert H. and Krueger, Anne O., editors *Political and Economic Interactions in Economic Policy Reform: Evidence from Eight Countries*, Oxford: Basil Blackwell.

⁵²Karnik, Ajit (1990) Elections and Government Expenditures: The Indian Evidence, *Journal of Quantitative Economics*, Vol. 6; Sen, Kunal and Vaidya, Rajendra R. (1996) Political Budget Cycles in India, *Economic and Political Weekly*, Vol. 31, No. 30; Lalvani, Mala (1999) Elections and Macropolicy Signals: Political Budget Cycle Hypothesis, *Economic and Political Weekly*, Vol. 34, No. 37; Khemani, Stuti (2004) Political Cycles in a Developing Economy: Effect of Elections in the Indian States, *Journal of Development Economics*, Vol. 73, No. 1.

⁵³Ames, Barry (1990) *Political Survival: Politicians and Public Policy in Latin America*, Berkeley, CA: University of California Press; Whitehead, Lawrence (1990) Political Explanations of Macroeconomic Management: A Survey, *World Development*, Vol. 18, No. 8; Remmer, Karen L. (1993) The Political Economy of Elections in Latin America, 1980-1991, *The American Political Science Review*, Vol. 87, No. 2; Angeles Gonzalez, Maria de los (2002) Do Changes in Democracy Affect the Political Budget Cycle? Evidence from Mexico, *Review of Development Economics*, Vol. 6, No. 2.

⁵⁴Reid, Bradford G. (1998) Endogenous Elections, Electoral Budget Cycles and Canadian Provincial Governments, *Public Choice*, Vol. 97, No. 1.

⁵⁵Petersson-Lidbom (2001) (as in n. 26).

⁵⁶Akhmedov, Akhmed and Zhuravskaya, Ekaterina (2004) Opportunistic Political Cycles: Test in A Young Democracy Setting, *Quarterly Journal of Economics*, Vol. 119, No. 4.

⁵⁷Guo, Gang (2009) China's Local Political Budget Cycles, *American Journal of Political Science*, Vol. 53, No. 3.

⁵⁸Alesina, Alberto and Roubini, Nouriel (1992b) Political Cycles in OECD Economies, *The Review of Economic Studies*, Vol. 59, No. 4; Alesina, Roubini and Cohen (1997) (as in n. 45); Schuknecht, Ludger (1996) Political Business Cycles and Fiscal Policies in Developing Countries, *Kyklos*, Vol. 49, No. 2; Schuknecht, Ludger (2000) Fiscal Policy Cycles and Public Expenditure in Developing Countries, *Public Choice*, Vol. 102, No. 1.

⁵⁹Persson, Torsten and Tabellini, Guido E. (2003) *The Economic Effects of Constitutions*, Cambridge, MA: MIT Press.

debate has shifted to the factors that moderate their magnitude.

Again, institutions are at the centre of this debate and recent research into the factors that condition the magnitude of political budget cycles to an extent synthesises the analysis of time-invariant and time-variant institutions. Buchanan and Wagner's work belongs to early studies of the political determinants of public debt. They suggested that Keynesian economics provided a pretense for governments to abandon austerity in favour of looser fiscal policy, explaining the increase in debt levels during the 1960s and 1970s.⁶⁰ Voters, they argued, were subject to a 'fiscal illusion' since they underestimated the cost of borrowing and therefore failed to keep fiscal policy in check. Rational voters are unlikely to form systematically incorrect expectations, hence the fiscal illusion theory was another victim of the rational expectations revolution. However, recent work has revived this idea in the context of political budget cycles. Alt and Lassen show that fiscal transparency improves the voters' ability to monitor the government and thus reduces the magnitude of the political budget cycle.⁶¹

The work on fiscal transparency and political budget cycles feeds into a larger literature that aims to explain differences in the magnitude of strategic debt in developed and developing countries. Brender and Drazen argue that the experience with democratic institutions is important for voters to monitor fiscal policy.⁶² Thus, the older these institutions are, the more experienced voters are, and the smaller is the magnitude of political budget cycles. This argument is rather crude and Shi and Svensson provide a more nuanced explanation.⁶³ They highlight two factors that differentiate developing from developed countries. On the one hand, they argue that citizens in developed countries have better access to independent media, which improves the ability to monitor performance and lowers strategic debt. On the other hand, developing countries have higher levels of corruption, which raises the benefits from retaining office and thus the motivation to borrow before elections. Taken together, the two studies draw attention to institutional differences in developing and developed countries and their impact on political budget cycles.

Indeed, the study of institutions has become the main focus for the study of political

⁶⁰Buchanan, James M. and Wagner, Richard.E. (1977) *Democracy in Deficit: The Political Legacy of Lord Keynes*, New York, NY: Academic Press. See also Wagner, Richard. E. (1976) Revenue Structure, Fiscal Illusion, and Budgetary Choice, *Public Choice*, Vol. 25, No. 1.

⁶¹Alt and Lassen (2006a) *European Economic Review* (as in n. 26); Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3. Franzese advances a similar argument with respect to the complexity of the tax structure but finds no evidence of an impact on political budget cycles. Franzese Jr. (2002) (as in n. 45).

⁶²Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 19).

⁶³Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9.

budget cycles. For example, de los Angeles Gonzalez shows for the case of Mexico that political budget cycles were dampened in periods of relatively authoritarian government, which is an intuitive argument since strategic debt is the consequence of electoral competition.⁶⁴ Thus democracy in itself is an institution that moderates the use of strategic debt. Other studies in this area of research have in particular looked at how institutions constrain governments to borrow before election. Rose shows that fiscal rules (legal debt ceilings) can reduce the magnitude of political budget cycles.⁶⁵ Saporiti and Streb argue for presidential systems that divided government suppresses public debt.⁶⁶ Clark *et al.* show that floating exchange rates reduce governments' fiscal autonomy and thus minimise strategic debt.⁶⁷ This thesis will partly build on this research tradition but aim to provide a wholistic argument under what conditions governments will borrow before elections by closely examining both the costs and benefits from borrowing, as well as the effectiveness of strategic debt under different scenarios.

In line with the literature on institutions, the thesis will examine two institutional factors that mediate incentives for strategic debt: party polarisation and coalition government. Both are related to the number of parties in parliament, which is partly determined by the electoral system.⁶⁸ However, the other three factors this thesis examines, government popularity, sovereign risk, and economic disturbances (in particular with respect to economic volatility), are not institutional factors since they are not immediate constraints of human design.⁶⁹ The thesis shows that they are important forces structuring governments' incentives and should thus be included in the analysis of strategic borrowing. They are not institutions but they also contribute to the strategic context in which governments operate. For this reason, this is a thesis on *context*-conditional political budget cycles.

⁶⁴de los Angeles Gonzalez (2002) (as in n. 53)

⁶⁵Rose, Shanna S. (2006) Do Fiscal Rules Dampen the Political Business Cycle? *Public Choice*, Vol. 128, No. 3.

⁶⁶Saporiti, Alejandro and Streb, Jorge M. (2008) Separation of Powers and Political Budget Cycles, *Public Choice*, Vol. 137, No. 1.

⁶⁷Clark, William Roberts and Hallerberg, Mark (2000) Mobile Capital, Domestic Institutions, and Electorally Induced Monetary and Fiscal Policy, *The American Political Science Review*, Vol. 94, No. 2. See also comments by Leertouwer, Erik and Maier, Philipp (2001) Who Creates Political Business Cycles: Should Central Banks Be Blamed? *European Journal of Political Economy*, Vol. 17, No. 3; Leertouwer, Erik and Maier, Philipp (2003) International and Domestic Constraints on Political Business Cycles in OECD Economies: A Comment, *International Organization*, Vol. 56, No. 01.

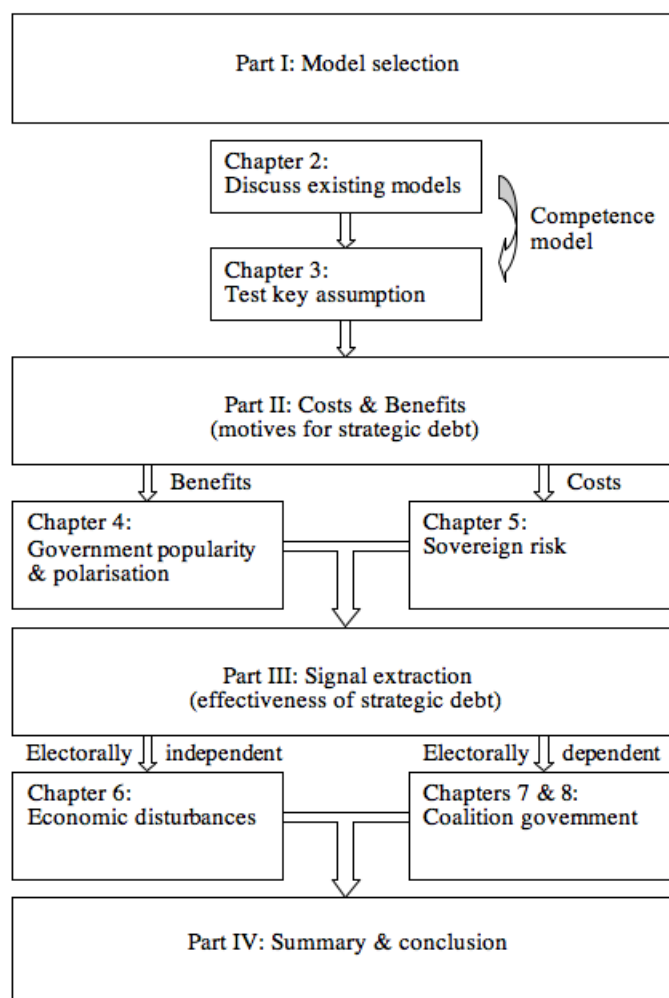
⁶⁸Duverger, Maurice (1954) *Political Parties: Their Organization and Activity in the Modern State*, New York, NY: Methuen; Sartori, Giovanni (1976) *Parties and Party Systems: A Framework for Analysis*, Cambridge: Cambridge University Press; Sartori, Giovanni (1997) *Comparative Constitutional Engineering: An Inquiry into Structures, Incentives, and Outcomes*, New York, NY: New York University Press; Cox, Gary W. (1997) *Making Votes Count: Strategic Coordination in the World's Electoral Systems*, Cambridge: Cambridge University Press.

⁶⁹Chapter 5 will show, however, that sovereign risk is at least to an extent the result of institutional design.

1.4 The Argument

Figure 1.4 illustrates the structure of the argument this thesis puts forward. It shows that this thesis consists of four parts, each represented by large rectangles. Part I will set the stage by deriving the theoretical basis for the thesis. Chapter 2 will discuss existing theoretical models of political budget cycles and evaluate the extent to which they are suitable as a basic model that can be extended to construct the theoretical argument in subsequent chapters.⁷⁰ The chapter will conclude that a competence-based moral hazard model of political budget cycles is the most suitable contender. To bolster the selection of this model empirically, chapter 3 will examine its core assumption which posits that voters *expect* increases in the deficit. The evidence is supportive of the model which corroborates the justification for the model choice.

Figure 1.4: Structure of the argument



⁷⁰Extending existing models is a common approach in both economics and formal political science. See, e.g. Romer (2001) (as in n. 2), p.3.

Part II will then begin the analysis of how context shapes the magnitude of political budget cycles. This part distinguishes itself from part III in that it explores governments' intrinsic *motives* for strategic debt in the first place. The more governments seek re-election, i.e. the greater the benefits from holding office are relative to the cost of borrowing, the more they will be willing to exploit the properties of public debt as a strategic instrument. This contrasts with part III which looks at the *effectiveness* of public debt as a strategic fiscal policy tool. If public debt is an instrument to suggest voters that the government is competent it will be more effective the easier it is for voters to extract this signal.⁷¹ Certainly, the two parts are related: if public debt is an effective strategic tool, it is also relatively inexpensive and will thus affect the cost-benefit analysis of governments. However, there is an important conceptual difference: if governments do not have a motive to borrow strategically, they will not have to ponder its effectiveness. In this light, strategic borrowing is a two-stage process which is reflected in this structure of part II which focuses on governments' cost-benefit calculus, and part III which examines under what circumstances voters will be better able to extract competence signals.

Substantively, part II will provide the first examination in this thesis of how context influences the magnitude of political budget cycles. Chapter 4 will show that governments' incentive structures differ before elections depending on their level of popularity. If they have a realistic chance of winning the election, they have an incentive to exploit fiscal policy in order to feign administrative competence. If they are unpopular and anticipate defeat, they have an incentive to borrow in order to increase preferred expenditure before the election whilst leaving the cost to the likely successor. It will be shown that party polarisation mediates between these two different incentive systems. If party polarisation is low, feigning competence dominates the incentive to increase preferred expenditure at the expense of the successor. The opposite holds for high polarisation.

Whilst chapter 4 emphasises the trade-off between costs and benefits of re-election with a particular emphasis on the *benefits*, chapter 5 will focus on the costs of strategic debt. As discussed above, the costs of public debt are considerable and politicians are likely to factor this cost into their decisions. The chapter will look at the role of sovereign risk which is a key determinant of the cost of borrowing and argue that the more expensive it is to borrow the smaller will be the political budget cycle.

⁷¹It should be noted that the use of the term 'signal' in this case does not necessarily result from a theoretical signaling game. Signals in this case should be understood more widely as the information a government wishes to convey to voters. This reasoning is commensurate with the related literature, see, e.g., Duch, Raymond M. and Stevenson, Randolph T. (2008) *The Economic Vote: How Political and Economic Institutions Condition Election Results*, Cambridge: Cambridge University Press.

Part III contains three chapters, all of which will examine as to how context conditions a government's ability feign competence, i.e. the effectiveness of debt as a strategic instrument. Competence signals can be blurred when multiple decision makers have an influence over a policy outcome. Duch and Stevenson divide these sources into two categories: *electorally dependent decision makers*, they argue, are "elected officials that comprise the national government and the bureaucracy that is responsible to them."⁷² *Nonelectorally dependent decision makers*, on the other hand, refer to "everyone else whose decisions might impact on the economy, including individuals, firms, interest groups, nonelectorally dependent (entrenched) bureaucrats, foreign leaders, the WTO, and many more."⁷³ This thesis follows this distinction.

First, it will look at nonelectorally dependent decision makers. Economic volatility is the result of many influences which cannot be clearly traced back to government competence. In a sense, economic volatility is the result of one aggregate competence shock of all actors involved in the real economy. The more volatile the economy is, the more difficult it is for voters to infer whether a boost in competence results from a positive shock to revenue (which is a percentage of GDP) or from a shock to administrative efficiency. Thus, higher economic volatility dampens the political budget cycle, as shown in chapter 6. Similarly, the more nonelectorally dependent actors there are in the economy, the more difficult it is for voters to extract competence signals since they cannot easily infer who is responsible for aggregate shocks they observe. Thus, political budget cycles will also decrease in the number of non-elected actors.

Electorally dependent decision makers are mainly governments. This thesis will focus in particular on coalition government and examine how shared responsibility in policy affects signal extraction. It will be demonstrated that coalition governments incur larger pre-election debts and that larger parties have greater incentives to borrow before elections than smaller parties. The analysis is complex which is why the theoretical argument will be developed in chapter 7 and the empirical analysis will be deferred to chapter 8. The last part, part IV, will wrap up this thesis. It first implements an 'empirical reprise' in chapter 9, where it draws together all the empirical analyses in one comprehensive model. Chapter 10 proceeds to summarising all the findings arising from this thesis and then conclude.

⁷²Duch and Stevenson (2008) (as in n. 71), p. 140.

⁷³Duch and Stevenson (2008) (as in n. 71), pp. 140-141.

1.5 Methods of Inference

This thesis advances the argument that context is an important mediating influence on the magnitude of deficit accumulation before elections. The argument will combine the use of formal models with thorough empirical tests.⁷⁴ Formal modeling is a way of developing and presenting theories. In 1959, the philosopher of science Karl Popper maintained that “[t]heories are nets cast to catch what we call the world.”⁷⁵ Theories are nets in the sense that they separate key determinants of a relationship from other influences: they form an abstract model of an observed phenomenon. Theoretical models are said to be parsimonious, which King, Keohane, and Verba define as follows: “Parsimony is a judgement, or even an assumption, about the nature of the world: it is assumed to be simple.”⁷⁶ If the world is simple, theoretical models expose a true relationship by removing all convoluting factors that may obscure it. Since they ignore many factors that one might argue are part of the ‘real world’, theoretical models eschew a degree of realism. However, as Romer argues, realism is not their main purpose: “After all, we already possess a model that is completely realistic - the world itself.”⁷⁷ Yet this model consists of an infinite amount of factors that result in a complexity beyond human comprehension. Theoretical models isolate relationships of interest and foster the understanding of their individual determinants.

Theoretical models need not be formal, i.e. they need not be derived mathematically. A verbally expressed theory can also be a model. However, formal models are arguably more rigorous than verbal models. Fiorina points out three properties that give formal models an analytical advantage: precision, clarity of thought, and logical validity.⁷⁸ Formal models are more precise because each factor that contributes to the theory has to be identified and carefully defined in accordance with the function the factor has in the model. They express thoughts more clearly because they require the determination of expression of all assumptions the model rests upon. In many cases these assumptions can be tested separately, allowing for a rigorous evaluation of the model. Finally, formal models enforce logical arguments due to their mathematical reasoning. For these reasons, this thesis will develop the theoretical

⁷⁴In political science, this approach has recently been popularly labeled as EITM (Empirical Implications of Theoretical Models). For an introduction by its key proponents see Aldrich, John, Alt, James E. and Arthur, Lupia (2008) *The EITM Approach: Origins and Interpretations*, In Box-Steffensmeier, Janet M., Brady, Henry E. and Collier, David, editors *The Oxford Handbook of Political Methodology*, Oxford, New York, NY: Oxford University Press.

⁷⁵Popper, Karl ([1959] 2002) *The Logic of Scientific Discovery*, London and New York, NY: Routledge, pp. 38–39.

⁷⁶King, Gary, Keohane, Robert O. and Verba, Sidney (1994) *Designing Social Inquiry: Scientific Inference in Qualitative Research*, Princeton, NJ: Princeton University Press, p. 20.

⁷⁷Romer (2001) (as in n. 2), p. 14.

⁷⁸Fiorina, Morris P. (1975) Formal Models in Political Science, *American Journal of Political Science*, Vol. 19, No. 1.

argument formally.

Theories can be useful in isolation in order to provide interesting conjectures about relationships of interest. However, their real value rests upon empirical support. Only if a theory can prove its mettle in an empirical test, it teaches something about the ‘real world.’⁷⁹ Empirical tests can be qualitative and quantitative.⁸⁰ Indeed, depending on the research topic quantitative data might not be available and qualitative research is the only way of gaining empirical insights. On the other hand, case studies can provide useful information on relationships at the micro-level.⁸¹ This thesis will adopt a quantitative approach, however, because it allows to statistically isolate the hypothesised relationship from obscuring factors.⁸²

1.6 The Contribution

There is increasing strain on political science to proof itself as a ‘proper’ science with tangible added value to society.⁸³ It is thus important to clearly point out as to how the insights generated in this thesis are valuable. As was argued above, the thesis is topical. Budget deficits have soared since the 2007 credit crunch, bringing public debt to the forefront of public attention. In Germany, for example, a survey conducted by the Forsa polling institute found that the deficit was the primary cause of concern for respondents with a considerable 84% seeing the federal deficit as the biggest current problem.⁸⁴ Citizens’ concerns about rising debt are not unwarranted given the considerable associated costs. This thesis shows that voters’ limited ability to monitor government performance provides an incentive for incumbents to increase the deficit before elections. With the current level of public awareness of deficits, the quality of monitoring may already have improved. However, due to the sensitivity of additional government borrowing in times of high levels of public debt, it is important to acquire a profound understanding of the factors that can give rise to the inefficient debt that is accumulated in conjunction with political budget cycles. By exploring the contextual determinants of political budget cycles, this thesis thus provides valuable insights.

⁷⁹Popper ([1959] 2002) (as in n. 75).

⁸⁰Granato, Jim and Scioli, Frank (2004) Puzzles, Proverbs, and Omega Matrices: The Scientific and Social Significance of Empirical Implications of Theoretical Models (EITM), *Perspectives on Politics*, Vol. 2, No. 2.

⁸¹King, Keohane and Verba (1994) (as in n. 76).

⁸²The two main programmes used in this thesis for the statistical analysis are R, which is particularly suited for the analysis of multilevel models, and Stata, which is strong in the analysis of panel data.

⁸³Cohen, Patricia (2009) Field Study: Just How Relevant is Political Science? *The New York Times*, 20 October.

⁸⁴Der Spiegel (Online) (2009b) Union Fällt auf Schlechtesten Wert Seit 2006, 4 March (URL: <http://www.spiegel.de/politik/deutschland/0,1518,611218,00.html>).

The thesis makes a number of contributions to the academic discourse on strategic debt. Firstly, it bolsters the case for including contextual features into the analysis of political budget cycles. Political budget cycles differ across countries and time and it is important to understand the cause of this variation. In particular, the thesis shows that strategic debt is not just a phenomenon observed in developing countries but also in the developed world. The analyses in the subsequent analyses are substantially based on data from developed democracies.⁸⁵ Partly this is due to data limitations. But this focus is sensible to make the claim that political budget cycles are a phenomenon in developed democracies.⁸⁶ If political budget cycles are less visible in the developed world, the analysis will have to be considerably refined to disentangle the subtle nuances of strategic borrowing.

Another important contribution to the academic discourse concerns theoretical models of political budget cycles. These models have grown significantly in number over the past three decades but are largely isolated from each other. The thesis discusses these models, evaluates their respective merit, tests core assumptions, and synthesises some of their core features. Combining these models uncovers an important interaction between different incentives. Government popularity and polarisation can have independent effects on the incentives for public debt. This thesis demonstrates, however, that the effects are interlinked. The thesis is thus an argument for a synthesis of existing research for more wholistic theories. In this vein, the thesis makes another contribution to the academic discourse. It integrates a wider literature on economic voting into the theory of political budget cycles. To this point, these two traditions are only loosely linked. By building on studies that examine the effect of competence signals on the economic vote, and extending the argument to governments' incentives to borrow, this thesis fosters closer links between these two traditions.

Lastly, the substantive results the thesis generates are interesting in their own right. Government popularity and party polarisation have a joint effect on political budget cycles, where popularity has a parabolic effect on the deficit when polarisation is low and an increasingly linear effect when polarisation increases. Sovereign risk has a dampening effect on the use of strategic debt. Economic disturbances and coalition government both decrease the magnitude of the political budget cycle. These results are derived from carefully developed formal models and empirical tests. The data used for the quantitative analysis are partly drawn from existing work but many key variables were constructed based on novel data. The cross-sectional dimension of this study is comparatively extensive and will thus

⁸⁵The exception to this is chapter 8 which includes a significant number of low-income countries.

⁸⁶See in particular Shi and Svensson (2006) *Journal of Public Economics* (as in n. 63).

enhance the external validity of the inferences about the impact of electoral competition on the dynamics of public debt.

1.7 Conclusion

This thesis examines how context influences the impact of electoral competition on the dynamics of public debt. It is important to understand these dynamics because public debt has considerable welfare implications. The dynamics of public debt can be analysed both across time and space. By looking at the impact of elections on the deficit, this thesis emphasises the temporal element and thus feeds into a larger literature on context-conditional political budget cycles. The approach is based on a dual strategy of formal modeling and empirical tests.

Part I of the thesis focuses on model selection. It discusses existing models in the literature and chooses one model as the basic model to be extended in subsequent chapters. Part I will also test the assumption of the chosen model to establish its suitability for explanatory inference. Part II will deal with governments' motives for pre-election debt, focusing on government popularity, polarisation, and sovereign risk. Part III will turn to the effectiveness of debt as a strategic instrument, by focusing on economic volatility and coalition government. The last part, part IV, of this thesis will summarise the insights derived from the analysis, and conclude.

Part I

Model Selection

Chapter 2

Models of Strategic Debt

2.1 Introduction

Since the late 1980s, numerous models have been presented that aim to explain why governments may increase deficits before elections. Although each of these models provides interesting conjectures, they cannot all have an equal degree of explanatory power. This thesis examines how context conditions the magnitude of political budget cycles. To this end, it will use a model that explains pre-election deficits and examine how different contextual features may alter the mechanisms that result in strategic debt. Three criteria will be decisive for this task: 1) The model has to be sufficiently general to be able to accommodate a variety of different contexts. 2) The model must have predictive power. If a theoretical model makes predictions that are empirically falsified, it is likely to be incorrectly specified and therefore of limited use; or to express it with Lieberman's words: "A theory that ignores existing evidence is an oxymoron."¹ 3) The thesis aims at *explaining* why political budget cycles arise under different conditions. It is therefore not sufficient to accept a model merely on the basis of reasonable predictions. Rather, the underlying assumptions have to be empirically corroborated. Therefore, the third criterion is that the model be realistic. This chapter surveys the models of political budget cycles in the literature and assesses them based on these three criteria, with the aim to select one that will serve as the basic model for this thesis. The chapters in parts II and III of this thesis will then extend this basic model to examine how context affects strategic debt.

All of the models surveyed in this chapter explicitly or implicitly share the same assumption: borrowing is costly. This means that a benevolent social planner would avoid debt by internalising all costs to society as a whole. Democratically elected politicians differ from the social planner in that they care mostly about their own gain, not overall societal welfare. Nobel laureate James Buchanan thus argues that "[i]ndividuals must be modeled as seeking to further their own narrow self-interest, narrowly defined, in terms of measured net wealth position as predicted or expected."² The individuals ultimately responsible for fiscal policy are governments. Once they are entrusted with governing power in an election, they have a considerable degree of autonomy over policy until the next election when their political fate is decided anew. Positivist theories of strategic debt thus focus on governments and strive to model their cost-benefit calculus which may give rise to pre-election deficits.

¹Lieberman, Stanley (1992) Einstein, Renoir, and Greeley: Some Thoughts About Evidence in Sociology, *American Sociological Review*, Vol. 57, No. 1, p.4. See also Friedman, Milton (1953) *Essays in Positive Economics*, Chicago, IL: University of Chicago Press, Chap. 1.

²Buchanan, James M. (1989a) *Essays on the Political Economy*, Honolulu, HI: University of Hawaii Press.

This chapter reviews the literature to discuss the main models of strategic debt. It should be noted that this literature has its roots in political business cycle theory, as first conceived by Nordhaus.³ However, as the previous chapter has explained, this theory mainly relates to monetary policy, not to deficits, and is thus of limited relevance to this thesis. Moreover, the theory has largely been discredited with the onset of the rational expectations revolution due to the emphasis on myopic voters, as also explained in chapter 1. This chapter will thus limit itself to models of political budget cycles, as first conceived during the late 1980s.

The models of strategic debt to be surveyed in this chapter are summarised in table 2.1. The models are divided into three categories, each of which highlights a particular element of electoral competition resulting in strategic debt. The second column presents the key mechanism that translates the incentive of re-election into a political budget cycle in each of the models, and the third column acknowledges their intellectual ownership. The chapter will proceed as follows. The next section will address the first class of models which are based on the *incumbent's competence* (in column one of table 2.1). The section will discuss different elements of the principal-agent relationship that exists between voters and politicians. This category can thus be subdivided into models highlighting the problems of adverse selection and moral hazard respectively. Section two will address each of these models and explain in more detail the mechanism for strategic debt in either model. Section three then turns to *policy reputation* and section four illuminates the last category in table 2.1, *future constraints*. The sections will assess the individual merit of each model based on the three criteria of generality, predictive power, and realism, and evaluate their suitability as a basic model for this thesis. The last section will summarise the insights from this discussion and conclude.

2.2 Incumbent's Competence

The first class of models under the header *incumbent's competence* in table 2.1 focuses on governments' innate ability to conduct policy competently. Rogoff and Sibert provided the seminal contribution on competence-based models of political budget cycles. They define competence as follows: "the more competent that a government is, the less revenue it needs to provide a given level of government services."⁴ Their interpretation of competence is thus one of productivity where more productive governments are more competent. Productivity can

³Nordhaus, William D. (1975) The Political Business Cycle, *The Review of Economic Studies*, Vol. 42, No. 2.

⁴Rogoff, Kenneth and Sibert, Anne (1988) Elections and Macroeconomic Policy Cycles, *The Review of Economic Studies*, Vol. 55, No. 1, p. 2.

Table 2.1: Models of strategic debt

Emphasis	Mechanism	Reference
Incumbent's competence	Exploit asymmetric information	Rogoff & Sibert (1988) Rogoff (1990) Shi & Svensson (2006) Alt & Lassen (2006a)
Policy reputation	Exploit fiscal reputation	Aghion & Bolton (1990)
	Exploit monetary reputation	Milesi-Ferretti (1995)
	Augment relevance of reputation	Milesi-Ferretti & Spolore (1993)
Future constraints	Constrain opponent's level of spending	Persson & Svensson (1989)
	Influence opponent's spending composition	Tabellini & Alesina (1990)

have different sources and political candidates may have a comparative advantage over their competitors in different policy areas. Persson and Tabellini suggest that “one candidate may be particularly able to deal with trade unions and another to deal with an oil price shock, and a third has a better ability to organize his administration.”⁵ One could thus characterise competence as ‘soft skills’ that politicians possess and that allow them to provide public goods at no additional cost. These skills then determine a government’s competence level, which in turn will be reflected in its performance in office. Musgrave points out that “[a]ctual performance will differ among governments and periods of time, but efficient conduct and constructive leadership are not beyond reach.”⁶ Indeed, in a democracy, voters have a choice between competing candidates and will want to choose the most competent candidate for office. This gives incumbents an incentive to appear competent in order to secure re-election.

Models in this category differ with respect to whether governments *signal* their actual competence type or *feign* competence that they actually do not necessarily possess. The different conclusions follow from the specific set-up of the model structure, and depend on the principal-agent problem they address. Laying the groundwork of principal-agent theory, Ross explains: “[a]n agency relationship has arisen between two (or more) parties when one, designated as the agent, acts for, on behalf of, or as a representative of the other, designated the principal, in a particular domain of decision problems.”⁷ Voters are thus the principals,

⁵Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press, p. 420.

⁶Musgrave, Richard. A.; Buchanan, James M. and Musgrave, Richard. A., editors (1999) *The Nature of the Fiscal State: The Roots of My Thinking*, Cambridge, MA: MIT Press, p. 34.

⁷Ross, Stephen A. (1973) The Economic Theory of Agency: The Principal's Problem, *The American Economic Review*, Vol. 63, No. 2, p. 134.

delegating power to governments, their agents, in order to make policies on their behalf. A principal-agent problem arises when agents have private information, i.e. information that is not revealed to the principals, and when preferences are non-congruent between agents and principals. Principal-agent problems generally fall into two categories: adverse selection and moral hazard. Whether a government signals or feigns competence depends on which of these problems the model incorporates.

2.2.1 Adverse Selection

An adverse selection problem arises when there is a pool of agency candidates who differ in their quality. Principals would like to choose the candidate with the highest quality level, yet quality is unobserved and thus private information to the candidates. Candidates with a high quality level therefore have an incentive to *signal* their quality level in order to distinguish themselves from their competitors who are of a lower quality. The seminal work on political budget cycles was developed by Rogoff and Sibert.⁸ In their model strategic debt is the consequence of an adverse selection problem. The quality political candidates differ in is competence, which is unobserved by voters, and thus private information. A second source of asymmetric information is the fiscal budget. Voters observe taxation but there is a hidden form of revenue, which in the model can be government borrowing or seignorage (i.e. printing money). Accordingly, Rogoff and Sibert label this hidden budget item a ‘seignorage tax’. Equation 2.1 illustrates the model set-up:⁹

$$g_t = \tau_t + d_t + R(d_{t-1}) + \eta_t^j \quad (2.1)$$

g_t represents government expenditure, τ_t is the observed tax and d_t is the deficit or seignorage, which comes at a cost $R(d_{t-1})$. Candidate j ’s competence is captured by the term η_t . It is modeled as a first-order moving average (MA1) processes, as shown in equation 2.2, where the μ ’s represent individual competence shocks in periods t and $t-1$ respectively:

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j \quad (2.2)$$

Since competence is serially dependent, voters have an incentive to select a government that is competent in period t because competence will partly be carried on into the next (post-election) period, $t+1$. Voters observe the seignorage tax with a one-period time lag.

⁸Rogoff and Sibert (1988) (as in n. 4).

⁹Note that the notation departs from the one used in the original Rogoff and Sibert model to maintain a consistent notation throughout this thesis.

For this reason they can infer the government's competence in the previous period $t - 1$ but not in period t , resulting in the adverse selection problem in period t , the election year. The government sets taxes shortly before the election and any shortfall in revenue will have to be made up with an increase in the deficit. Since voters cannot observe the most recent competence shock, governments have an incentive to 'cheat' by setting taxes too low (or alternatively increasing expenditure by too much), thus suggesting that the competence shock was of a large magnitude. However, financing the resulting short-fall in revenue comes at a cost to the government. Rogoff and Sibert model cost as an increasing function, such that $R'(d) > 0$ and $R''(d) > 0$.¹⁰ This means that a higher seignorage tax comes at an increasing cost, making it less and less worthwhile for candidates with lower competence to pose as a competent type. For this reason, separating equilibria can exist where competent candidates signal competence and less competent ones do not. Governments can thus signal their competence to voters through this seignorage tax before elections.

One of the main merits of this model is that it is very general and could accommodate a variety of different contexts that condition a government's ability to signal competence. The assumptions the model makes also seem realistic. Two major assumptions stand out: government competence is a determinant of the vote choice; and the seignorage tax is not perfectly observed. Both assumptions find support in the literature.

With regards to government competence, there is a vast literature on the extent to which economic performance affects the vote choice.¹¹ Early studies of economic voting were in particular based on the theoretical work of Barro and Ferejohn.¹² They modeled politicians as rent-seekers whereby elections served as a punishment mechanism for excessive rent-seeking. One key criticism of this model type was that voters were essentially *backward-looking*, punishing governments for extracting rents. Yet, are voters only concerned with sanctioning past performance? A more intuitive assumption seemed to be that of forward-looking voters who use elections a selection mechanism for the best candidate for office.¹³ The Rogoff and Sibert model incorporates this emphasis on selection in which voters support the candidate with the highest competence.

This emphasis seems justified. In 1963, Stokes reconsidered the then dominant Downsian

¹⁰C/f the discussion in chapter 5 for a justification of this specification of the cost function.

¹¹For a broader discussion of economic voting, see also chapter 6 of this thesis.

¹²Barro, Robert J. (1973) The Control of Politicians: An Economic Model, *Public Choice*, Vol. 14, No. 1; Ferejohn, John (1986) Incumbent Performance and Electoral Control, *Public Choice*, Vol. 50, No. 1.

¹³For a discussion of the merits of the selection model over the sanctioning model see in particular Fearon, James D. (1999) Electoral Accountability and the Control of Politicians: Selecting Good Types Versus Sanctioning Poor Performance, In Przeworski, Adam and Stokes, Susan C., editors *Democracy, Accountability, and Representation*, Cambridge: Cambridge University Press.

spatial model of electoral competition.¹⁴ One of his criticisms was that the contest for office may not just be about policies but rather their successful and effective implementation. In this case, parties would be elected not simply when they are located at the policy position with the highest voter density but also when voters believed they were most capable to implement certain desired policies. Stokes referred to this aspect of voting as *valence*. The emphasis on valence has been an important addition to voting models.¹⁵ Incumbent competence is a key constituent part of the concept of valence since it conditions a government's ability to effectively achieve desired policy goals. The emphasis on competence in the Rogoff and Sibert model can therefore be considered realistic.

The second assumption, which posits that voters cannot perfectly observe the seignorage tax, also derives some support from the literature, in particular with respect to deficits. Rogoff and Sibert justify as to why a voter might not be perfectly informed about the deficit by arguing that "it is not worth it for him as an individual to monitor the government closely enough to have complete contemporaneous information on how effectively the government is spending his tax dollars."¹⁶ This reasoning can be supported through a number of other studies. For example, based on the 1988 American National Election Study, Gilens shows that voters in the United States only had limited knowledge about changes in the deficit in that year.¹⁷

Partly, such a lack of knowledge may be determined by education where the rationality assumption only holds weakly and some of the less educated can be fooled because they do not fully understand fiscal policy.¹⁸ This lack of information may be caused or at least aggravated by insufficient fiscal transparency. Buchanan and Wagner were among the first to propose that voters might not fully understand the cost of public debt because they were subject to a 'fiscal illusion'.¹⁹ Although the idea of a fiscal *illusion* loses its appeal when voters are assumed to be rational,²⁰ voters may still face significant obstacles in obtaining reliable information on the budget deficit. For example, governments can resort to creative accounting techniques which allow them to make deficits appear as smaller than they in fact

¹⁴Stokes, Donald E. (1963) Spatial Models of Party Competition, *The American Political Science Review*, Vol. 57, No. 2

¹⁵For a forceful argument for valence-related models to predict party choice, see in particular Clarke, Harold D. et al. (2004) *Political Choice in Britain*, Oxford: Oxford University Press.

¹⁶Rogoff and Sibert (1988) (as in n. 4), p. 6.

¹⁷Gilens, Martin (2005) Political Ignorance and Collective Policy Preferences, *The American Political Science Review*, Vol. 95, No. 2. See also Delli Carpini, Michael X. and Keeter, Scott (1996) *What Americans Know about Politics and Why it Matters*, New Haven, CT: Yale University Press.

¹⁸Krause, George A. and Granato, Jim (1998) Fooling Some of the Public Some of the Time? A Test for Weak Rationality with Heterogeneous Information Levels, *Public Opinion Quarterly*, Vol. 62, No. 2.

¹⁹Buchanan, James M. and Wagner, Richard E. (1977) *Democracy in Deficit: The Political Legacy of Lord Keynes*, New York, NY: Academic Press.

²⁰Cf/ the discussion in chapter 1.3.

are.²¹ Alt and Lassen construct an index of fiscal transparency in OECD countries.²² They show that, although there is considerable variation across countries, there is no perfect fiscal transparency. For this reason, the assumption of a hidden seigniorage tax seems justified.

The major drawback of the model results from its predictive power. Persson and Tabellini argue that it is difficult to test the model because it allows for multiple equilibria, depending on the government's competence (in the model governments with *medium* competence cheat the most).²³ Competence is difficult to measure and even though the Rogoff and Sibert model is an important theoretical contribution, its application in empirical studies is very limited.²⁴ For this reason, the model, in spite of its many virtues, will not serve as the basic model in this thesis. Its cousin, the moral hazard model of political budget cycles, constitutes a more attractive alternative.

2.2.2 Moral Hazard

A moral hazard problem arises when principals cannot perfectly monitor their agent's performance. Agents can then pursue their interests irrespective of those of the principals. Models of political budget cycles based on moral hazard build on Holström's model of managerial career-concerns.²⁵ The structure of these models is very similar to those emphasising adverse selection but they make one key distinction: politicians do *not* observe their own competence before the election.²⁶ This means that although political candidates still differ in competence, they cannot *signal* their competence since they only learn their own competence after the election. However, because voters still cannot observe the deficit, politicians still have an incentive to *feign* competence,²⁷ independent of their actual level of competence. Voters understand this incentive and therefore expect an increase in the

²¹For a theoretical and empirical treatment of creative accounting see both Milesi-Ferretti, Gian Maria (2004) Good, Bad or Ugly? On the Effects of Fiscal Rules with Creative Accounting, *Journal of Public Economics*, Vol. 88, No. 1-2; Hagen, Jürgen von and Wolff, Guntram B. (2006) What Do Deficits Tell Us About Debt? Empirical Evidence on Creative Accounting with Fiscal Rules in the EU, *Journal of Banking & Finance*, Vol. 30, No. 12. The experience of Greece's manipulation of national accounts to disguise government borrowing which made the world economy wobble in early February 2010 provides an excellent recent illustration of creative accounting, see, e.g. The Economist (2010b) Rebuilding Greece's Finances, 6 February.

²²Alt, James E. and Lassen, David Dreyer (2006a) Fiscal Transparency, Political Parties, and Debt in OECD Countries, *European Economic Review*, Vol. 50, No. 6.

²³Persson and Tabellini (2000) (as in n. 5), p. 425.

²⁴One possible application is discussed by Angeles Gonzalez, Maria de los (2002) Do Changes in Democracy Affect the Political Budget Cycle? Evidence from Mexico, *Review of Development Economics*, Vol. 6, No. 2.

²⁵Holmström, Bengt (1999) Managerial Incentive Problems: A Dynamic Perspective, *Review of Economic Studies*, Vol. 66, No. 1, earlier version 1982.

²⁶Since the structure of the two model types is very similar it should be noted that strictly speaking, the moral hazard model of political budget cycles is still a selection model: voters aim to select a competent government, even though competence is unobserved before the election. It is thus a different typology of moral hazard and adverse selection models than discussed in much of the literature in political science, as, e.g. in Fearon (1999) (as in n. 13).

²⁷Note that the conceptual difference between 'feigning' and 'signaling' is that the former implies pretending something that may not be the case whereas the latter is based on actual information.

deficit before elections. Similar to a self-fulfilling prophecy, governments will comply with the voters' expectations and increase the deficit before elections.

As opposed to the model under adverse selection, all politicians share the same incentive to borrow strategically before an election in the moral hazard model. This conclusion seems more intuitive than Rogoff and Sibert's proposition that only incumbents with an intermediate level of competence will borrow. In fact, one result of this type of model seems rather perverse. In a related model, Rogoff shows how strategic borrowing can have positive welfare implications because the benefits from selecting a competent government outweigh the cost of signaling.²⁸ This conclusion seems counter-intuitive and it is at odds with the empirical literature. According to this type of model, voters would reward governments for tax cuts or fiscal expansions since they were signs of competence. However, the literature shows that, if anything, voters are indifferent or even punish governments for such policies in election years.²⁹ The moral hazard model, on the other hand, receives empirical support. Golden and Poterba argue that the effect of pre-electoral spending on the vote choice is negligible, which is in line with the moral hazard model that posits that such spending is fully expected.³⁰ Suzuki examines voters' expectations more closely and provides empirical evidence that voters indeed expect pre-electoral fiscal expansions.³¹ In fact, even credit rating agencies share this expectation. Block *et al.* show that sovereign risk ratings are likely to go up shortly before elections because of the expectation of an increase in the deficit.³² For these reasons, the moral hazard model has more predictive power than the adverse selection model.

A similar story holds for the realism of the models' assumptions. The key difference between the two types of models is that the moral hazard model assumes contemporaneous competence as hidden information for political candidates. Shi and Svensson justify this assumption by arguing that "politicians are (ex ante) uncertain about how they will be able to handle future problems, and thus how well they will be able to transform government

²⁸Rogoff, Kenneth (1990) Equilibrium Political Budget Cycles, *The American Economic Review*, Vol. 80, No. 1.

²⁹Brender, Adi and Drazen, Allan (2008) How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries, *The American Economic Review*, Vol. 98, No. 5; Peltzman, Sam (1992) Voters as Fiscal Conservatives, *The Quarterly Journal of Economics*, Vol. 107, No. 2. See also chapter 3 of this thesis.

³⁰Golden, David G. and Poterba, James M. (1980) The Price of Popularity: The Political Business Cycle Reexamined, *American Journal of Political Science*, Vol. 24, No. 4.

³¹Suzuki, Motoshi (1992) Political Business Cycles in the Public Mind, *The American Political Science Review*, Vol. 86, No. 4.

³²Block, Steven A. and Vaaler, Paul M. (2004) The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries, *Journal of International Money and Finance*, Vol. 23, No. 6; Block, Steven A., Vaaler, Paul M. and Schrage, Burkhard (forthcoming) Elections, Opportunism, Partisanship, and Sovereign Ratings in Developing Countries, *Review of Development Economics*.

revenues into public output.”³³ Put slightly differently, and going back to the interpretation of competence as political ‘soft skills’, it is uncertain before the election what skills will be required during the next electoral term and whether the government possesses them. This assumption, seems more realistic than Rogoff and Sibert’s larger degree of providence on the part of politicians.

The moral hazard model shares the generality of the adverse selection model but makes more plausible predictions and has more realistic assumptions. Since all governments share the same incentive to feign competence, irrespective of competence, it also makes more clear-cut predictions.³⁴ For these reasons it is not surprising that the empirical literature on political budget cycles is largely based on theories related to the moral hazard model.³⁵ In this light, the model is also a strong contender as a basic model for this thesis. However, before a final decision can be made, other potential alternatives, as summarised in table 2.1, should be considered and discussed.

2.3 Policy Reputation

Models emphasising *policy reputation* demonstrate that governments may use debt in order to make their political platforms more attractive to the electorate, relative to their competitors. If voters believe that the incumbent provides better answers to salient issues, her probability of retaining office increases. As opposed to competence models, models based on reputation differ in the mechanism through which political candidates try to gain an advantage over their competitors. That mechanism depends on the comparative advantage a candidate has on particular policy issues, namely with respect to fiscal policy, monetary policy, or non-economic policies.

The first model in this category was presented by Aghion and Bolton.³⁶ In their model left-wing parties have a reputation for bad fiscal management. The model assumes that voters believe that a left-wing government does not have the capability of managing high levels of public debt whereas right-wing parties have a reputation for sound fiscal management. If a left-wing party has a high risk of default on debt payments, right-wing governments have

³³Shi, Min and Svensson, Jakob (2003) Political Budget Cycles: A Review of Recent Developments, *Nordic Journal of Political Economy*, Vol. 29, No. 1, p. 70.

³⁴See also Persson and Tabellini (2000) (as in n. 5), p. 425.

³⁵See, e.g., Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9; Alt and Lassen (2006a) *European Economic Review* (as in n. 22); Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3.

³⁶Aghion, Patrick and Bolton, Philippe (1990) Government Domestic Debt and the Risk of Default: A Political-Economic Model of the Strategic Role of Debt, In Dornbusch, Rudiger and Draghi, Mario, editors *Capital Markets and Debt Management*, Cambridge, MA: MIT Press.

a comparative advantage when debt-levels are high. In order to exploit this fiscal reputation and thus enhance their electoral prospects, right-wing governments may accumulate large debt-levels before an election.

Milesi-Feretti develops a very similar model, but instead of focusing on a party's reputation for fiscal policy, he directs attention to monetary policy.³⁷ In this model competing parties differ in their degree of inflation aversion. Increasing the nominal debt stock before an election raises the risk of rising inflation. As inflation becomes a salient issue in the election, voters are more likely to support the inflation-averse party because it is expected to be more effective at fighting inflation. The model essentially borrows an idea first presented by Rogoff who argued that the appointment of an inflation-averse Central Banker would decrease the inflationary bias of an economy which is characterized by a short-run trade-off between inflation and unemployment.³⁸ Similarly, in Milesi-Ferretti's model, voting for an inflation-averse government in a period of high inflationary risk would be welfare improving for voters. In this model, an inflation-averse government has an incentive to create a problem, namely a dangerous high level of public debt, because it has the best answers to solve it.

Lastly, policy advantages can also spill over into non-economic policy domains. Milesi-Ferretti and Spolaore present a model in which political platforms are two-dimensional.³⁹ Of those dimensions one is economic and the other non-economic (e.g. foreign policy). If the median voter is closer to the political opponent on economic decisions but closer to the incumbent on non-economic issues, the government may increase the deficit in order to introduce fiscal constraints with a high deficit, thus decreasing the importance of economic issues in the election. The incumbent in this model enhances the competitiveness of its policy platform and thus its electoral prospects by increasing the relative salience of the non-economic policy dimension.

Although all three models provide interesting insights into electoral strategies governments might wish to pursue, they do not convincingly meet the three criteria of generality, predictive power, and realistic assumptions, as employed for model selection in this thesis. For one, these models were often conceived to explain one particular occurrence, such as the mushrooming deficits during the Reagan administration in the United States.⁴⁰ They

³⁷Milesi-Ferretti, Gian Maria (1995) Do Good Or Do Well? Public Debt Management in a Two-Party Economy, *Economics and Politics*, Vol. 7, No. 1.

³⁸Rogoff, Kenneth (1985) The Optimal Degree of Commitment to an Intermediate Monetary Target, *Quarterly Journal of Economics*, Vol. 100, No. 4.

³⁹Milesi-Ferretti, Gian Maria and Spolaore, Enrico (1994) How Cynical Can an Incumbent Be? Strategic Policy in a Model of Government Spending, *Journal of Public Economics*, Vol. 55.

⁴⁰This holds particularly for Milesi-Ferretti and Spolaore (1994) (as in n. 39) and Milesi-Ferretti (1995) *Economics and Politics* (as in n. 37).

were thus not designed to be general in the first place. Moreover, these models have mainly been motivated by or illustrated with anecdotal evidence; they have not been subjected to thorough empirical tests which leaves doubts as to how strong their predictive power is. Lastly, these models generally assume that debt is observed and, in fact, a rather important element of the vote choice. This assumption is thus directly opposed to competence models which assume that public debt can serve as a strategic instrument because it is relatively unobserved. As was argued in the previous section it seems reasonable to assume that deficits are not perfectly observed. Even though public debt may be a salient issue in an election in exceptional circumstances, it seems more reasonable to assume that debt is not a main determinant of the calculus of voting. For these reasons, this thesis will favour the competence approach to models based on policy reputation.

2.4 Future Constraints

Models focusing on competence signals as well as models on policy reputation concentrate on governments that strive for re-election. A third class of models, summarised under the header *future constraints* in table 2.1, focuses on governments whose electoral prospects are so grim that they expect to lose the next election. In this case, governments may not be as concerned with their re-election as with constraining their likely successor in conducting policies in the future that they dislike; in other words, they are policy-seekers.⁴¹ At the core of models in this category is thus the issue of time-inconsistent preferences between the incumbent and its challenger. Two models fall into this third category in table 2.1 and the differences between them are very nuanced.

In a model presented by Persson and Svensson unpopular governments will try to influence future expenditure.⁴² A right-wing government that anticipates to be replaced by a left-wing government may wish to constrain future spending by cutting taxes and increasing the deficit. Since taxes will be sub-optimally low in the pre-election period and sub-optimally high some time after the election when the debt will have to be amortised, this strategy induces inter-temporal tax distortions. If however the government places a higher value on constraints on spending than on tax distortions, a right-wing government may increase the deficit before losing an election. Interestingly, the results of the model are

⁴¹On parties as office- or policy-seekers, see in particular Müller, Wolfgang C. and Strøm, Kaare (1999) *Policy, Office, or Votes? How Political Parties in Western Europe Make Hard Decisions*, Cambridge: Cambridge University Press.

⁴²Persson, Torsten and Svensson, Lars E.O. (1989) Why Would a Stubborn Conservative Run a Deficit: Policy with Time-Inconsistent Preferences, *Quarterly Journal of Economics*, Vol. 104.

reversed for left-wing governments.

The last model in table 2.1 and in this category is a model presented by Tabellini and Alesina.⁴³ The model closely resembles the Persson-Svensson model. In Tabellini and Alesina's model, however, future constraints are not imposed on the *level* of government spending but rather on the *composition* thereof. In this model, the government that is likely to replace the incumbent may have different preferences over policies. If the incumbent faces electoral defeat, it may increase spending on policies it values, leaving the burden of financing these policies to the future government. Tabellini and Alesina thus conclude from their model that "[d]isagreement amongst alternating policymakers and uncertainty about who will be appointed in the future prevent the current government from fully internalizing the cost of leaving debt to its successors."⁴⁴ Public debt is thus, again, a strategic instrument to constrain the future incumbent.

These models have only been tested to a limited extent. Indeed, there is evidence from OECD countries that right-wing governments borrow more during election years than left-wing governments, as demonstrated by Alt and Lassen.⁴⁵ This finding is commensurate with the predictions from the Persson and Svensson model. However, it is theoretically based on a competence-based model, as explained above, even though it incorporates the spending preferences of the Persson and Svensson model. The most direct test of the two models was conducted by Pettersson-Lidbom who contrasts the the two models in the setting of Swedish municipal elections.⁴⁶ His results provide strong support for the Persson and Svensson model over the Alesina and Tabellini model. Thus, models of future constraints with respect to levels of government spending do have predictive power, at least in this empirical setting. This model class also receives support from an experimental study. Tabellini and Alesina show that higher polarisation exacerbates deficits when government popularity is low which conforms with Sutter's experimental findings.⁴⁷ The model has one significant drawback though: its focus on governments anticipating defeat is rather narrow. Generally, governments can be expected to strive for re-election and the model is thus not sufficiently general to serve as a basic model for this thesis. However, the insights are interesting and, as both Alt and Lassen's work⁴⁸ and chapter 4 show, can complement the study of political

⁴³Tabellini, Guido E. and Alesina, Alberto (1990) Voting on the Budget Deficit, *The American Economic Review*, Vol. 80, No. 1; for a similar model see also Alesina, Alberto and Tabellini, Guido E. (1990) A Positive Theory of Fiscal Deficits and Government Debt, *The Review of Economic Studies*, Vol. 57, No. 3.

⁴⁴Alesina and Tabellini (1990) (as in n. 43), p. 404.

⁴⁵Alt and Lassen (2006a) *European Economic Review* (as in n. 22).

⁴⁶Pettersson-Lidbom, Per (2001) An Empirical Investigation of the Strategic Use of Debt, *The Journal of Political Economy*, Vol. 109, No. 3.

⁴⁷Sutter, Matthias (2003) The Political Economy of Fiscal Policy: An Experimental Study on the Strategic Use of Deficits, *Public Choice*, Vol. 116, No. 3.

⁴⁸Alt and Lassen (2006a) *European Economic Review* (as in n. 22).

budget cycles in a competence framework.

2.5 Conclusion

This chapter set out to discuss several models of political budget cycle in order to select one type of model to serve as the basis of the theoretical analysis in this thesis. Table 2.1 summarises these models. The discussion has shown that models based on *incumbent's competence* are particularly suited as a base model to explore context-conditional budget cycles. The chapter has discussed two different variants of this model class: models based on adverse selection and moral hazard. Based on three criteria of generality, predictive power, and realistic assumptions, it was shown that the moral hazard model provides a stronger analytical basis and is thus preferable to the model highlighting adverse selection.

Other models that were discussed were models based on *policy reputation* and *future constraints*. These models, it was argued, provide interesting insights into electoral strategies but are not competitive with the competence models based on the three criteria of model choice employed in this thesis. Elements of the Tabellini and Alesina model emphasising constraints on the challenger's spending composition will be incorporated in chapter 4. However, the main model chosen for the theoretical analysis in this thesis is the moral hazard competence model of political budget cycles.

Chapter 3

Voter Reactions to Electioneering

3.1 Introduction

This thesis derives its theoretical argument from the moral hazard model of political budget cycles. The previous chapter has singled out this model from the literature as the most suitable contender for the theoretical analysis in the following chapters. Yet even the best model will have shortcomings, since all models are abstractions of reality and thus rely on simplifying assumptions. Assumptions need not be correct for models to provide interesting conjectures. If the goal of scientific research is causal inference, or explanation, however, King, Keohane, and Verba argue that “we cannot take untested or unjustified theoretical assumptions and use them in constructing empirical research designs.”¹ For the model to have explanatory power it is thus important to test the empirical validity of central assumptions. This chapter will accept this advice and test the key assumption of the moral hazard model of political budget cycles.

The defining assumption of this model is that a moral hazard situation is the immediate cause of political budget cycles. Since voters cannot perfectly hold the government accountable, incumbents have an incentive to cheat before elections and feign their competence through strategic fiscal policies. Voters are rational and understand this incentive. Therefore, political budget cycles are fully expected. This mechanism is unique to this model type and distinguishes it from all other types discussed in chapter 2. If the assumption can be corroborated it will thus speak to the strength of the model as the basis for causal inference both in its own right and *vis-à-vis* other models.

At first inspection, the assumption seems reasonable. The moral hazard model has strong parallels with a phenomenon that is arguably universal to democratic systems: election gifts. It is important to distinguish election gifts from election promises which appear to be just equally universal to democracies. Promises can provide clues about candidates’ ideological positions and future aspirations, thus constituting valuable information to voters. However, promises cannot be enforced and therefore lack credibility.² Whilst all candidates can make promises, only governments can make election gifts, since they have ultimate authority over policy. If election gifts result from an increase in the government’s productivity, allowing it to provide more goods at a given level of revenue, such gifts provide tangible information on its quality as a public administrator, in other words, its competence. To use a popular dichotomy in politics, election gifts therefore are ‘actions’ whilst promises are only ‘talk’.

¹King, Gary, Keohane, Robert O. and Verba, Sidney (1994) *Designing Social Inquiry: Scientific Inference in Qualitative Research*, Princeton, NJ: Princeton University Press, p. 106.

²See, e.g., Barro, Robert J. (1973) The Control of Politicians: An Economic Model, *Public Choice*, Vol. 14, No. 1.

Since actions have more clout in wooing voters, election gifts are an attractive tool for governments to enhance their electoral stakes. Put differently, they are a means to engineer an electoral victory which is why handing out election gifts is often referred to as *electioneering*.

Of course election gifts are only actual gifts if voters do not have to pay for them with their taxes. Thus, if revenue is held constant, election gifts would have to result from higher government productivity. Yet if voters cannot perfectly observe the budget, governments have an incentive to feign a boost to their administrative competence by financing alleged elections gifts with less visible fiscal instruments, such as public debt. Across time and space the public has largely distrusted politicians.³ The Greek slave and writer Aesop, for example, is credited with the phrase: “We hang the petty thieves and appoint the great ones to public office.” Politicians are thus widely perceived as crooks. Accordingly, they are not believed to be particularly honest. The political philosopher Glen Newey thus argues that “[p]olitics should be regarded as less like an exercise in producing truthful statements and more like a poker game. And there is an expectation by a poker player that you try to deceive them as part of the game.”⁴ In this light, it is rational for voters to anticipate deception before an election and electioneering will therefore be fully expected and discounted. This mechanism is well-captured by the moral hazard model of political budget cycles.

Electioneering is linked to election periods; in off-election years governments have no incentive to feign competence and fiscal expansions or tax cuts are likely to be a consequence of actual shocks to government competence. Since such shocks will be unexpected voters will not discount them and include this additional information on government competence in their calculus of voting. This chapter will test the central assumption of the moral hazard model of political budget cycles by examining voter reactions to fiscal policy shocks in election and non-election years. The evidence based on survey data from 18 OECD countries largely bears out the predictions of the model.

The chapter proceeds as follows. Section two embeds the argument in the theoretical literature. Section three will derive testable hypotheses from the theoretical argument about political budget cycles under moral hazard. The fourth section introduces the data that will be used to test these hypotheses. Sections five and six discuss the estimation procedure and present the results. The last section concludes.

³See, e.g. Nye, Joseph S., Zelikow, Pphilip and King, David C. (1997) *Why People Don't Trust Government*, Cambridge, MA: Harvard University Press; Walle, Steven Van de, Van Roosbroek, Steven and Bouckaert, Geert (2008) Trust in the Public Sector: Is There Any Evidence for a Long-Term Decline? *International Review of Administrative Sciences*, Vol. 74, No. 1.

⁴As quoted in Hinsliff, Gaby (2003) Truth is, Politicians Just Can't Help Lying, *The Observer*, (URL: <http://www.guardian.co.uk/politics/2003/may/18/research.highereducation>). See also Newey, Glen (1997) Political Lying: A Defense, *Public Affairs Quarterly*, Vol. 11.

3.2 Related Literature

Voter reactions to electioneering are intrinsically linked to the literature on expectations. Since Downs's seminal contribution to positive political science, political actors were perceived as rational decision-makers. Downs argued that "rational behavior is impossible without at least some way of forecasting future events."⁵ Yet, how do voters forecast? The initial approach was proposed by Kramer who argued that "a reasonable and convenient hypothesis is that expectations about year t are formed on the basis of experience during the preceding year, $t-1$."⁶ Kramer thus suggested that expectations are *adaptive*, extrapolating the future from the past. Adaptive expectations seemed reasonable since, as Key put it, voters "are not likely to be attracted in great number by promises of the novel or unknown."⁷ Rather, they would, as Kramer argued, judge governments on the basis of what they could observe in the past. This argument was thus an attractive theoretical depiction of voter rationality and it accordingly provided the basis for a number of empirical studies on the effect of economic performance on the vote choice. In particular, it provided the basis for Nordhaus's theory on political business cycles. Indeed, Nordhaus assumed that "while households are rational in their preferences, they are ignorant of the macro-economic trade-off [between inflation and unemployment]. Given that they do not know how well or badly policy makers are doing relative to objective possibilities, households rely on past experience in their political decisions."⁸ If voters extrapolated future performance from past performance, governments could boost the economy before an election, thus fooling voters into believing that economic performance was permanently improved.

However, the past may only be a bad guide to make future predictions. Kuklinski and West thus argued that even though citizens will certainly use information about the past to make predictions about the future, "[i]t does not necessarily follow, however, that citizens' assessment of past economic circumstances and their expectations about the future will be identical, or even nearly so."⁹ Based on the adaptive expectations assumption, many empirical studies had used survey questions in which respondents were asked about their retrospective evaluation of the economy. Kuklinski and West break with this tradition by

⁵Downs, Anthony (1957) *An Economic Theory of Democracy*, New York, NY: Harper, p.106.

⁶Kramer, Gerald H. (1971) Short-Term Fluctuations in US Voting Behavior, 1896-1964, *The American Political Science Review*, Vol. 65, No. 1, p.134.

⁷Key, Vladimir O. (1966) *The Responsible Electorate: Rationality in Presidential Voting, 1936-1960*, New York, NY: Vintage Books, p.61.

⁸Nordhaus, William D. (1975) The Political Business Cycle, *The Review of Economic Studies*, Vol. 42, No. 2, p.172.

⁹Kuklinski, James H. and West, Darrell M. (1981) Economic Expectations and Voting Behavior in United States House and Senate Elections, *The American Political Science Review*, Vol. 75, No. 2, p.437.

employing data on individuals' expected future financial position to determine their effect on the vote choice in U.S. elections.

Although it seemed intuitive to use prospective evaluation when examining vote choice, it still lacked a sound analytical basis. The rational expectations revolution in economics brought with it a new perspective on expectations.¹⁰ Chappell and Keech provided a key contribution to understanding how economic policy affects expectations. They argued that voters did not just extrapolate the future from the past, but used all available information to form expectations. In particular, they stress the role of macroeconomic theory as a form of guidance for voters to understand economic policy more fully. They thus argue that “[t]o know how well an administration performs in managing the economy, we need to understand what patterns of outcomes are feasible and to define a standard of desirability over feasible outcomes.”¹¹ Voters would examine how policies contribute to desired long-term goals. Thus, they would punish short-term distortions. This new perspective shattered the theoretical foundations of the political business cycle. If governments boost the economy before an election, voters can observe that unemployment falls below its natural rate. Macroeconomic theory posits that this will result in an increase in inflation. For this reason, sophisticated, rational voters cannot be fooled by governments who manipulate the economy for electoral gain and would punish a government for such short-term distortions rather than reward it.

This argument discredited the concept of adaptive expectations theoretically. However, empirically, the argument was not immediately accepted. Suzuki thus takes to examining voter expectations more directly. He finds an electoral cycle in voters evaluation of their future financial situation, expectations on unemployment, and consumer sentiment.¹² He argues that his findings provide empirical support for the Nordhaus model of political business cycles because voters expect electoral manipulation. This argument is flawed in the sense that political business cycles are built on adaptive expectations which do not account for deviations from past economic policy in election years. In the Nordhaus model, political business cycles are not expected. Yet they are expected in the moral hazard model of political budget cycles. Suzuki's findings thus provide first empirical support for this model.

Apart from Suzuki's study, voters' expectations on electioneering are only scantily researched. The most important recent contributions in this area were conceived in the context of political budget cycles and the degree to which they differ across countries. Brender and

¹⁰C/f the discussion in chapter 1.3.

¹¹Chappell Jr, Henry W. and Keech, William R. (1985) A New View of Political Accountability for Economic Performance, *The American Political Science Review*, Vol. 79, No. 1, p. 12.

¹²Suzuki, Motoshi (1992) Political Business Cycles in the Public Mind, *The American Political Science Review*, Vol. 86, No. 4.

Drazen argue that political budget cycles are mainly a phenomenon of ‘new democracies’.¹³ In ‘old democracies’, they claim, voters are well informed and would thus punish electioneering rather than reward it. They present evidence from a large cross-section of countries to bolster this argument.¹⁴ There are a number of problems with their argument. For one, why would political budget cycles emerge in the first place if voters punished governments for pre-election fiscal expansions? The argument is at odds with the rationality assumption which should apply to governments at least as much as it does to voters. The moral hazard model does provide a rationale for political budget cycles under rational expectations: electioneering is a consequence of the moral hazard problem and political budget cycles are thus fully expected.

The empirical evidence Brender and Drazen present supports their argument that governments are punished for pre-electoral expansions. Their finding weakens the argument about political budget cycles under moral hazard because such expansions should have no effect since they are fully expected. Yet, the finding may be due to the specific empirical specification. The dependent variable in Brender and Drazen’s study is whether the ‘national leader’ was re-elected. In presidential systems the national leader is the president and in parliamentary systems it is the prime minister. This specification has one particular shortcoming. Brender and Drazen argue that their effects are borne-out particularly well in developed countries. However, governments in most OECD countries are characterised by coalitions of governing parties. In these cases, votes do not necessarily translate into the re-election or ousting of the head of government in a straight-forward manner. In the extreme case, the prime minister’s party may gain votes but not be able to join a coalition. In Brender and Drazen’s study this case would be recorded as punishment. To circumvent this problem, this study looks directly at vote intention/ vote choice which is a more direct measure of the evaluation of government performance.

The analysis presented in this chapter has a few additional advantages over Brender and Drazen’s study. Firstly, Brender and Drazen only look at the re-election of national leaders. Yet in the case of coalition government, multiple parties are responsible for policy-making. Focusing on the party of the head of government can be justified because these parties have the largest responsibility for policy and therefore receive the greatest share of blame and

¹³Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

¹⁴Brender, Adi and Drazen, Allan (2008) How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries, *The American Economic Review*, Vol. 98, No. 5. For a similar analysis that focuses exclusively on Israel and Colombia respectively, see Brender, Adi (2003) The Effect of Fiscal Performance on Local Government Election Results in Israel: 1989-1998, *Journal of Public Economics*, Vol. 87, No. 9-10; Drazen, Allan and Eslava, Marcela (2008) Electoral Manipulation via Expenditure Composition: Theory and Evidence, *NBER Working Paper*.

credit for economic management.¹⁵ However, if multiple parties are in government, it seems reasonable to examine the vote choice not just for the ‘main’ party but all parties. The analysis will thus look at electoral support for the government on the whole as well as for the prime minister’s (or president’s) party.

Secondly, the analysis in this chapter is a better test for the moral hazard model because it explicitly compares the effect of fiscal expansions in election years and non-election years. These effects are said to differ if the moral hazard model is correct - non-election years are entirely missing from the Brender and Drazen model. Lastly, using individual-level models seems more appropriate to test the assumption of voter expectations than an aggregate study.¹⁶ This format also allows to control for individual-level characteristics such as voter ideology and subjective individual economic evaluations. The relative disadvantage of the analysis in this chapter is that it only includes 18, developed, countries whilst Brender and Drazen include 74 countries, both from the developed and developing world. The advantages of the format employed in this chapter, however, likely outweigh this disadvantage, in particular since Brender and Drazen argue that their findings are particularly strong for developed countries.

3.3 Theory

In a sense, the moral hazard model of political budget cycles is built on a self-fulfilling prophecy: governments borrow because voters expect them to. If it is built on realistic assumptions, the following empirical patterns should emerge: in non-election years, governments do not have an incentive to appear competent. This is based on the model structure. Governments can feign competence because voters observe the deficit with a time lag. In the next period, voters observe all constituent elements of the budget and can hence infer government competence, except for the most recent competence shock. They can thus always infer the government’s competence shock from period $t - 1$. Therefore, in non-election years governments cannot gain from deficit spending because voters will know their actual level of competence in the next period. Since voters understand this structural pattern, they

¹⁵See, e.g. Anderson, Christopher J. (1995) *Blaming the Government: Citizens and the Economy in Five European Democracies*, Armonk, NY: M.E. Sharpe; Brug, Wouter Van der, Eijk, Cees Van der and Franklin, Mark N. (2007) *The Economy and the Vote: Economic Conditions and Elections in Fifteen Countries*, Cambridge: Cambridge University Press; Duch, Raymond M. and Stevenson, Randolph T. (2008) *The Economic Vote: How Political and Economic Institutions Condition Election Results*, Cambridge: Cambridge University Press.

¹⁶Lewis-Beck forcefully argued for the use of individual level data in the analysis of the vote choice; Lewis-Beck, Michael S. (1990) *Economics and Elections: The Major Western Democracies*, Ann Arbor, MI: University of Michigan Press. See also the discussion in Duch and Stevenson (2008) (as in n. 15), pp. 17–28.

will believe that expenditure shocks in non-election years are indeed driven by government competence. If voters favour competent over incompetent governments, they should become more favourable to the incumbent if positive expenditure shocks are indicative of a higher degree of government competence.

In election years, however, politicians have an incentive to feign competence because voters can only infer the *actual* level of competence *after* the election, when their votes are already cast. This time lag is precisely the cause for the moral hazard situation in which governments have an incentive to exploit weak monitoring to pursue strategic fiscal policies that could potentially enhance their electoral fate. Yet voters understand this incentive and therefore *expect* governments to increase expenditure before elections. As a consequence, expenditure shocks should not affect the vote choice since they are expected. This chapter will thus test the following hypotheses:¹⁷

H3.1: In non-election years, voters reward governments for fiscal expansions.

H3.2: In election years, voters do not respond to fiscal expansions.

These two hypotheses will be tested in the following sections.

3.4 Data

The dependent variable in this analysis is vote intention or the vote choice. If voters reward a government for competence shocks, this should be reflected in the way they vote. The literature on strategic voting posits that voters do not necessarily vote for the party that is closest to their ideological position. However, since competence is independent of ideology, the relationship between the evaluation of government competence and the vote choice should be rather close. In democracies, voters have the choice between multiple parties and in many cases the government is formed by a coalition. Specific interest in this chapter will be devoted to (intended) votes for any party in government or the prime minister's party.¹⁸ Data were

¹⁷Since these hypotheses are not derived from the comparative statics of the model, they will be called 'hypotheses' rather than 'propositions'.

¹⁸It should be noted that in the single-party case, a vote for the governing parties and the prime ministerial party are identical. Moreover, for the United States, which is the only presidential regime in the sample, the analysis will look at the president's party.

obtained from a large dataset assembled by Duch and Stevenson.¹⁹ It contains data from 163 election surveys from 18 Western democracies between 1979 and 2001.²⁰ These surveys were chosen from over 300 potential surveys as to maximise comparability of the questions that will be used to construct variables for the analysis. It should be noted that not all surveys were administered close to elections. In election years, voters were asked about their vote choice in that elections. In non-election years voters were asked a question about a hypothetical election: “If there were a general election tomorrow, which party would you support?”²¹ Although these two question formats are slightly different, Duch and Stevenson argue that they do not induce systematic bias in the analysis.²²

The main independent variable for the analysis relates to expenditure shocks, $\Delta Expend$. To operationalise this variable, data on general government expenditure were taken from the World Bank’s *World Development Indicators*. Since government expenditure has tended to grow in most countries over the period included in the analysis (a fact that is often attributed to Wagner’s Law²³), the variable will be converted into natural logarithms. To capture expenditure shocks, rather than mere levels of expenditure, the variable will also be constructed in percentage changes, rather than mere levels. It thus measures the year-to-year *growth* in public spending.

The following control variables will be included. At the individual level, the analysis will include a measure of a respondent’s ideological position, *Left-Right*. Self-placement is measured on an interval left-right scale where higher values indicate a more-right-wing position. Another key variable at the individual level captures subjective economic evaluations, *Economy*. Controlling for the performance of the aggregate economy is important for two reasons. Firstly, as opposed to theories of political business cycles, the theory of political budget cycles posits that electioneering manifests itself in fiscal policy rather than aggregate economic activity. Shi and Svensson explain that recent studies of electioneering “shifted away from studying the real effects of elections to studying the policy makers’ instruments partly because of the lack of empirical evidence, and partly because the government does not directly control real economic variables.”²⁴ A variable capturing subjective economic

¹⁹Duch, Raymond M. and Stevenson, Randolph T. (2005) Context and the Economic Vote: A Multilevel Analysis, *Political Analysis*, Vol. 13, No. 4; Duch and Stevenson (2008) (as in n. 15).

²⁰These surveys are largely taken from the Eurobarometer series and national election studies. Since national election studies only include data from election years it should be noted that non-election years are slightly underrepresented in the empirical sample.

²¹In this light, the remainder of this chapter will refer to vote intention as vote choice, since it is the choice in a hypothetical election.

²²Duch and Stevenson (2008) (as in n. 15), p. 45.

²³Wagner, Adolph (1893) *Grundlegung der Politischen Ökonomie*, Leipzig; CF Winter See also Wagner, Richard E. and Weber, Warren E. (1977) Wagner’s Law, Fiscal Institutions, and the Growth of Government, *National Tax Journal*, Vol. 30, No. 1.

²⁴Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and

perceptions is thus included to separate the effect of competence in fiscal policy from real economy effects. The variable is ordinal, where higher levels represent more favourable perceptions of economic performance.²⁵

Secondly, the theory posits that voters do not just reward governments for expenditure increases, but for shocks to competence. Competence is defined as the government's productivity, so more public goods at a *given* amount of taxation. It is thus important to control for economic activity. Controlling for subjective economic evaluations is reasonable since they can account for distorted perceptions in economic activity which may partly be due to a respondent's bias toward the incumbent. A better measure, however, may be an objective indicator of economic activity. For this reason, a measure of GDP growth, *Growth*, will be used alternatively.²⁶ Data on economic growth were also taken from the World Bank's *World Development Indicators*.

Lastly, an election dummy, *Elect*, will be included. Interacting the expenditure measure with the election dummy will allow to test whether the effect of expenditure shocks on vote intention differs between election and non-election years. This variable was obtained from a dataset assembled by Brender and Drazen.²⁷ For some countries these data were only available until 1999. Missing election data were coded according to the election indicator included in the World Bank's *Database of Political Institutions*.²⁸

Surveys were taken from the following countries: Australia, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom and the United States. For the United States, surveys are available for congressional and presidential elections. Congressional elections were excluded because competence signals can be expected to be largely associated with the president.²⁹ Moreover, ideological self-placement and expenditure data are not available for some countries, in particular in earlier periods. Altogether, data coverage allows for the inclusion of 140 surveys in the analysis. Descriptive statistics for all variables can be found in the appendix.

Why? *Journal of Public Economics*, Vol. 90, No. 8-9, p.68. See also Drazen, Allan (2000) The Political Business Cycle After 25 Years, *NBER Macroeconomics Annual*, Vol. 15.

²⁵At the individual level, only these two control variables will be included in order to preserve a reasonable number of observations. This motivation is commensurate with Duch and Stevenson (2008) (as in n. 15).

²⁶The literature on economic voting uses both subjective and objective measures of economic performance. For objective measures see, e.g., Van der Brug, Van der Eijk and Franklin (2007) (as in n. 15); for subjective measures see, e.g., Duch and Stevenson (2008) (as in n. 15).

²⁷Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 13).

²⁸Beck, Thorsten et al. (2001) New Tools in Comparative Political Economy: The Database of Political Institutions, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

²⁹C/f the discussion in chapter 8.

3.5 Estimation

The dataset is not in panel format: respondents are not identical across surveys from a specific country, and time series are not necessarily annual or of another consistent, equidistant measure. For these reasons, panel estimation methods as used in subsequent chapters are not appropriate. Another distinguishing feature of the data in this chapter is the multi-level structure. Individuals are nested in surveys which were conducted in different countries at different points of time. In accordance with the literature, a multi-level model will thus be estimated with individuals at Level 1 and surveys (representing countries and years) at Level 2.³⁰

Using multi-level methods over simple Ordinary Least Squares regression has a number of advantages.³¹ Arguably the most important reason for using multilevel models is to accurately account for uncertainty. The structure of the data implies that the units at Level 2 are always strictly fewer than the units at Level 1. Without accounting for this data structure, variables included at Level 2 will be replicated for all units at Level 1, which artificially decreases the size of the standard errors of these variables. Since standard errors are key to determining statistical significance, not accounting for this data structure will inflate certainty about the estimated effects, distorting inferences drawn from the analysis. Another important reason for the use of this format is that it allows to weight the explanatory contribution of individual surveys by their sample size. When estimating a relationship from pooled data as used in this study, only one coefficient will be reported for each variable. It seems intuitive that the estimated effects from larger samples should determine this coefficient to a greater extent than those from smaller samples. There is considerable variation in sample sizes across the surveys used in this analysis, ranging from roughly 300 to 1200 respondents per survey. Multi-level models account for these differences.³² Thus, they are the appropriate estimation method in this setting.

To test the two hypotheses, a set of multi-level models will be estimated, where individual respondents, i , are at Level 1 and surveys, j , are at Level 2. The individual structural model for the vote choice is:

$$VOTE_{ij} = \beta_{0j} + \lambda' \mathbf{X}_{ij} \quad (3.1)$$

³⁰This treatment is consistent with the analysis in Duch and Stevenson (2008) (as in n. 15).

³¹This discussion builds on Gelman, Andrew and Hill, Jennifer (2007) *Data Analysis Using Regression and Multilevel/Hierarchical Models*, Cambridge: Cambridge University Press, pp.6-7.

³²The intra-class correlation, which ranges from 0 to 1, expresses the relative values of individual- and group-level variances.

, where the outcome variable, $VOTE$, contains the measure for the vote choice, either for any government party or only the PM's party. The β 's are the parameters to be estimated. The vector λ captures the parameters for control variables which are contained in the matrix $\lambda' \mathbf{X}_{ij}$. These are the controls at the individual level, in other words the measures of gender, ideological placement, and economic retrospective evaluations. Since the dependent variable is binary, using the logit link function is appropriate. Accordingly, since the residual error variance follows directly from the probability of success (i.e. that $VOTE = 1$), it should be noted that the equation does not include an error term.

The individual-level constant, β_{0j} , will be modeled as a function of macro-level variables (Level 2):

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \Delta EXPEND_j + \delta' \mathbf{Z}_j + \epsilon_j \quad (3.2)$$

, where the γ 's are the parameters to be estimated. The key variable is government expenditure, $\Delta EXPEND$, and further controls at the macro-level are represented by the matrix $\mathbf{Z}_j$ and their parameters represented by the vector λ .³³ The error at the macro-level is captured by the term ϵ_j .

The equations will be jointly estimated, for election and non-election years respectively. This procedure allows to single out the effects of expenditure shocks to separately test the two hypotheses, *H3.1*, and *H3.2*. Accordingly, the effect of expenditure growth on the vote choice is expected to be positive and significant in non-election years and indistinguishable from zero in election years. However, as Gelman and Stern remind, this procedure does not reveal whether the effects are statistically different from each other.³⁴ To test whether the slopes are significantly different from each other in election and non-election years, the samples will be combined and the expenditure variable interacted with the election dummy. Only if this interaction term reaches conventional levels of statistical significance it can be concluded that the two effects are statistically different from each other.

3.6 Results

Table 3.1 shows the first set of results for the multi-level analysis, for government support as the dependent variable. The first three columns show the results without the inclusion of

³³To test the robustness of the analysis, this matrix of control variables will be extended later to account for other potentially obscuring factors.

³⁴Gelman, Andrew and Stern, Hal (2006) "The Difference Between "Significant" and "Not Significant" is not Itself Statistically Significant," *American Statistician*, Vol. 60, No. 4.

the economic controls. The results from columns one and two are consistent with hypotheses *H3.1* and *H3.2*: In non-election years (column one), the effect of expenditure growth on the vote choice is positive with a logit coefficient of 0.09. This effect is statistically significant at the 10% level. In election years (column two) the coefficient is negative but not statistically different from zero with a standard error that is larger than the coefficient estimate. However, it cannot be concluded that these coefficients are statistically significant. In fact, looking at the interaction term in column three, the coefficient is -0.14 with a standard error of 0.8, thus marginally failing the 10% hurdle of statistical significance.

Columns four through six include the Level 2 measure of real economic activity, economic growth. The size of the coefficients is largely comparable to those in columns one through three. Yet the interaction term reaches a modest 10% level of statistical significance. Including the subjective rather than the objective measure of economic performance in columns seven through nine again yields similar results. The coefficient estimates for expenditure are slightly larger for expenditure growth than in the previous models. In non-election years the logit coefficient is 0.12 which is statistically significant at the 5% level and in election years the coefficient is still statistically indistinguishable from zero. Separately, these effects provide support for hypotheses *H3.1* and *H3.2*. However, it cannot be concluded that the slopes are different from each other by any conventional measure of statistical significance. This is likely to be a consequence of the relatively small number of surveys (86 for non-election years and 54 for election years) but the insignificance of the interaction term dampens the strength of the findings.

The individual effects of expenditure growth on the vote choice in non-election and election years are illustrated in figures 3.1 and 3.2.³⁵ The figures plot the estimated intercepts for each survey, represented by black dots. The vertical lines represent 90% confidence intervals. The figures clearly illustrate that the effect of expenditure growth is positive in non-election years (figure 3.1) and virtually zero in election years (figure 3.2). Moreover, the figure shows that there are no outliers at the extreme ends of the expenditure variable which might have considerable leverage on the estimated effect and thus distort the results. Looking at the two figures, the difference in slopes is striking. However, it should be kept in mind that these differences are not statistically significant.

Table 3.2 presents the results for the same analysis with a different operationalisation of the dependent variable. Instead of looking at overall government support, the analysis for table 3.2 only looks at the vote for the prime ministerial party, which is arguably the

³⁵The figures are based on Gelman and Hill (2007) (as in n. 31).

Table 3.1: MLM regression results: Government support and expenditure growth

Dep. variable	Vote for parties in government (Gov.)								
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Election	No	Yes	-	No	Yes	-	No	Yes	-
<i>Level 1</i>									
Left-Right	0.22*** (0.02)	0.33*** (0.01)	0.28*** (0.01)	0.23*** (0.01)	0.33*** (0.01)	0.28*** (0.01)	0.22*** (0.01)	0.32*** (0.01)	0.26*** (0.01)
Economy							-0.67*** (0.01)	-0.64*** (0.01)	-0.66*** (0.01)
<i>Level 2</i>									
Cons.	-0.17*** (0.05)	-0.15*** (0.05)	-0.17*** (0.04)	-0.34*** (0.08)	-0.42*** (0.09)	-0.39*** (0.07)	1.30*** (0.06)	1.18*** (0.06)	1.26*** (0.05)
Growth				0.02** (0.01)	0.04*** (0.01)	0.02*** (0.01)			
ΔExpend	0.09* (0.05)	-0.04 (0.05)	0.09* (0.05)	0.09* (0.09)	-0.05 (0.05)	0.09* (0.05)	0.12*** (0.05)	0.01 (0.06)	0.12*** (0.05)
Elect			0.03 (0.07)			0.06 (0.07)			-0.04 (0.07)
Elect x ΔExpend			-0.14 (0.08)			-0.14* (0.07)			-0.11 (0.08)
No. Obs.	58680	51800	110480	58680	51800	110480	58680	51800	110480
No. Surveys	86	54	140	86	54	140	86	54	140
AIC	78361	68246	146677	78357	68237	14665	74818	65770	140649
BIC	78406	68290	146744	78411	68290	146742	74872	65823	140726

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses

Figure 3.1: Intercepts: Government support and expenditure growth in non-election years

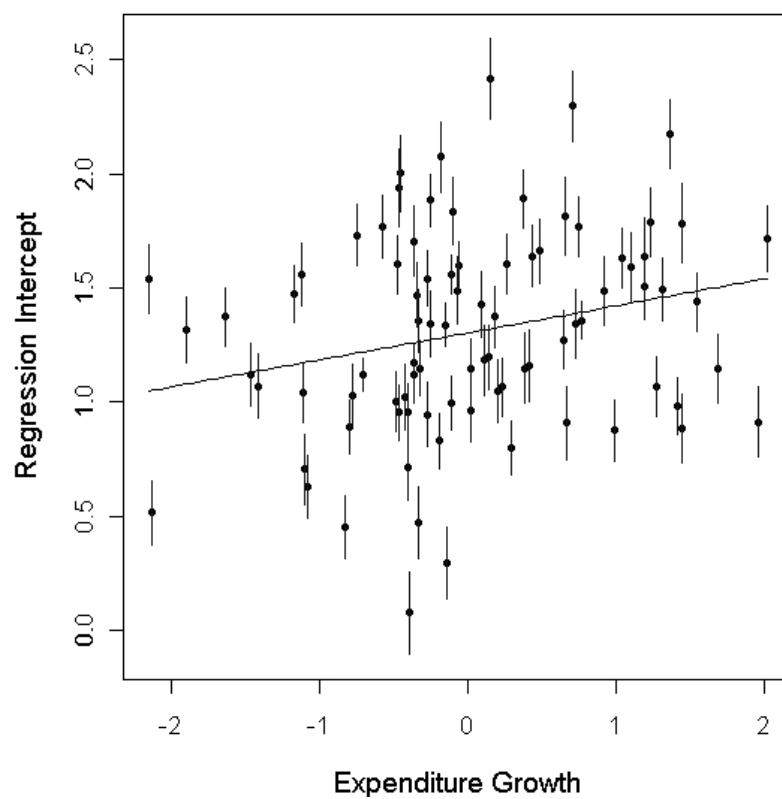
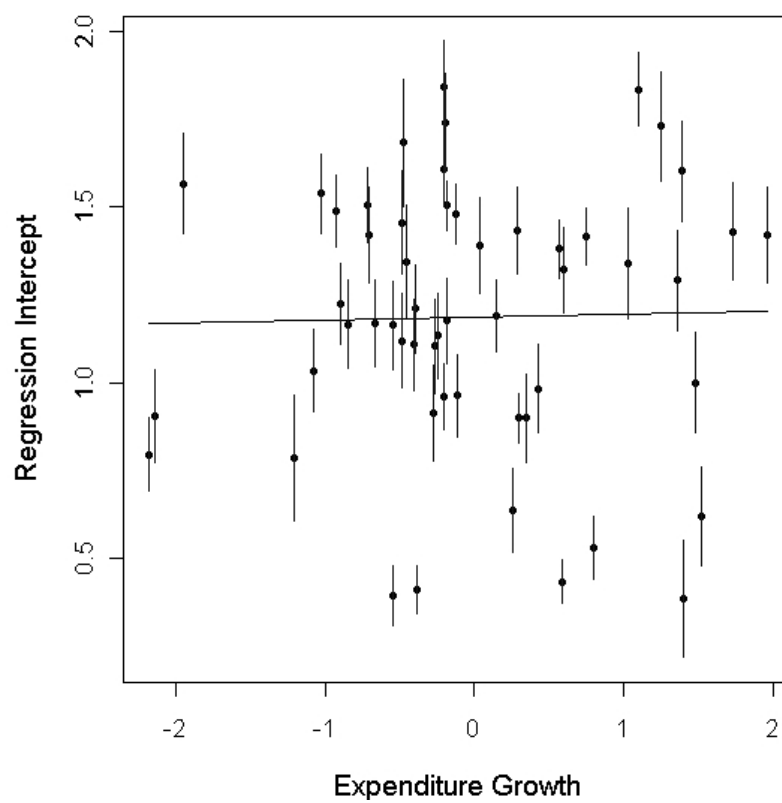


Figure 3.2: Intercepts: Government support and expenditure growth in election years



party which is assigned the greatest responsibility in policy. Again, columns one through three present the results without the economic controls; columns four through six include the objective measure of economic performance, and columns seven through nine include the subjective measure.

The effects are largely comparable with those in table 3.1. The effect of expenditure growth on the prime ministerial vote appears to be somewhat larger than for government parties - although this may be due to the fact that prime ministers are held more accountable for government policy than other coalition members. However, these differences are not statistically significant, so this possibility cannot be supported with this relatively small sample. The differences between election and non-election years are more pronounced though. For example, in column one, i.e. non-election years, the logit coefficient for expenditure growth is 0.14 which is significant at the 5% level; in election years it is -0.9 which is still statistically insignificant. The interaction effect in column three is thus considerably large with a logit coefficient of -0.24 which is statistically significant at the 5% level.

This pattern is consistent across specifications in table 3.2. The effect of government growth in non-selection years is positive and significant, with significance levels ranging from 1% (when including the economic controls in columns four and seven) to 5% (without economic controls in column one). In non-election years the effect is consistently insignificant. This is in accordance with hypotheses *H3.1* and *H3.2*. The interaction effect is statistically significant at the 1% level in column six and at the 5% level in columns three and nine. This means that the slopes are also statistically significant, further bolstering the strength of the two hypotheses.

Figures 3.3 and 3.4, again, illustrate the effects represented in table 3.2 graphically. The upward sloping line in figure 3.3 illustrates the estimated effect of expenditure growth on vote intention for the prime ministerial party. The line is positive and does not seem to be driven by any outliers. Figure 3.4, on the other hand, plots the effect for election years. The downward sloping line indicates the estimated effect of expenditure growth on the vote choice. The difference between the slopes is statistically significant, lending further credibility to the empirical findings in favour of hypotheses *H3.1* and *H3.2*.

The empirical model is a logit model which means that the coefficients cannot be easily interpreted since the dependent variable is calculated in log odds. King *et al.* argue that in these cases, simulations should be carried out to illustrate the estimated effects: “We recommend statistical simulation as an easy method of computing quantities of interest and their uncertainties. Simulation can also help researchers understand the entire statistical

Table 3.2: MLM regression results: PM support and expenditure growth

Dep. variable	Vote for the prime-ministerial party (PM)								
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Election	No	Yes	-	No	Yes	-	No	Yes	-
<i>Level 1</i>									
Left-Right	0.25*** (0.01)	0.34*** (0.01)	0.29*** (0.01)	0.25*** (0.01)	0.34*** (0.01)	0.29*** (0.01)	0.24*** (0.01)	0.33*** (0.01)	0.28*** (0.01)
Economy							-0.65*** (0.01)	-0.67*** (0.01)	-0.66*** (0.01)
<i>Level 2</i>									
Cons.	-0.42*** (0.05)	-0.48*** (0.08)	-0.43 (0.05)	-0.72*** (0.08)	-0.87*** (0.13)	-0.78 (0.08)	0.98*** (0.06)	0.90*** (0.08)	0.99*** (0.06)
Growth				0.03*** (0.01)	0.05*** (0.02)	0.04*** (0.01)			
Δ Expend	0.14** (0.05)	-0.09 (0.08)	0.14** (0.06)	0.13*** (0.05)	-0.10 (0.07)	0.13** (0.05)	0.16*** (0.06)	-0.04 (0.08)	0.17*** (0.06)
Elect			-0.03 (0.08)			0.03 (0.08)			-0.09 (0.09)
Elect x Δ Expend			-0.24** (0.09)			-0.23*** (0.08)			-0.21** (0.10)
No. Obs.	58680	51800	110480	58680	51800	110480	58680	51800	110480
No. Surveys	86	54	140	86	54	140	86	54	140
AIC	75726	68237	140622	75710	64836	140597	72546	62332	134916
BIC	75770	68290	140689	75764	64889	140674	72600	62386	134993

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses

Figure 3.3: Intercepts: PM support and expenditure growth in non-election years

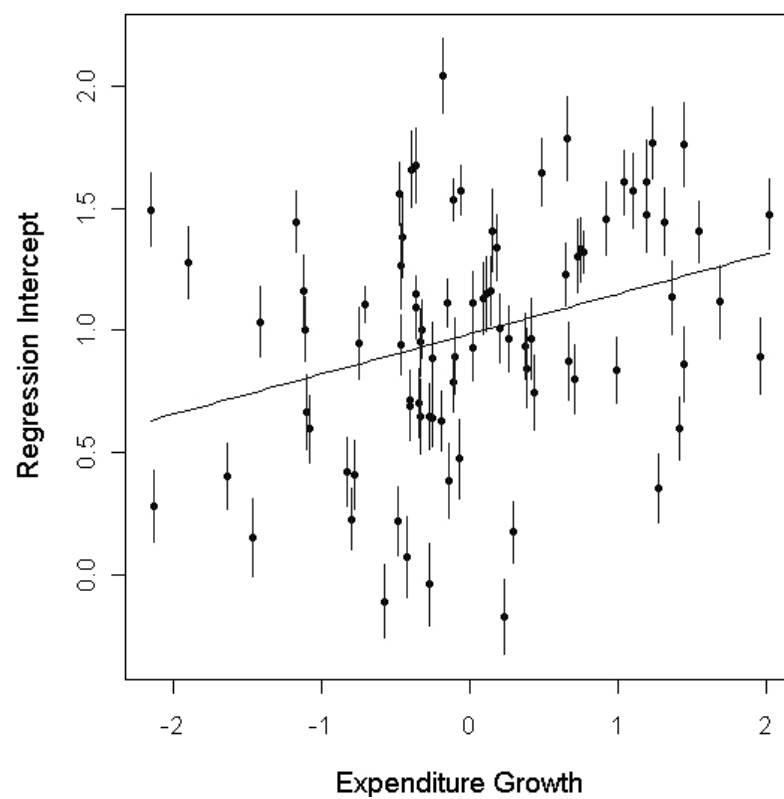


Figure 3.4: Intercepts: PM support and expenditure growth in election years

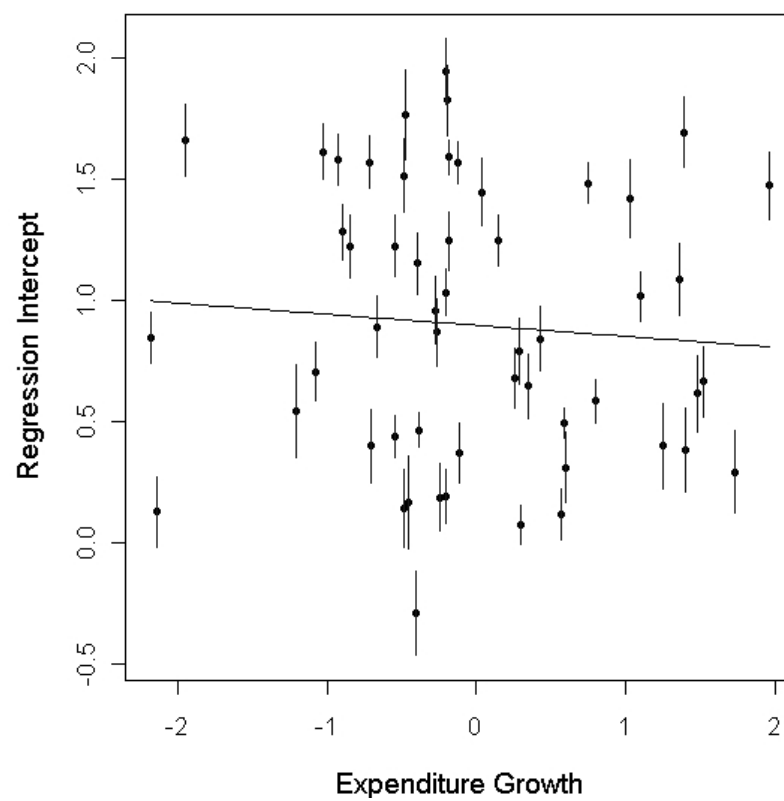


Table 3.3: Expected values and differences

Dep. Variable	Gov.	Gov.	PM	PM
Election	No	Yes	No	Yes
Model	(7)	(8)	(7)	(8)
$E(Y X_{min})$	0.40 (0.03)	0.45 (0.03)	0.30 (0.03)	0.39 (0.05)
$E(Y X_{p25})$	0.45 (0.01)	0.45 (0.01)	0.36 (0.01)	0.37 (0.02)
$E(Y X_{p50})$	0.46 (0.01)	0.45 (0.01)	0.38 (0.01)	0.37 (0.02)
$E(Y X_{p75})$	0.48 (0.01)	0.45 (0.02)	0.40 (0.01)	0.36 (0.02)
$E(Y X_{max})$	0.52 (0.03)	0.46 (0.03)	0.46 (0.03)	0.34 (0.04)
$E(Y X_{p50})$ - $E(Y X_{min})$	0.06** (0.03)	0.00 (0.03)	0.07*** (0.02)	-0.02 (0.04)
$E(Y X_{max})$ - $E(Y X_{p50})$	0.06** (0.03)	0.01 (0.03)	0.09*** (0.03)	-0.02 (0.04)

All expected values are statistically significant:

For differences in expected values: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard deviations in parentheses

model, take full advantage of the parameter estimates, and convey findings in a reader-friendly manner.”³⁶ Table 3.3 thus calculates the expected values for different levels of the expenditure variable based on columns seven and eight of tables 3.1 and 3.2 (which include the subjective measure of economic performance).³⁷ Expected values ($E(Y|X)$) are calculated for the minimum and maximum values as well as the 25th percentile (p_{25}), the median (p_{50}), and the 75th percentile (p_{75}). Moreover, the table reports simulated *changes* (first differences) in expenditure growth from the minimum to the median ($E(Y|X_{p50}) - E(Y|X_{min})$) and the median to the maximum ($E(Y|X_{max}) - E(Y|X_{p50})$) respectively. Standard deviations are given in parentheses.³⁸

Table 3.3 illustrates how support for the government (columns one and two) and the prime ministerial parties (columns three and four) changes with higher values of expenditure growth. In non-election years, the expected vote for government parties increases from 0.4 at the minimum of expenditure growth to 0.52 at its maximum, which corresponds to a change of 0.12 in the probability of voting for the incumbent parties. This difference is thus

³⁶King, Gary, Tomz, Michael and Wittenberg, Jason (2000) Making the Most of Statistical Analyses: Improving Interpretation and Presentation, *American Journal of Political Science*, Vol. 44, No. 2, p.349.

³⁷These results were calculated with an add-on package called *Zelig* which was designed for the use of the statistical programme *R*. See Imai, Kosuke, King, Gary and Lau, Olivia (2007) *Zelig: Everyone's Statistical Software*, (URL: <http://gking.harvard.edu/zelig>); Imai, Kosuke, King, Gary and Lau, Olivia (2008) Toward a Common Framework for Statistical Analysis and Development, *Journal of Computational and Graphical Statistics*, Vol. 17, No. 4 for the programme and Bailey, Delia and Alimadhi, Ferdinand; Imai, Kosuke, King, Gary and Lau, Olivia, editors (2007) *Logit.mixed: Mixed Effects Logistic Model*, (URL: <http://gking.harvard.edu/zelig>) for logit multilevel-models in *Zelig*.

³⁸It should be noted that these are standard *deviations* rather than standard *errors* since these quantities are based on simulations.

sizeable. For prime ministerial parties the predicted values are similar, albeit slightly smaller which is a result of the pervasiveness of coalition government in the countries included in the sample. Predicted values range from 0.3 at the minimum value of expenditure growth to 0.46 at its maximum, which is a difference of 0.16, which is again a sizeable change. In election years, there is virtually no increase in the probability of re-election for government parties and only a negligible change for the prime ministerial party.

The bottom cells of table 3.3 serve to further examine these changes and test their statistical significance. They show that in non-election years, a change from the minimum value of expenditure growth to its median value results in a change of 0.06 in the probability of a vote for the government. This effect is similar for a change from the median to the maximum value of expenditure growth. These changes are statistically significant at the 5% level. A similar story holds for prime ministerial party with slightly more pronounced changes in non-election years (between 0.7 and 0.9) and a higher level of statistical significance (1%). These changes are far from any conventional measure of statistical significance for election years. Thus, table 3.3 further illustrates the strength of hypotheses *H3.1* and *H3.2*.

How robust are these results to alternative specifications? To answer this question, several additional control variables were considered. For one, the subjective and objective economic controls were included jointly. This strategy is problematic because both measures are strongly related to each other. Yet the results are robust to this specification. Further, unemployment and inflation were added to the model with data also obtained from the World Bank's *World Development Indicators*. The results are robust to these additions. To control for differences in the electoral system, a dummy variable was taken from the World Bank's *Database of Political Institutions*. The results are also robust to this additional control variable. Lastly, a control variable was included for the vote share of the coalition and the prime ministerial parties respectively. Data were taken from the *Database of Political Institutions* for coalition government and from Duch and Stevenson for the prime ministerial party.³⁹ The coalition results are robust to this specification whereas the prime ministerial results decrease in significance. However, even for the prime ministerial party, the effects postulated by hypotheses *H3.1* and *H3.2* are still borne out by the data. Overall, the support for the moral hazard model of political budget cycles is thus rather strong.

³⁹Duch and Stevenson (2005) *Political Analysis* (as in n. 19); Duch and Stevenson (2008) (as in n. 15).

3.7 Conclusion

The moral hazard model of political budget cycle is prevalent in the literature. It will also form the basis of all theoretical arguments in this thesis. It is thus important to test its assumptions before relying on it. This chapter has shown that the model receives empirical support: voters reward governments for positive expenditure shocks in non-election years because they are indicative of an increase in the government's administrative efficiency, in other words competence. Voters know that governments have an incentive to *feign* competence in non-election years. Thus, they *expect* positive expenditure shocks and expenditure growth will thus have no impact on the vote choice in election years. This mechanism is borne out well by the data. It thus contrasts with the results found by Brender and Drazen which may be due to an inadequate model specification.⁴⁰

One potential draw-back of the analysis is that it only focuses on expenditure. Arguably, governments could also lower taxes to feign competence. For two reasons it is sensible to focus on expenditure rather than taxes. Firstly, the model predicts that the government will set its optimal tax rate, so the tax rate is fixed. Since the analysis above is designed to test the empirical implications of the model it makes sense to focus on expenditure which is the budget item that varies in the model. Secondly, government spending is more suitable for electioneering because spending on existing projects can be increased relatively simply whilst tax cuts will require legislative changes of the tax code. However, it is still sensible, to abstract from this restrictive assumption of the model, to also look at taxes.

Brender and Drazen examine political budget cycles without explicitly modeling the underlying process based on government competence.⁴¹ They also look at political budget cycles in taxes, operationalising taxes with tax revenue. Repeating the above analysis with this measure does not result in statistically robust results. There are several possible reasons for this. For one, as explained above, it may be more difficult for governments to change the tax code in election years than simply increase expenditure. Methodologically, tax revenue is not a very good measure of the tax rate since it is heavily affected by real economic activity. Lastly, the lack of robustness may be a result of the sample size. There are relatively few observations for election years in the dataset used for this chapter and even some of the results for expenditure are slightly unstable (see table 3.1.). Increasing the sample size might yield more conclusive results which depends on the future availability of data. However, at least for expenditure, as predicted by the formal model, the results provide support for the

⁴⁰Brender and Drazen (2008) *The American Economic Review* (as in n. 14).

⁴¹Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 13).

moral hazard model of political budget cycles.

3.8 Appendix

Table A.3.1: Descriptive statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
<i>Dependent</i>						
Gov.	110480	0.45	0	0.50	0	1
PM	110480	0.39	0	0.49	0	1
<i>Independent Level 1</i>						
Left-Right	110480	0.00	-0.08	1.03	-3.26	2.96
Economy	110480	2.08	2	0.82	1	3
<i>Independent Level 2</i>						
Δ Expend	110480	-0.02	-0.15	0.83	-2.18	2.02
Elect	110480	0.47	0	0.50	0	1
Growth	110480	7.80	6.20	4.72	-1.27	25.77

Part II

Costs and Benefits

Chapter 4

Government Popularity and Polarisation

4.1 Introduction

Former British prime minister Gordon Brown saw his approval rating in a YouGov poll fall on a midpoint scale from plus 48 in August 2007 to a staggering minus 37 in April 2008. *The Sunday Times* commented that “[t]he collapse is the most dramatic of any modern-day prime minister, worse even than Neville Chamberlain who in 1940 dropped from plus 21 to minus 27 after Hitler’s invasion of Norway.”¹ Chamberlain failed to recover from this considerable drop in support, yet the Tories could cling on to power under a new leader, Winston Churchill. In 2009 and 2010, Labour managed to catch-up considerably with its Tory nemesis and shortly before the next British general election in May 2010, Gordon Brown was considered to have a fair chance of staying in office. This anecdote is interesting because it illuminates two rather different pre-election scenarios: in 2008, the incumbent’s electoral defeat seemed imminent; in 2010, electoral competition was neck-on-neck. How will these possible scenarios be reflected in fiscal policy?²

This chapter examines this question on a more general level for 16 OECD countries by looking at pre-election accumulation of public debt conditional on government popularity. The analysis suggests that the answer is: it depends. More specifically, the effect of government popularity on pre-election deficits depends on the degree of party polarisation. Assuming that political candidates are both office-seekers and policy-seekers, polarisation determines the relative importance of office versus policy.³ Low polarisation originates from relatively similar policy platforms and if candidates do not substantially differ on policies, i.e. polarisation is low, the office-seeking element will dominate. As polarisation increases, policy-seeking will gain in relative importance. This chapter argues that the relative importance of office and policy fundamentally shapes the strategic environment and thus determines different incentive structures for pre-electoral borrowing.

Low polarisation results in the political environment Downs imagined in his seminal work:⁴ candidates are mainly motivated by the perks from office, such as power and pres-

¹Oliver, Jonathan and Oakeshott, Isabel (2008) Terror Revolt Rocks Gordon Brown: PM in Record Poll Slide, *The Sunday Times*, 13 April (URL: <http://www.timesonline.co.uk/tol/news/politics/article3736241.ece>).

²For this specific case in question, the Labour government did embark on a spending spree shortly before the election. Upon being ousted from office at the polls in May 2010, Liam Byrne, Labour’s outgoing minister at the Treasury, left the following note to his successor: “Dear chief secretary, I’m afraid to tell you there’s no money left.” Jagger, Suzy (2010) Labour Minister Liam Byrne Left Note on Desk: ‘There’s no Money Left’, *The Times (Online)*, 17 May (URL: <http://business.timesonline.co.uk/tol/business/economics/article7128665.ece>).

³For a discussion of candidates/ parties as office- versus policy-seekers, see in particular Müller, Wolfgang C. and Strøm, Kaare (1999) *Policy, Office, or Votes? How Political Parties in Western Europe Make Hard Decisions*, Cambridge: Cambridge University Press.

⁴Downs, Anthony (1957) *An Economic Theory of Democracy*, New York, NY: Harper.

tige, or what Rogoff terms ‘ego-rents.’⁵ If policy platforms are similar and thus not a very decisive selection criterion for voters, the candidates’ administrative competence gains salience, giving governments an incentive to appear competent. Under the condition that voters cannot perfectly observe the deficit, governments can borrow to increase public expenditure or cut taxes in an attempt to suggest that the resources stem from a boost in administrative competence. The closer the election between the incumbent and a challenger is anticipated to be, the greater is the likelihood that a boost to competence will suffice to swing the election in the government’s favour. Under low polarisation the pre-electoral deficit is thus expected to be at its maximum when the race is neck-on-neck.

If polarisation is high, candidates run on considerably different policy platforms. For a government, losing an election then does not only mean foregoing its ego-rents; it will also receive disutility from seeing the winning candidate’s policy platform implemented.⁶ Incumbents may then be inclined to exploit the intertemporal characteristics of borrowing. Borrowing allows agents to finance present consumption with future payments. Governments that anticipate defeat may then spend on their desired policies, leaving the financing to the future when the next government is in power. Since borrowing is costly, the relative benefit of such intertemporal transfers increases in the likelihood of electoral defeat. Hence, the higher the degree of polarisation is, the more likely unpopular governments will be to incur that cost of borrowing in return for their preferred policies. This effect is likely to trump the effect of signalling competence which is why higher degrees of polarisation can be expected to make the impact of government popularity on pre-electoral deficits increasingly linear. The key implications of the argument receive empirical support from the data.

The argument will be developed as follows. Section two embeds the argument in the related literature. The third section develops the theoretical model and derives testable hypotheses. Section four introduces the data used for the empirical estimation. The fifth section discusses the estimation procedure and section six presents the results. The last section concludes.

4.2 Related Literature

In a representative democracy, governing power is delegated to politicians to make policy

⁵Rogoff, Kenneth (1990) Equilibrium Political Budget Cycles, *The American Economic Review*, Vol. 80, No. 1.

⁶For an interpretation of candidates as policy-seekers see, in particular, Wittman, Donald A. (1973) Parties as Utility Maximizers, *The American Political Science Review*, Vol. 67; Wittman, Donald A. (1983) Candidate Motivation: A Synthesis of Alternative Theories, *The American Political Science Review*, Vol. 77, No. 1. For a discussion of policy- versus office-seeking motivations, see Müller and Strøm (1999) (as in n. 3).

on behalf of the people. The literature has established that in many cases, this delegation works rather well, as politicians respond to changes in public opinion in order to increase their popularity. This link between voter preferences and policy outcomes is encompassed in the concept of *dynamic representation*.⁷ Stimson *et al.* explain that “[i]f public opinion changes and public policy responds, this is dynamic representation.”⁸ In this light, politicians receive information about the popularity of certain policies and can adjust them accordingly as to meet voters’ preferences.⁹

As was argued in part I of this thesis, political budget cycles constitute a case in which the delegation mechanism works less well. Generally, politicians are unlikely to respond to public opinion out of sheer idealism and selflessness but rather because they seek re-election and a more responsive government is more attractive to voters. The literature on political budget cycles shows that when governments are not perfectly monitored by voters, they have incentives to shirk and pursue policies that are not in the interest of the electorate.¹⁰ Again, opinion polls provides them with valuable information, in particular with information on their own popularity which is intrinsically linked to the probability of re-election. To the extent that public debt is costly, for voters and politicians alike, the probability of re-election should have a significant effect on the incentive to borrow strategically.

Frey and Schneider were among the first scholars to point to the relationship between government popularity and electioneering.¹¹ One key issue arising from the literature sparked off by their argument pertains as to the functional form of this relationship. Schultz examines the impact of government popularity on transfer payments in the United Kingdom and finds a linear relationship.¹² Price re-analyses Schultz’s data and reports a non-linear rela-

⁷ McCrone, Donald J. and Kuklinski, James H. (1979) The Delegate Theory of Representation, *American Journal of Political Science*, Vol. 23, No. 2; Page, Benjamin I. and Shapiro, Robert Y. (1992) *The Rational Public: Fifty Years of Trends in Americans’ Policy Preferences*, Chicago, IL: University of Chicago Press; Stimson, James A., MacKuen, Michael B. and Erikson, Robert S. (1995) Dynamic Representation, *The American Political Science Review*, Vol. 89, No. 3.

⁸ Stimson, MacKuen and Erikson (1995) (as in n. 7), p. 543

⁹ For empirical applications see, e.g., Canes-Wrone, Brandice and Shotts, Kenneth W. (2004) The Conditional Nature of Presidential Responsiveness to Public Opinion, *American Journal of Political Science*, Vol. 48, No. 4; Hobolt, Sara Binzer and Klemmensen, Robert (2005) Responsive Government? Public Opinion and Government Policy Preferences in Britain and Denmark, *Political Studies*, Vol. 53, No. 2; Hobolt, Sara Binzer and Klemmensen, Robert (2008) Government Responsiveness and Political Competition in Comparative Perspective, *Comparative Political Studies*, Vol. 41, No. 3; Soroka, Stuart N. and Wlezien, Christopher (2005) Opinion-Policy Dynamics: Public Preferences and Public Expenditure in the United Kingdom, *British Journal of Political Science*, Vol. 35, No. 4; Wlezien, Christopher and Soroka, Stuart N. (2007) The Relationship Between Public Opinion and Policy, In Dalton, Russell and Klingemann, Hans-Dieter, editors *The Oxford Handbook of Political Behavior*, Oxford: Oxford University Press; Soroka, Stuart N. and Wlezien, Christopher (2010) *Degrees of Democracy: Politics, Public Opinion and Policy*, New York, NY: Cambridge University Press.

¹⁰ See in particular the model discussion in chapter 2.

¹¹ Frey, Bruno S. and Schneider, Friedrich (1978b) An Empirical Study of Politico-Economic Interaction in the United States, *The Review of Economics and Statistics*, Vol. 60; Frey, Bruno S. and Schneider, Friedrich (1978a) A Politico-Economic Model of the United Kingdom, *The Economic Journal*, Vol. 88, No. 350.

¹² Schultz, Kenneth A. (1995) The Politics of the Political Business Cycle, *British Journal of Political*

tionship.¹³ Alt and Rose, looking at the U.S. states, also find a non-linear relationship.¹⁴ Yet Pettersson-Lidbom reports a linear relationship for Swedish municipality elections.¹⁵ These empirical studies thus do not conclusively capture the relationship between government popularity and the deficit in the vicinity of elections.

If empirical studies find different functional forms of a relationship in different countries, it is likely that there are structural underlying differences that condition the nature of the relationship. Rogoff and Sibert examine the effect of popularity conditional on government competence. They conclude from their adverse selection model of political budget cycles that “although an increase in popularity may cause the incumbent to cheat less if its competency shock is high, it will cheat more if its competency is low.”¹⁶ As the chapters in part I of this thesis have shown, the adverse selection model has serious empirical shortcomings. Moreover, government competence will certainly vary across governments within each country but it seems unlikely that there will be any cross-sectional, structurally-induced variation in competence. This chapter argues that polarisation is a superior factor in explaining differences in the functional relationship between government popularity and pre-election debt across countries.

The argument combines two hitherto separate strands in the literature. One strand looks at governments maximising their probability of winning office, subject to the cost induced by strategic debt. Thus, initially, lower levels of popularity increase the incentive to borrow in order to ‘turn around’ the election. Yet, as Price argues, once governments are “sufficiently unpopular, the costs [of borrowing] may greatly exceed the benefits (of re-election).”¹⁷ This gives rise to the parabolic relationship found by some empirical studies.

Yet, this argument assumes that governments fully internalise the cost of borrowing. Other studies have shown, however, that if governments care about policy, their incentive to borrow strictly increases as they become more unpopular. Tabellini and Alesina as well as Persson and Svensson show that governments can use public debt if they want to constrain future policy-makers in making decisions over the magnitude or the composition of government expenditure.¹⁸ Alesina and Tabellini show that this incentive is exacerbated by

Science, Vol. 25, No. 1.

¹³Price, Simon (1998) Comment on ‘The Politics of the Political Business Cycle’, *British Journal of Political Science*, Vol. 28, No. 1.

¹⁴Alt, James E. and Rose, Shanna S. (2007) Context-Conditional Political Budget Cycles, In Boix, Carles and Stokes, Susan C., editors *The Oxford Handbook of Comparative Politics*, Oxford, New York, NY: Oxford University Press.

¹⁵Pettersson-Lidbom, Per (2001) An Empirical Investigation of the Strategic Use of Debt, *The Journal of Political Economy*, Vol. 109, No. 3.

¹⁶Rogoff, Kenneth and Sibert, Anne (1988) Elections and Macroeconomic Policy Cycles, *The Review of Economic Studies*, Vol. 55, No. 1, p. 2.

¹⁷Price (1998) (as in n. 13), p. 220.

¹⁸Alesina, Alberto and Tabellini, Guido E. (1990) A Positive Theory of Fiscal Deficits and Government

polarisation.¹⁹ Their argument is intuitive because the more dissimilar the likely successor's preferences are from the incumbent's, the more resources an unpopular government will be willing to devote to constraining future policy.

Alt and Lassen show that, indeed, higher polarisation results in a more pronounced political budget cycle.²⁰ This chapter arrives at similar conclusions, however, it develops the argument further by treating polarisation as a factor that moderates the effect of government popularity on political budget cycles. The effect of government popularity on strategic debt has to this point not been studied in a cross-national format. By looking at deficits, popularity, and polarisation in 16 OECD countries, this chapter thus constitutes the first empirical study of this kind.

4.3 Theory

Alt and Lassen present a moral hazard model that includes polarisation over private versus public expenditure.²¹ This chapter follows the modeling approach of Alesina and Tabellini and polarisation is thus over different types of public expenditure.²² Substantively, however, the adopted approach has little influence over the generated predictions. The model developed in this section builds on Persson and Tabellini's and Shi and Svensson's adaptation of the career concerns competence model.²³ As in their model, voter i 's utility in period t can be expressed as follows:

$$U_s^i = \sum_{s=t}^T \beta^{s-t} [\gamma^i f_s + (1 - \gamma^i) g_s + u(c_s) + \theta^i z^j] \quad (4.1)$$

where β is a discount factor which is assumed to be one. There are two public goods in the economy, good f and good g , from which voters receive linear utility. The term γ^i indicates a preference voters have for one good over the other. For simplicity it is assumed that $\gamma^i = \frac{1}{2}, \forall i$ which implies indifference about the composition but not the quantity of public

Debt, *The Review of Economic Studies*, Vol. 57, No. 3; Persson, Torsten and Svensson, Lars E.O. (1989) Why Would a Stubborn Conservative Run a Deficit: Policy with Time-Inconsistent Preferences, *Quarterly Journal of Economics*, Vol. 104. For a more thorough discussion of these models see chapter 2.4 of this thesis.

¹⁹Alesina and Tabellini (1990) (as in n. 18).

²⁰Alt, James E. and Lassen, David Dreyer (2006a) Fiscal Transparency, Political Parties, and Debt in OECD Countries, *European Economic Review*, Vol. 50, No. 6; Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3.

²¹Alt and Lassen (2006b) *American Journal of Political Science* (as in n. 20).

²²Alesina and Tabellini (1990) (as in n. 18).

²³Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press; Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9.

goods. Voters are assumed to have a non-economic bias toward either the incumbent or the challenger which is represented by the term $\theta^i z^j$, where $z^j = \{-\frac{1}{2}, \frac{1}{2}\}$ respectively for the incumbent party and the challenger. Moreover, $\theta^i \sim \text{unif}[-\frac{1}{2} + \nu; \frac{1}{2} + \nu]$, where $\nu \in [-\frac{1}{2}, \frac{1}{2}]$. Note that ν is exogenously determined and reflects the challenger's popular advantage on non-economic policy; that is *higher* values of ν represent a *lower* non-economic popularity of the incumbent party. The term $u(c_t)$ represents the utility from private consumption c , which is given by:

$$c_t = y - \tau_t \quad (4.2)$$

with y representing income and τ indicating taxation. Taxes are lump sum and do not change proportionally with income. Overall government expenditure $f_t + g_t$ is given by:

$$f_t + g_t = \tau_t + d_t - R(d_{t-1}) + \eta_t^j \quad (4.3)$$

where τ is tax revenue and d is the deficit. $R(d)$ is the cost of the deficit, for which it is assumed that $R(0) = 0$, $R'(d) > 0$, $R'(0) \geq 1$, and $R''(d) > 0$.²⁴ η represent competency and is assumed to follow a moving average process:

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j, \quad \forall j = \{a, b\} \quad (4.4)$$

The values for the competence shock μ are distributed identically and independently (*iid*) with zero mean and finite variance. Further μ has a distribution function $F(\mu)$ and a density function $f(\mu)$. For the incumbent government a , as well as the challenger b utility is given by:

$$U_s^j = \sum_{s=t}^T \beta^{s-t} [\gamma^j f_s + (1 - \gamma^j) g_s + u(c_s) + X] \quad (4.5)$$

X indicates ego-rents which are utility derived from holding office. Candidates share the voters' preferences over public consumption. However, as opposed to voters, candidates can differ in their preferences over the composition of public expenditure, indicated by the value of $\gamma^j \in [0, 1]$. For candidates a and b it will further be assumed that $\gamma^a = 1 - \gamma^b$. Since utility from public consumption is linear the optimal choice of f and g is a corner solution unless $\gamma^j = \frac{1}{2}$. In all other cases the marginal utility from one good is higher than from the other good and all public resources will be spent on that good. For each candidate j it thus

²⁴See chapter 5.3 for a discussion of this particular specification of the cost function.

holds that:

$$f_t^* = \tau_t + d_t - R(d_{t-1}) + \eta_t^j \quad \text{and} \quad g_t^* = 0 \quad \text{if} \quad \gamma^j < \frac{1}{2} \quad (4.6)$$

$$g_t^* = \tau_t + d_t - R(d_{t-1}) + \eta_t^j \quad \text{and} \quad f_t^* = 0 \quad \text{if} \quad \gamma^j > \frac{1}{2} \quad (4.7)$$

$$f_t^* = g_t^* = \frac{1}{2}(\tau_t + d_t - R(d_{t-1}) + \eta_t^j) \quad \text{if} \quad \gamma^j = \frac{1}{2} \quad (4.8)$$

This means that candidate j will either only provide one good (if $\gamma^j \neq \frac{1}{2}$) or an equal amount of both goods (if $\gamma^j = \frac{1}{2}$).²⁵ From equations 4.5 through 4.8 it is evident that candidate j 's utility from public consumption is larger or equal to one half when in office and smaller or equal to one half when in the opposition, depending on the incumbent's value of γ^j . Equilibrium deficit in off-election years is zero since the marginal utility of public consumption is constant at one ($g'(d) = 1$) and the marginal cost of borrowing is greater or equal than one and increasing when the deficit exceeds zero ($R'(0) \geq 1$; $R''(0) > 0$). Accordingly, the cost of servicing outstanding debt is zero. The equilibrium tax rate τ^* is determined by maximising the government's utility:

$$\max_{\tau} \quad E_t[\gamma^j f_t^* + (1 - \gamma^j)g_t^* + u(c_t) + X] \quad (4.9)$$

$$s.t. \quad f_t + g_t = \tau_t + \eta_t^j \quad (4.10)$$

The solution to this maximisation problem, solving for the equilibrium tax rate τ^* , is:²⁶

$$\tau_t = \tau^* = y - u_c^{-1}(\gamma^a) = y - u_c^{-1}(1 - \gamma^b) \quad (4.11)$$

Since $\gamma^a = 1 - \gamma^b$, it is evident that the two candidates desire the same tax rate. Apart from the tax rate, candidates also differ in their competence in delivering public goods given the revenue they collect. Indifferent voters will vote for the candidate that is expected to be more competent. In the case of candidate b , the challenger, voters have no information about competence. They will thus form their expectations on the mean value of μ which is zero. From equations 4.3 and 4.4, expected government expenditure of candidate b in the next period, $t + 1$ is thus:

$$E_t[f_{t+1}^b + g_{t+1}^b] = \tau^* - E_t[R(d_t^*)] \quad (4.12)$$

²⁵Technically, any combination of the two public goods, f and g , would give the candidate the same utility if $\gamma^j = \frac{1}{2}$. Assuming that an equal amount of both goods will be provided does not alter the generality of the predictions.

²⁶The solution to this maximisation problem is described in more detail in the appendix.

where d^* is the equilibrium deficit in the election year, yet to be derived. The expected government expenditure for the incumbent a can be derived in a similar way, except that voters observe the government's competence in period $t - 1$:

$$E_t[f_{t+1}^a + g_{t+1}^a] = \tau^* - E_t[R(d_t^*)] + E_t[\mu_t^a] \quad (4.13)$$

Voter i will vote for candidate a if:²⁷

$$E_t[\mu_t^a] - \theta^i \geq 0 \quad (4.14)$$

The probability that voter i votes for candidate a can thus be calculated as follows:

$$Pr(E_t[\mu_t^a] - \theta^i \geq 0) = E_t[\mu_t^a] + \frac{1}{2} - \nu \quad (4.15)$$

Voters are assumed to observe the deficit with a one period time lag. They thus cannot observe d but will form an estimate of it, $\hat{d}$. Their best guess of the government's competence shock in period t is thus:

$$E_t[\mu_t^a] = \hat{\mu}_t^a = f_t + g_t - \tau^* - \hat{d}_t - \mu_{t-1}^a \quad (4.16)$$

Substituting equation 4.7 into equation 4.13 yields

$$E_t[\mu_t^a] = \hat{\mu}_t^a = \mu_t^a + d_t - \hat{d}_t \quad (4.17)$$

From equations 4.15 and 4.17, the probability P that candidate a receives at least 50% of the votes can be expressed as

$$P_t = Pr(\mu_t^a + d_t - \hat{d}_t + \frac{1}{2} - \nu \geq \frac{1}{2}) = 1 - F(\hat{d}_t - d_t + \nu) \quad (4.18)$$

The government then maximises its expected utility for periods t and $t + 1$.

$$\begin{aligned} \max_d \quad & E_t[\gamma^a(\tau^* + d_t + \eta_t^a) + u(y - \tau^*) + X] \\ + \quad & E_t[(1 - F(\hat{d}_t - d_t + \nu)) \cdot (\gamma^a(\tau^* - R(d_t) + \eta_{t+1}^a) + u(y - \tau^*) + X)] \\ + \quad & E_t[F(\hat{d}_t - d_t + \nu) \cdot ((1 - \gamma^a)(\tau^* - R(d_t) + \eta_{t+1}^b) + u(y - \tau^*))] \end{aligned} \quad (4.19)$$

²⁷This equation is derived in the appendix.

The first order condition for this maximisation problem is:

$$\begin{aligned} & \gamma^a(1 - R'(d_t)) + f(\hat{d}_t - d_t + \nu)((2\gamma^a - 1)(\tau^* - R(d_t)) + X) \\ & + (2\gamma^a - 1)R'(d_t)F(\hat{d}_t - d_t + \nu) = 0 \end{aligned} \quad (4.20)$$

In equilibrium the incumbent's choice of the deficit d^* must be consistent with the voters' expectations. Thus in equilibrium $d^* = \hat{d}_t = d_t$. This means that voters fully understand the government's incentives and correctly anticipate any electoral changes in the deficit, conditional on the incentive structures resulting from polarisation and the challenger's advantage. Given the assumptions about the function F , the first order condition in equation 4.20 must hold in equilibrium:

$$\gamma^a(1 - R'(d^*)) + f(\nu)((2\gamma^a - 1)(\tau^* - R(d^*)) + X) + (2\gamma^a - 1)R'(d^*)F(\nu) = 0 \quad (4.21)$$

Differentiating the first order condition with respect to d^* and ν yields:

$$\frac{\partial d^*}{\partial \nu} = \frac{f'(\nu)((2\gamma^a - 1)(\tau^* - R(d^*)) + X) + f(\nu)(2\gamma^a - 1)R'(d^*)}{\gamma^a R''(d^*) + f(\nu)(2\gamma^a - 1)R''(d^*) - F(\nu)(2\gamma^a - 1)R''(d^*)} \quad (4.22)$$

For the special case of no polarisation, i.e. where $\gamma^a = \frac{1}{2}$, it holds that:

$$\frac{\partial d^*}{\partial \nu} \begin{cases} > 0, & \text{if } (\nu < 0) & \text{if } \gamma^a = \gamma^b = \frac{1}{2} \\ < 0, & \text{if } (\nu > 0) & \text{if } \gamma^a = \gamma^b = \frac{1}{2} \end{cases} \quad (4.23)$$

This means that when polarisation is zero, the relationship between government popularity and the deficit in election years is parabolic: as the challenger's advantage increases, the deficit increases until the point where the election is neck-on-neck. As the challenger's advantage increases beyond this point the deficit falls. The logic of this relationship is intuitive. If there is congruence in preferences over public goods, the contest in the election is purely over ego-rents. The incentive to increase the deficit in order to appear competent is largest when government competence would decide the election, i.e. when the electorate is evenly split between the two candidates. In this case, a positive competence shock would tip the balance toward electoral victory. As one of the two candidates gains an exogenous electoral advantage, the magnitude of the competence shock that would be necessary to decide the election increases. If the government has an electoral advantage, a negative competence shock large enough to make voters indifferent between the two candidates becomes

increasingly unlikely. On the other hand, as the challenger gains an advantage, the government is increasingly unlikely to experience a competence shock sufficiently large to make voters indifferent. Since borrowing is costly and decreases the government's expected future utility from public consumption disproportionately, the government's incentive to borrow before an election decreases. Since voters understand this incentive, governments will set the deficit in accordance with their expectations. In other words, voters are fully aware of the government's incentives that result from polarisation and its popularity. They expect the government to act on its incentives and therefore, policy and expectations converge. It should thus be noted that, in accordance with chapter 3, voting behaviour is not affected since voters expect the implemented policy. The implemented, yet fully expected, policy under low polarisation then is based on a parabolic relationship between the likelihood of re-election and the deficit.

If polarisation is greater than zero, this relationship changes. Polarisation always increases the equilibrium deficit, which can be shown by differentiating the first order condition with respect to d^* and γ^a :²⁸

$$\frac{\partial d^*}{\partial \gamma^a} = \frac{\gamma^a R''(d^*) + f(\nu)(2\gamma^a - 1)R'(d) - F(\nu)(2\gamma^a - 1)R''(d^*)}{1 - R'(d^*) + 2f(\nu)(\tau^* - R(d^*)) + 2F(\nu)R'(d^*)} > 0 \quad (4.24)$$

As polarisation exceeds zero, electoral competition is not only about ego-rents but also about the government's utility from public consumption. If the government loses the election, the challenger will provide its preferred public good, from which the ousted government derives less utility.

Since the service cost for public debt, $R(d)$, is a convex function, borrowing reduces future public consumption disproportionately. Polarisation, however, may offset this cost and may increase the overall expected utility from borrowing before elections: if the opponent wins the election and provides her preferred public good, the ousted incumbent will receive a lower stream of utility from public consumption as she would from her preferred public good. The expected difference in marginal utilities from public consumption before and after the election counterbalances the cost of borrowing. As polarisation increases, the incentive to borrow thus also increases - as is expected by the voters who accordingly do not change their voting behaviour. The effect on fiscal policy is enhanced by the likelihood of re-election. The more likely the government is to lose the election, the higher is the expected difference in marginal utilities from public consumption, the larger is the incentive to increase the deficit.

²⁸This prediction is commensurate with Alt and Lassen (2006b) *American Journal of Political Science* (as in n. 20); and with Alesina and Tabellini (1990) (as in n. 18).

Figure 4.1: Challenger advantage, polarisation, and the deficit

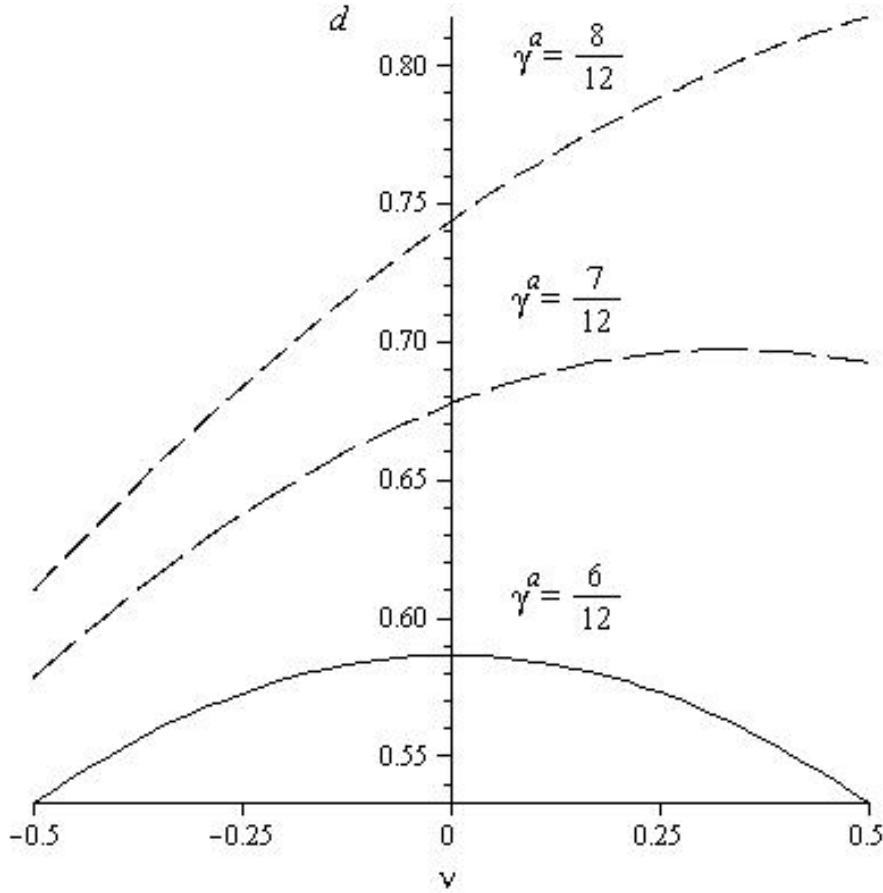


Figure 4.1 illustrates the effect of polarisation and the likelihood of re-election on the pre-electoral deficit. For zero polarisation, i.e. $\gamma^a = \frac{6}{12} = \frac{1}{2}$, indicated by the solid line, the relationship is parabolic. As polarisation increases, indicated by the dashed lines ($\gamma^a = \frac{7}{12}$ and $\gamma^a = \frac{8}{12}$), the equilibrium deficit increases, and the maximum value shifts to the right until it reaches the point where the relationship between the likelihood of re-election and the deficit becomes monotonically increasing. These empirical predictions are summarised by proposition 4.1:

Proposition 4.1. *Comparative statics of equilibrium pre-electoral deficit*

- If polarisation, $\gamma^a - \gamma^b$, is zero, the equilibrium deficit, d^* is at its maximum when the incumbent and opponent are equally likely to win the election, $v = 0$.*
- The equilibrium deficit, d^* , increases, as polarisation, $\gamma^a - \gamma^b$, increases.*
- The effect of the likelihood of losing the election, v , on the equilibrium deficit, d^* ,*

increases in the degree of polarisation, $\gamma^a - \gamma^b$.

The remainder of this chapter will test proposition 4.1. empirically.

4.4 Data

The dependent variable is the budget deficit, which is generally operationalised as the budget balance (where a negative balance represents a deficit). The empirical analysis will build on Brender and Drazen's measure of the budget balance, which they calculate as total central government revenue minus expenditure as a percentage of GDP.²⁹ Although their variable is not a perfect measure of the budget deficit, since it excludes other revenue sources than taxation, it is superior to other measures of the deficit for the purpose of this analysis. The OECD and the International Monetary Fund provide two operational contenders to the Brender and Drazen data. The problem with deficit data from the OECD is that they are only available for the years after 1980 and for some countries even later. The International Monetary Fund receives most of its data from the OECD and the problems are thus similar. The most compelling reason for using the Brender and Drazen data for the analysis is that they cover a significantly longer time period than OECD and IMF data – the period Brender and Drazen cover ranges from the years 1960 to 2001. Correlating Brender and Drazen's measure of the budget balance with the IMF's measure of the general government balance taken from the *2009 World Economic Outlook* returns a correlation coefficient of 0.9.³⁰ Their variable thus seems to be a good approximation of the budget balance.

The theoretical propositions that will be tested below, considers the linkage between the likelihood of electoral victory and government borrowing. How can a government assess its likelihood of electoral victory? The best indicator is arguably the percentage of people who would intend to vote for the government if there were a general election. Although an intention does not always translate into behaviour and therefore involves an extent of uncertainty, data about vote intention provide governments with a rough measure of electoral prospects. It is a relatively widely available measure. In virtually all OECD countries, the media publish vote intention data on a regular basis. Politicians thus have easy access to this information and are thus likely to use it when making policy choices.

²⁹Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

³⁰The IMF data will be used in chapters 5 and 6 where time series are only available for more recent periods.

There are different ways of measuring vote intention. In a related study for elections in the U.S. states, Alt and Rose look at the *lead* of one party over another in public opinion polls.³¹ This operationalisation works well in systems where competition is essentially between two parties, as in the case of the United States. For the majority of the countries included in the analysis for this chapter, multiple parties compete for office. In this case, it is difficult to distinguish between ‘the incumbent’ and ‘the challenger’ since there are multiple potential challengers. This is in particular an issue under multi-party government, where coalition members can also compete against one another. For this reason, the analysis below will employ an absolute measure of government support rather than a relative measure like the lead in public opinion.

Data on vote intention are gathered by a number of polling institutes. Complete time series data are available from the early 1970s for all member states of the European Union through the Eurobarometer. One drawback of this dataset is that data are only available for each country from the point when (or shortly before) it joined the EU.³² However, since it is difficult to obtain complete time series data from other sources, the Eurobarometer is the primary source for this study. For non-EU member states, data can be obtained from other sources. For Canada, Gallup provides complete time series on vote intention. These data can easily be combined with the Eurobarometer data because the question wording and the answering format are comparable.³³ Gallup also provides data on presidential approval in the United States. It should be noted that approval is not necessarily the same concept as vote intention but the two concepts are closely related.³⁴ The main underlying idea is that it provides the government with an indication of electoral victory and a government that people approve of should be more likely to win an election than a government that people do not approve of. The same argument applies to Japan, where the data reflect cabinet approval. These data were obtained from Matsumoto’s extensive compilation of cabinet approval data.³⁵

All data are based on surveys taken from representative national samples. The questions on vote intention/government approval allowed for a ‘don’t know’ answer. This should be borne in mind because fewer answers in favour of the government do not necessarily result from preferences for an opposition party but can stem from indifference. This should, however, not constitute a problem for this study because indifference increases electoral

³¹Alt and Rose (2007) (as in n. 14).

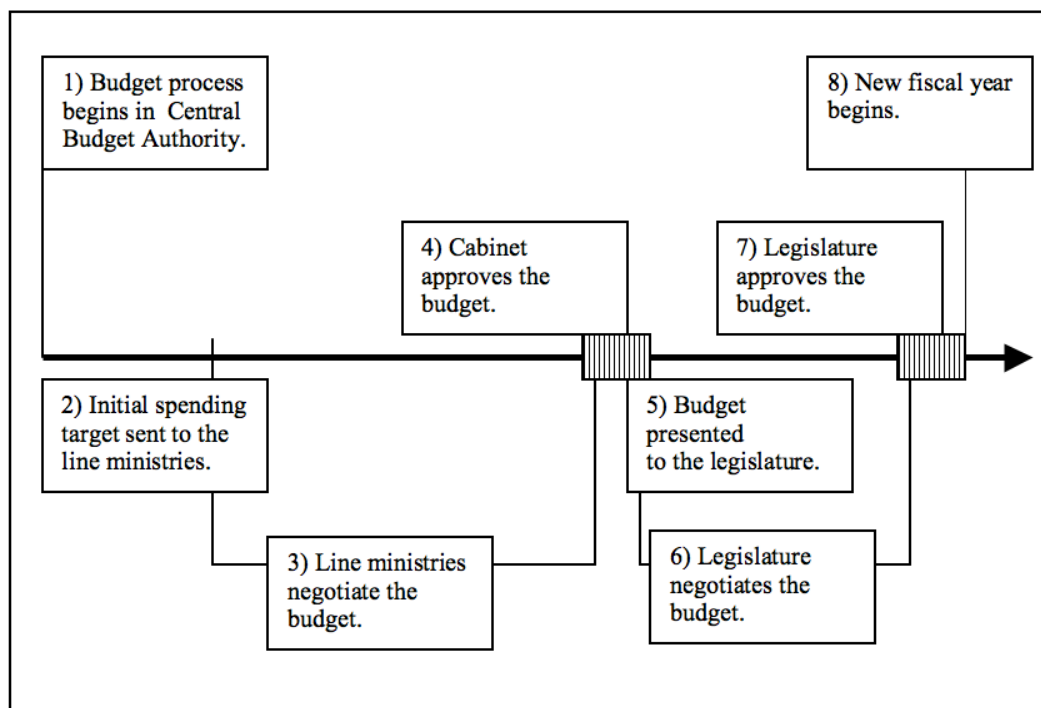
³²It should be noted that for Sweden and Finland, time series are too short to be included in the analysis.

³³The question reads: If there were a general election held tomorrow, which party would you vote for?

³⁴Pickup, Mark and Johnston, Richard (2007) Campaign Trial Heats as Electoral Information: Evidence from the 2004 and 2006 Canadian Federal Elections, *Electoral Studies*, Vol. 26, No. 2.

³⁵Matsumoto, Masao (2001) *Seiji Ishiki Zuzetsu [Mapping Political Opinions]*, Tokyo: Chukou Shinsho.

Figure 4.2: Schematic time-line of the budget process in OECD countries



Note: This figure is an adaptation of Organisation for Economic Cooperation and Development (OECD) (2007).

uncertainty and therefore similarly decreases the likelihood of electoral victory.

It is important to decide the time point at which vote intention will affect the government's decision to borrow. The budget process can be cumbersome and in some countries it can last longer than a year. It is important to investigate the moment when the government is likely to include strategic policies into the budget. The OECD conducts elite surveys to provide insights into national budget processes. Figure 4.2 reproduces a schematic time-line of the budget process, based on an illustration provided by the OECD.³⁶

Figure 4.2 illustrates that the budget process for a fiscal year generally begins with the Central Budget Authority (which is usually the Ministry of Finance). In the US, this happens about 20 months before the fiscal year begins. In other countries, the process begins significantly later. For example, in Belgium, Greece, and Italy, the Central Budget Authority takes up its work only nine months before the fiscal year begins. Strategic decisions about deficits are more likely to occur when the budget proposals leave the technocratic Central Budget Authority and reach the ministries. Once the cabinet passed the budget, it is then sent to the legislature, which has to give its consent to it before coming into effect.

³⁶Organisation for Economic Cooperation and Development (OECD) (2007) OECD Budget Practices and Procedures Database, (URL: <http://www.oecd.org/gov/budget/database>) – visited on November 3, 2009.

Strategic considerations on borrowing before elections will have to be made during that period when the budget is prepared in the ministries. This is thus the period during which governments will closely follow public opinion in order to evaluate whether they should borrow strategically or not. In order to operationalise the vote intention variable, data have been collected for this period. In the case of the Eurobarometer, data could be collected for either spring or autumn, where the surveys for the spring data were generally administered in March and April and for the autumn data in September and October. For Canada, Japan, and the United States, these surveys were administered on a monthly basis. Table 4.1 in the appendix lists the time period when the budget is generally debated in the ministries and the data period it was matched with for the data analysis. Where the two periods do not overlap, the data of the earlier period were chosen in order to avoid measuring the public's reaction to the budget. Generally, spring data were used for the first six months of the year and autumn data were used for the second half of the year.³⁷

For all countries in this study, the vote intention variable reflects public opinion in the spring or autumn of the previous calendar year, the variable thus has been lagged by one period. It should be noted that this specific lag structure potentially allows for insights into causality.³⁸ Since the government incorporates its popular approval into its strategies before the budget is enacted, and since budget deliberations essentially take place behind closed doors, public approval cannot be the consequence of the change in the deficit in the following fiscal year - but it can be the cause. This reduces the likelihood of endogeneity in the estimation. It should be noted that in most OECD countries, governments are relatively flexible with borrowing and can amend the budget during the year. Thus, the robustness of the results will be tested using the spring data. Using only the spring data in election years is reasonable to ensure that the values reflect government popularity *before* the election.

The effect of vote intention on political budget cycles will be tested as an interaction with election years, since the theory only relates to deficit spending in election years. To this

³⁷A potential problem is that these data were collected in the year 2006. There is not much information about the general length of budget negotiations and the information at hand may not be stable over time. To investigate to which extent the length of budget negotiations is likely to be structural rather than temporary, a simple poisson regression was conducted, regressing the length of the budget process from step 1 to step 7 in figure 2.3, on a number of independent variables. The most likely factors for temporal instability of the length of budget negotiations are a party's ideology, which changes with the government in power, and whether the year in which the data were collected was an election year. Neither of these influences has a significant effect in this regression. Significant predictors included the degree of checks and balances, whether the country was anglophone or not, and the power of parliament over the executive. These factors tend to be stable over time which provides justification for using information on the length of budget negotiations for preceeding years.

³⁸This lag structure loosely compares to an analysis by Ellis and Thoma. They do not find a strong support of presidential approval for political business cycles in the US; Ellis, Christopher J. and Thoma, Mark A. (1991) Causality in Political Business Cycles, *Contemporary Policy Issues*, Vol. 9. It also compares to work by Soroka and Wlezien and their work on public opinion and public policy. Soroka and Wlezien (2005) *British Journal of Political Science* (as in n. 9); Wlezien and Soroka (2007) (as in n. 9).

end, as in chapter 3, an election year dummy was retrieved from the Brender and Drazen dataset, which takes a value of 0 for non-election years and a value of 1 in election years.

Polarisation, another key factor in the presented theory, was derived from data provided by the *Comparative Manifesto Project*.³⁹ The CMP data are based on a content analysis of party manifestos and, amongst others, contain a measure of the salience each party with legislative representation attaches to policy issues on a left-right scale. This left-right scale encompasses a large array of factors as diverse as, for example, attitudes toward political authority, free trade, military spending, and welfare policies. The measure thus does not just capture preferences over different levels of taxation but rather preferences over different public policies. For example, a party would be coded as left (right) wing if it advocated less (more) military spending and more (less) spending on social welfare. Since the theoretical model specifies preferences over the composition of public expenditure rather than the level of public expenditure, this measure provides a suitable operationalisation. Given this left-right scale, polarisation is then calculated as the standard deviation of the parties' policy scores in each legislature during the electoral term. The measure is weighted by the seat share, to account for different degrees of influence over policies depending on the size of a party. The sample will be split into a 'high' and a 'low' polarisation sample. Polarisation mainly varies across countries rather than time, which is why the countries are split in roughly evenly sized samples based on their median polarisation value.

There are a number of control variables that will be included. The selection of these variables follows similar analyses of political budget cycles, in particular that of Brender and Drazen whose dataset will be used.⁴⁰ Accordingly, controls will include a measure of economy size, *LnGDP*, which is operationalised as the log of GDP per capita; a measure of the output gap, *Output gap*, which indicates the economy's divergence from its growth pattern, which is estimated using the Hodrick-Pescott filter; the trade balance, *Trade*, and the ratio of the population of working age over dependents (i.e. children and pensioners), *WorkPop*. These data were all taken directly from Brender and Drazen's dataset. The polarisation measure, *Polarisation*, was mainly constructed to show that polarisation conditions the functional form of the relationship between government popularity and strategic debt. Since it is such a key variable, it will also be included in the estimation, together with the ideology index, *Left-Right*, it is based on. Descriptive statistics of all used data are provided in table 4.2 in the appendix.

³⁹Budge, Ian et al. (2001) *Mapping Policy Preferences: Estimates for Parties, Electors, and Governments*, Oxford: Oxford University Press.

⁴⁰Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 29).

4.5 Estimation

The propositions will be tested in a pooled time series-cross section analysis. The sample will be split in two where one part represents low polarisation and the other high polarisation. For low polarisation the impact of government popularity on the budget balance is expected to be non-linear. The regression equation can be expressed as:

$$\begin{aligned}
 F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 VOTE_{i,t} \\
 & + \beta_4 ELECT_{i,t} * VOTE_{i,t} + \beta_5 VOTE_{i,t}^2 \\
 & + \beta_6 ELECT_{i,t} * VOTE_{i,t}^2 + \gamma' \mathbf{X}_{i,t} + \eta_i + \nu_{i,t}
 \end{aligned} \tag{4.25}$$

For high polarisation the effect is expected to be linear:

$$\begin{aligned}
 F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 VOTE_{i,t} \\
 & + \beta_4 ELECT_{i,t} * VOTE_{i,t} + \gamma' \mathbf{X}_{i,t} + \eta_i + \nu_{i,t}
 \end{aligned} \tag{4.26}$$

where for both equations $i = 1, 2, \dots, N$ and $t = 1, \dots, T$. $F_{i,t}$ is the indicator of fiscal policy, which in this case is the budget balance. This means that *negative* values of the dependent variable indicate a budget deficit. $ELECT$ is a dummy variable indicating whether an election took place in year t . $VOTE$ represents the government's popularity and $VOTE^2$ is the squared term which captures possible non-linearities. The β 's represent the coefficients to be estimated. For the linear model, it is expected that the coefficient for the election dummy and the coefficient for the interaction term with the $VOTE$ measure will be statistically significant; for the non-linear model it will additionally be expected that the interaction effect between the election dummy and the squared $VOTE$ variable will be significant.

Apart from these main variables of interest the statistical model will include a lagged dependent variable, $F_{i,t-1}$ to model the underlying dynamics of the dependent variable. The matrix $\mathbf{X}_{i,t}$ contains control variables and the vector γ contains the associated coefficients. that have been included in similar studies in the literature. The parameter η_i is the country specific error terms while $\nu_{i,t}$ indicates the model's overall error. A standard estimation procedure would be to account for unit heterogeneity through fixed effects (FE), i.e. by

mean-differencing the data - or similarly, by including country dummies, which is known as Least Squares Dummy Variable (LSDV) estimation. However, in the presence of a lagged dependent variable, FE can result in serious bias, as pointed out by Nickell.⁴¹ This is a general problem with this type of time series-cross sectional models and will concern all empirical estimation in subsequent studies.

One way of overcoming this problem is using an estimator based on the General Method of Moments (GMM) as proposed by Arellano and Bond.⁴² This procedure has been used widely in similar studies and will be used in the following two chapters. However, the procedure was developed for cases where the number of observations is large and the number of time periods is small. The analysis in this chapter, however, only includes 16 countries, and this sample will be split in two, resulting in as few as 7 units for the estimation. Time series, on the other hand, are relatively long, spanning up to 30 years. GMM techniques will correct for the bias and thus lead to consistent results; however, when N is small and T is large, the LSDV results will be more efficient.⁴³ There is thus a trade-off between consistency and efficiency.

Kiviet and Bun aim to minimise this trade-off by correcting for the bias induced by LSDV estimation.⁴⁴ They propose to derive the magnitude of the bias from a consistent estimator, e.g. derived from GMM estimation, and then account for it in the LSDV estimates. Judson and Owen conduct Monte Carlo experiments and that the bias-corrected LSDV (LSDVC) estimator performs better given this data structure than other commonly used estimators.⁴⁵ Although theoretically attractive, the LSDVC estimator only had limited practical use until recently because it had not been derived for unbalanced samples - such in this chapter. Bruno adjusts the estimator for an unbalanced panel format.⁴⁶ This will thus be the estimator chosen for the analysis below.

The estimator will be based on the consistent estimates derived from Arellano and Bond's

⁴¹Nickell, Stephen J. (1981) Biases in Dynamic Models with Fixed Effects, *Econometrica: Journal of the Econometric Society*, Vol. 49, No. 6.

⁴²Arellano, Manuel and Bond, Stephen (1991) Some Tests of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, Vol. 58, No. 2; see also Blundell, Richard and Bond, Stephen (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 87, No. 1.

⁴³Arellano and Bond (1991) (as in n. 42); Kiviet, Jan F. (1995) On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 68, No. 1; Judson, Ruth A. and Owen, Ann L. (1999) Estimating Dynamic Panel Data Models: A Guide for Macroeconomists, *Economics Letters*, Vol. 65, No. 1.

⁴⁴Kiviet (1995) (as in n. 43); Bun, M.J.G. and Kiviet, J.F. (2003) On the Diminishing Returns of Higher-Order Terms in Asymptotic Expansions of Bias, *Economics Letters*, Vol. 79, No. 2.

⁴⁵Judson and Owen (1999) (as in n. 43).

⁴⁶Bruno, Giovanni S.F. (2005a) Approximating the Bias of the LSDV Estimator for Dynamic Unbalanced Panel Data Models, *Economics Letters*, Vol. 87, No. 3; Bruno, Giovanni S.F. (2005b) Estimation and Inference in Dynamic Unbalanced Panel-Data Models with a Small Number of Individuals, *Stata Journal*, Vol. 5, No. 4.

difference GMM, which will be discussed in more detail in the next two chapters.⁴⁷ The estimator employed allows for bias correction up to order $N^{-1}T^{-2}$. Standard errors are calculated through bootstrapping. If consistent, the estimate for the coefficient of the lagged dependent variable will lie between the estimates from a pooled regression and FE estimation. Accordingly, Bond recommends presenting the results from all three estimation methods.⁴⁸ The tables below follow his advice.

4.6 Results

Before splitting the sample to test proposition 4.1, it is sensible to look at the effect of popularity on the budget balance in the whole sample. Table 4.1 presents the estimation results for all 16 countries available for this analysis. The first three columns do not contain any interaction terms. They serve to examine the effect of the election dummy on its own and to examine the specification of the LSDVC model. Column one contains estimated effects for the pooled model, column two for the FE model, and column three for the LSDVC model.⁴⁹ The election dummy is negatively signed in all three models, which is in line with expectations: the budget balance decreases in election years. This thus captures the political budget cycle in OECD countries. This effect is only significant in the LSDVC model, at the 5% level. The LSDVC model seems to be correctly specified. The estimated coefficient for the lagged dependent variable in the pooled model is 0.87, and for the FE model it is 0.73. As required for a consistent estimator, the LSDVC estimate of 0.81 lies right in between these two values. This lends credibility to the LSDVC estimates.

Columns four and five of table 4.1 include the interaction terms. There is no sign of any significant relationships in either of the two columns: the interaction effect for the linear model in column four is correctly signed but insignificant with a standard error of roughly the same magnitude as the coefficient estimate. For the non-linear model in column five none of the interaction effects are even close to conventional values of statistical significance. If proposition 4.1 is correct, this should change when the sample is split to separate countries with low polarisation from those with high polarisation.

Table 4.2 reports the estimation results for the same analysis as in table 4.1, yet it only includes countries where polarisation is low. Again, columns one through three present the

⁴⁷ Arellano and Bond (1991) (as in n. 42).

⁴⁸ Bond, Stephen R. (2002) *Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice*, *Portuguese Economic Journal*, Vol. 1, No. 2.

⁴⁹ Robust standard errors were calculated for the pooled and FE model to account for heteroskedasticity and remaining autocorrelation.

Table 4.1: Regression results: full sample

Dep. variable	Budget balance				
Model	(1)	(2)	(3)	(4)	(5)
Method	Pooled	FE	LSDVC	LSDVC	LSDVC
Sample	All				
Balance (L1)	0.87*** (0.03)	0.73*** (0.05)	0.81*** (0.05)	0.81*** (0.05)	0.81*** (0.05)
LnGDP	1.03*** (0.25)	0.86* (0.44)	0.74* (0.53)	0.75* (0.05)	0.75* (0.05)
Output gap	0.17** (0.07)	0.30* (0.16)	0.18 (0.26)	0.19 (0.26)	0.21 (0.26)
Polarisation	0.01 (0.03)	-0.04 (0.04)	-0.03 (0.15)	-0.03 (0.03)	-0.02 (0.03)
Left-Right	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Trade	0.00 (0.00)	0.01 (0.01)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
WorkPop	0.00 (0.05)	0.03 (0.08)	0.05 (0.12)	0.05 (0.12)	0.03 (0.12)
Elect	-0.20 (0.19)	-0.30 (0.21)	-0.29** (0.15)	-1.04* (0.60)	-0.66 (1.34)
Vote	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.04 (0.04)
Vote x Elect				0.02 (0.02)	0.00 (0.07)
Vote ²					0.00 (0.00)
Vote ² x Elect					0.000 (0.000)
Observations	334	334	334	334	334
Number of countries	16	16	16	16	16

Constant not reported. Standard errors in parentheses:

pooled and FE: robust; LSDVC: bootstrapped

*** p<0.01, ** p<0.05, * p<0.1

empty model without any interaction terms. As expected, the election term is negatively signed. However, it is insignificant across specifications. This is not surprising given that the sample only includes what Brender and Drazen term ‘old’ democracies.⁵⁰ Turning to the specification of the model, the LSDVC estimator performs well again. The estimate for the coefficient of the lagged dependent variable of 0.84 lies in between the estimates from the pooled (0.89) and FE model (0.77) respectively, suggesting that the model is correctly specified.

Column four includes the linear interaction. As expected for the low-polarisation sample, this interaction is insignificant: there is no linear relationship between vote intention and the budget deficit in election years when polarisation is low. Column five includes the squared term and the interaction with the election dummy. As expected, the election dummy,

⁵⁰Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 29).

Table 4.2: Regression results: low polarisation

Dep. variable	Budget balance				
Model	(1)	(2)	(3)	(4)	(5)
Method	Pooled	FE	LSDVC	LSDVC	LSDVC
Sample	Low polarisation				
Balance (L1)	0.89*** (0.05)	0.77*** (0.06)	0.84*** (0.08)	0.84*** (0.08)	0.84*** (0.08)
LnGDP	2.09*** (0.47)	1.77*** (0.46)	1.50*** (0.51)	1.50*** (0.51)	1.44*** (0.51)
Output gap	0.09 (0.11)	0.04 (0.17)	-0.10 (0.31)	-0.12 (0.31)	-0.09 (0.31)
Polarisation	0.10 (0.07)	0.02 (0.06)	0.04 (0.07)	0.04 (0.07)	0.05 (0.07)
Left-Right	-0.01 (0.02)	-0.02 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.00 (0.03)
Trade	0.00 (0.00)	0.01 (0.01)	0.01 (0.02)	0.01 (0.02)	0.02 (0.02)
WorkPop	-0.05 (0.07)	0.05 (0.14)	0.03 (0.15)	0.03 (0.16)	0.02 (0.16)
Elect	-0.16 (0.31)	-0.11 (0.27)	-0.08 (0.31)	0.72 (1.14)	5.42* (2.89)
Vote	-0.04** (0.02)	0.03 (0.02)	-0.02 (0.02)	-0.02 (0.03)	0.16 (0.12)
Vote x Elect				0.02 (0.03)	-0.26** (0.13)
Vote ²					0.00 (0.00)
Vote ² x Elect					0.003** (0.001)
Observations	131	131	131	131	131
Number of countries	7	7	7	7	7

Constant not reported. Standard errors in parentheses:

pooled and FE: robust; LSDVC: bootstrapped

*** p<0.01, ** p<0.05, * p<0.1

and the interactions with both functional forms of the popularity measure are statistically significant. This provides support for proposition 4.1a): when polarisation is low, the effect of government popularity on the budget balance is parabolic. However, it should be noted, that the joint effect on the budget balance does not reach conventional levels of statistical significance. This weakens the results but they are not surprising given the insignificant election dummy in columns one to three. The magnitude of political budget cycles in the countries included in table 4.2 is small (at best), which means that it is difficult to detect subtle underlying relationships. However, the statistical significance of the key coefficients does provide some weak support for proposition 4.1a) under low popularity.

Table 4.3 turns to the sample of countries with high polarisation. Again, columns one through three present the results from different estimation methods without the interaction

Table 4.3: Regression results: high polarisation

Dep. variable	Budget balance				
Model	(1)	(2)	(3)	(4)	(5)
Method	Pooled	FE	LSDVC	LSDVC	LSDVC
Sample	High polarisation				
Balance (L1)	0.80*** (0.04)	0.64*** (0.08)	0.74*** (0.06)	0.74*** (0.06)	0.74*** (0.06)
LnGDP	0.61* (0.33)	0.23 (0.37)	0.19 (0.43)	0.25 (0.44)	0.27 (0.43)
Output gap	0.34* (0.20)	1.10*** (0.21)	0.87*** (0.23)	0.88*** (0.23)	0.89*** (0.24)
Polarisation	-0.06* (0.04)	-0.03 (0.03)	-0.03 (0.06)	-0.02 (0.06)	-0.02 (0.06)
Left-Right	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.02)
Trade	0.00 (0.00)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
WorkPop	-0.09 (0.08)	-0.02 (0.12)	0.04 (0.02)	0.04 (0.14)	0.03 (0.13)
Elect	-0.38 (0.24)	-0.37 (0.30)	-0.38*** (0.01)	-1.41*** (0.52)	-1.42 (1.31)
Vote	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.02)	-0.01 (0.04)
Vote x Elect				0.03** (0.01)	0.03 (0.07)
Vote ²					0.00 (0.00)
Vote ² x Elect					0.00 (0.00)
Observations	203	203	203	203	203
Number of countries	9	9	9	9	9

Constant not reported. Standard errors in parentheses:

pooled and FE: robust; LSDVC: bootstrapped

*** p<0.01, ** p<0.05, * p<0.1

term. In these countries the election term is negatively signed and statistically significant, at least for the LSDVC model in column three. The magnitude of the coefficient is considerably larger than the one reported in table 4.2 for low polarisation. This is not surprising given earlier results that political budget cycles are more pronounced under high polarisation.⁵¹ It is also in line with proposition 4.1b): the equilibrium deficit increases as polarisation increases. However, a simple t-test shows that this difference between the coefficients is not statistically significant since it narrowly misses the minimum conventional 10% threshold of statistical significance. This disappointing finding upholds if the election dummy is interacted with the interval polarisation measure in the full sample (not shown in the tables). The weakness of the effect is likely to be due to the relatively small sample size. Yet support for proposition 4.1b) is feeble at best.

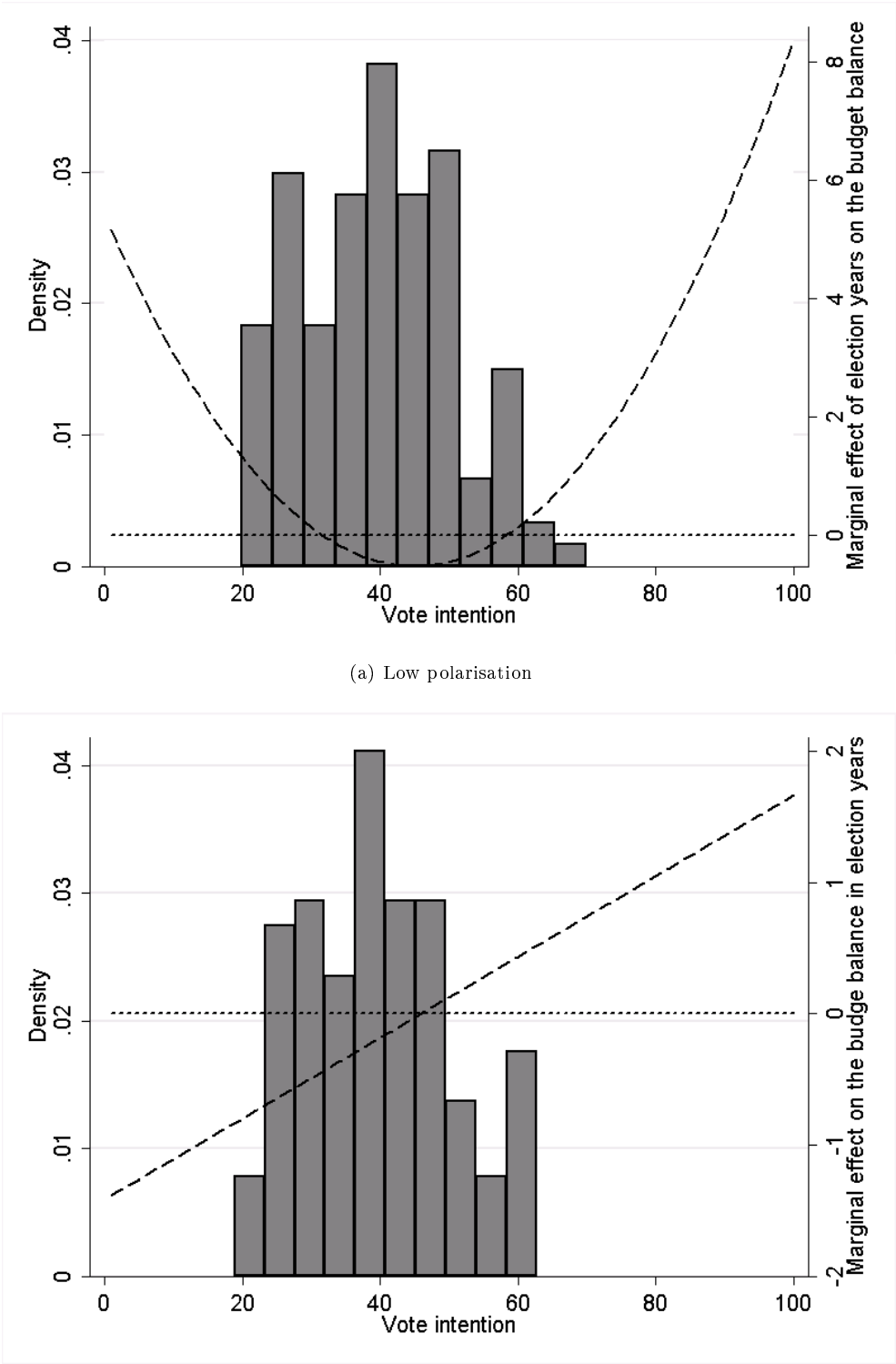
⁵¹Alt and Lassen (2006b) *American Journal of Political Science* (as in n. 20).

Looking at specification issues, the estimate for the lagged dependent variable of 0.74 lies in between the estimates from the pooled model (0.8) and the FE model (0.64), again suggesting that the LSDVC estimator is consistent. Column four includes the linear interaction term. The results conform with expectations: the election dummy is negatively signed and significant (at the 1% level) whilst the interaction effect is positive and also statistically significant (at the 5% level). This suggests that the magnitude of the political budget cycle increases as government popularity falls, thus providing support for proposition 4.1c). It should be noted that the joint effect of the popularity measure in election year is significant for almost half of the observations in the sample. This strengthens the evidence further. Lastly, none of the interaction effects in column five are significant, suggesting that the effect of government popularity on the budget balance is indeed linear. Proposition 4.1c) is thus borne out well by the data and is thus the strongest out of the three relationships tested.

Figures 4.3a) and b) plot the estimated effects of vote intention on the budget balance for the low polarisation and high polarisation samples respectively. The graphs are plotted over histograms of the vote intention variable. The dashed line is the effect of government popularity on the budget balance in election years. Figure 4.3a) shows that the effect is parabolic, as predicted by proposition 4.1a). The effect appears to be negative, at least for the mean values of the popularity variable. Yet it should be borne in mind that the overall effect on the budget balance is not significant. The estimated functional form thus provides support for proposition 4.1a) but this support is rather weak. Figure 4.3b) is analogous to figure 4.3a) but plots the estimated effect for high polarisation countries. The effect is linear and negative for the majority of observations - for about half of the observations of the sample this effect is statistically significant. Proposition 4.1c) thus receives relatively strong support from the data.

Several tests were carried out to test the robustness of these results. For one, different countries were excluded from the analysis or interchanged between samples. This procedure always weakened the findings which lends more credibility to the findings. The analysis was also replicated with vote intention data from the spring in year t , i.e. unlagged. The problem is that this approach introduces the potential for endogeneity since deficits may influence the vote choice. The results are similar to the one reported above, however, the non-linear effect is significantly weakened. Lastly, control variables, which tend to be statistically insignificant in most of the specifications in the three tables were removed. Removing these controls also results in weaker results, which is why these controls are included in the tables.

Figure 4.3: Marginal effects of government popularity on the budget balance



Chapter 9 includes all variables this thesis shows as determinants of political budget cycles in one comprehensive model and, again, shows that the results from this chapter are unstable. Overall, it must be pointed out that the results are relatively weak. This may largely be caused by the small sample size. Measurement error in the vote intention variable may be another important reason for the relative weakness of the results.

4.7 Conclusion

This chapter set out to explore the impact of government popularity on the incumbent's incentives to increase budget deficits before elections. It started from the premise that politicians can be both office-seeking and policy-seeking. Polarisation, i.e. differences in policy platforms, increases the relevance of the policy-seeking element. The analysis shows that when polarisation is low, governments are mainly concerned with securing ego-rents, i.e. the gains from holding office. The closer the election outcome is anticipated to be, the more likely it is that strategic deficits will decide the election outcome. Thus, under low polarisation, the deficit increases as the race between the incumbent and the challenger gets closer. When polarisation is high, governments have an incentive to borrow in order to spend on policies they deem important and leave the financing to the future government. In polarised systems governments therefore increase the deficit the less likely they are to win the election.

The chapter has two key implications. First, it has shown that different models of strategic deficits complement each other. The model presented in this chapter combines insights from both a competence model and a model emphasising future constraints, as illustrated in chapter 2. The incentive to borrow to feign competence is largest when elections are close. The incentive to constrain the future incumbent is largest when the election seems lost. Polarisation is the mediating factor between the effects predicted by the two models.

Secondly, although the empirical results could be stronger, the model is able to at least partly explain variation in the relationship between government popularity and strategic debt across different countries. The study is ambitious since it estimates the relationship across countries. This has hitherto been unattempted in the literature which may have several reasons. For one, it is difficult to obtain government popularity data. Moreover, there are many sources for public opinion polls and their estimates differ considerably at times. It is not clear which sources governments rely on, and their popularity estimates may thus differ considerably from the ones employed in the analysis. Moreover, differences across

electoral systems result in different thresholds for electoral victory; and they may also bring about multiple ‘winners’ who will then form a coalition government. Coalition government is a particular problem because individual coalition members may correspond differently to popularity shocks.⁵² These factors may jointly explain why the empirical results are rather weak. However, the fact that in spite of these potential problems the evidence provides at least some support is notable.

⁵²For a treatment of political budget cycles under coalition government, see chapters 7 and 8 of this thesis.

4.8 Appendix

4.8.1 Theoretical

1) Optimal tax rate

The government's maximisation problem from equations 4.6 and 4.7 can be re-stated as:

$$\max_{\tau} \quad E_t[f_t^j + g_t^j + u(c_t) + X] \quad (\text{A-4.1})$$

$$s.t. \quad f_t + g_t = \gamma^j(\tau_t + \eta_t^j) \quad (\text{A-4.2})$$

The first order condition for is:

$$\begin{aligned} \frac{\partial g_t^j}{\partial \tau} + \frac{\partial u(c_t)}{\partial \tau} &= \frac{\partial \gamma^j(\tau_t + \eta_t)}{\partial \tau} + \frac{\partial u(y - \tau_t)}{\partial \tau} = \gamma^j - u_c(y - \tau_t) = 0 \\ \rightarrow \gamma^j &= u_c(y - \tau_t) \quad \rightarrow u_c^{-1}(\gamma^j) = y - \tau_t \\ \rightarrow \tau_t &= \tau^* = y - u_c^{-1}(\gamma^j) = y - u_c^{-1}(\gamma^a) = y - u_c^{-1}(1 - \gamma^b) \end{aligned} \quad (\text{A-4.3})$$

2) Election condition

Deriving equation 4.12, the government will be returned to office if voter i's expected utility from seeing candidate a in office in period $t + 1$ is greater than from candidate b

$$E_t[\frac{1}{2}f_{t+1}^a + \frac{1}{2}g_{t+1}^a + u(c_{t+1}) + \theta^i z^a] - E_t[\frac{1}{2}f_{t+1}^b + \frac{1}{2}g_{t+1}^b + u(c_{t+1}) + \theta^i z^b] \geq 0 \quad (\text{A-4.4})$$

Voters know the equilibrium tax rate τ^* and they also know that the equilibrium deficit in off-election years is zero. Moreover, voters expectation of the incumbent's competence in period $t + 1$ is $E[\eta_{t+1}^a] = \mu_t^a + E[\mu_{t+1}^a] = \mu_t^a$. Given the distributional assumptions about μ , the expected competence for candidate b is zero. Recalling that $z = -\frac{1}{2}$ for candidate a and $z = \frac{1}{2}$ for candidate b yields:

$$\begin{aligned} &E_t[\tau^* + \mu_t^a + u(c_t) + (-\frac{1}{2}\theta^i)] - E_t[\tau^* + u(c_t) + (\frac{1}{2}\theta^i)] \\ &= E_t[\mu_t^a] - \theta^i \geq 0 \end{aligned} \quad (\text{A-4.5})$$

4.8.2 Empirical

Table 4.1: Time line for the budget procedure

Country	Negotiations with line ministries end	Data Period	Data Source	Sample
Austria	August/September	Autumn	Eurobarometer	Low
Belgium	August/September	Autumn	Eurobarometer	Low
Canada	February	February	Gallup	High
Denmark	July	Autumn	Eurobarometer	High
France	August	Autumn	Eurobarometer	High
Germany	June	Spring	Eurobarometer	High
Greece	September/October	Autumn	Eurobarometer	High
Ireland	November	Autumn	Eurobarometer	Low
Italy	September	Autumn	Eurobarometer	Low
Japan	January	January	Matsumoto (2001)	Low
Luxembourg	June-September	Spring	Eurobarometer	Low
Netherlands	August	Autumn	Eurobarometer	High
Portugal	June	Spring	Eurobarometer	Low
Spain	June	Spring	Eurobarometer	High
UK	September-April	Spring	Eurobarometer	High
USA	January/February	February	Gallup	High

Notes: The time line data were obtained from the OECD. The OECD reports these data for fiscal years. They thus had to be adjusted to calendar years, as reported in the table. (1) The Eurobarometer surveys were administered during March and April in the spring and during September and October in autumn. (2) In Ireland, the budget procedure is more fluid. The government can make several amendments to the budget during the fiscal year and it is only approved by parliament toward the end of the fiscal year. The choice of the autumn data is a conservative approach to avoid interactive effects between the budget balance and popularity.

Table 4.2: Descriptive statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	334	-3.57	-3.00	4.10	-15.75	7.59
LnGDP	334	9.52	9.54	0.45	8.14	10.50
Output gap	334	2.82	2.51	1.26	0.80	9.41
Polarisation	334	4.60	3.71	3.24	0.73	18.74
Left-Right	334	0.08	-1.29	9.67	-20.44	19.79
Trade	334	72.53	54.27	27.72	15.92	226.07
WorkPop	334	66.27	66.61	2.31	57.77	69.89
Elect	334	0.28	0	0.45	0	1
Vote	334	35.72	35.57	11.16	7.80	70

Chapter 5

Sovereign Risk

5.1 Introduction

During the years 2007-2010, public finance has been the source of a stream of bad news and sinister forecasts. In February 2010, *The Economist* wrote in its lead article: “Last year it was banks; this year it is countries. The economic crisis, which seemed to have eased off in the latter part of 2009, is once again in full swing as the threat of sovereign default looms.”¹ In the past, sovereign default has largely been associated with developing countries, in particular in Latin America. With the current economic crisis it has also engulfed the developed world, prompting the German chancellor, Angela Merkel, to reiterate: “There is a rumor going around that states cannot go bankrupt. This rumor is not true.”²

Although states cannot go bankrupt in a legal sense, they may become insolvent when they fail to muster the resources required to service their debt obligations, resulting in default. The consequences are devastating for the economy. In fact, the mere likelihood of a sovereign default has economic repercussions. Brooks *et al.* find that downgradings of sovereign debt have negative effects on domestic stock markets as well as the strength of the local currency.³ Indeed, sterling dropped significantly in 2009, when several sovereign rating agencies considered downgrading British gilts;⁴ the Euro took a strong hit, affecting all sixteen member states of the eurozone, when Greek sovereign default became increasingly likely.⁵ These currency movements reflect changes in the attractiveness of investing in government bonds. The riskier the stock, the higher the premium that investors will demand for it. Sovereign risk is thus directly related to the cost of public debt - and consequently to the cost of strategic borrowing. In this light, this chapter addresses a timely question: how does the cost of public debt affect governments’ incentives to engage in manipulative policies that result in political budget cycles?

At first sight, sovereign risk, i.e. the likelihood of a government defaulting on its debt obligations, and thus the cost of public debt might not have any effect on strategic borrowing. Japan is the most indebted OECD member state with public debt close to 220% of GDP, up by 21% since the onset of the financial crisis in 2007.⁶ Yet in July 2009, only months before a general election to the *Kokkai*, the ruling Democratic Party of Japan (DPJ) pledged a monthly allowance of ¥26,000 for every child of junior high school age, the scrapping of fees

¹The Economist (2010a) New Dangers for the World Economy, 13 February.

²Der Spiegel (Online) (2009a) Can Countries Really Go Bankrupt? 30 January (URL: <http://www.spiegel.de/international/world/0,1518,604523,00.html>).

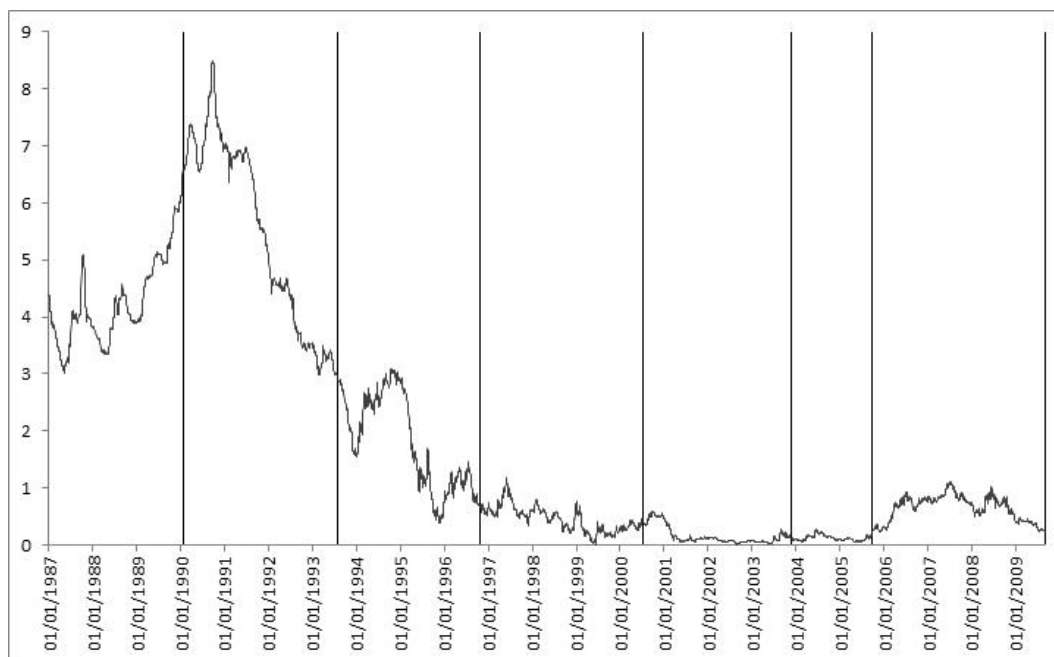
³Brooks, Robert et al. (2004) The National Market Impact of Sovereign Rating Changes, *Journal of Banking and Finance*, Vol. 28, No. 1.

⁴Garnham, Peter (2009) Sterling Falls on Debt Concerns, *The Financial Times* 9 December.

⁵Garnham, Peter (2010) Euro Under Pressure, *The Financial Times* 15 February.

⁶C/f figure 1.2 in chapter 1.

Figure 5.1: CDS Yields and elections in Japan



Note: Data obtained from Thomas Reuters's *Datastream*.

for high school, and free rides on motorways. ‘Big promises, but where’s the funds?’, titled *The Japan Times* in response to these announcements.⁷ The DPJ’s answer was essentially by ‘slashing waste’, in other words by increasing administrative efficiency. This anecdote exhibits strong parallels with competence models of political budget cycles: governments increase expenditure before an election in order to appear competent. The DPJ forecasted that ‘slashing waste’ would free up ¥6.1 trillion (roughly 1.2% of GDP). Yet, given the proximity to an election, this sum could also be financed with public debt, as predicted by the moral hazard model of political budget cycles.

The degree to which the government will have an incentive to borrow in order to finance pre-election expenditure boosts is likely to depend on the cost of public debt. Figure 5.1 plots the bid yield on two-year credit default swaps (CDS) with respect to Japanese sovereign debt.⁸ CDS are essentially an insurance against default. The graph thus provides an indication of the market’s assessment of Japanese default risk which will translate into the cost of borrowing. The vertical lines represent election years. Clearly, the assessment of sovereign risk has varied substantially in Japan over the past three decades. The election in 1990 was only shortly after the *Nikkei* collapsed, pushing Japan into a decade-long period of economic stagnation and deflation. During this period, Japanese debt soared and

⁷Fukada, Takahiro (2009) Big Promises, But Where’s the Funds? *The Japan Times* 7 August.

⁸The figure is based on daily time series data which were obtained from Thomas Reuters’s *Datastream*. See the discussion in section 4 of this chapter.

so did the likelihood of sovereign default. The risk premium on government bonds was high in this period. When elections were held in 2004 and 2006, on the other hand, Japanese bonds were perceived as relatively secure, indicated by a low yield on CDS in that period. CDS yields increased again during the 2007 credit crunch and ensuing economic crisis but eased off shortly before the election in August 2009.⁹ However, they were of comparable magnitude to the late 1990s. In relation to earlier elections, feigning competence was thus still relatively inexpensive, which may explain the DPJ's generous election promises.

This chapter argues that the cost of public debt dampens governments' incentives to borrow strategically before elections. In a nutshell, the argument can be presented as follows. Borrowing is costly to society and both voters and politicians would thus try to minimise it. Yet if governments can feign competence with public debt and thus enhance their electoral stakes they face a trade-off: they want to maximise their chance of retaining office but minimise public debt. The more expensive it is to borrow, the less attractive debt becomes as a strategic instrument, thus reducing the magnitude of political budget cycles.

The chapter will pay particular attention to sovereign risk as a main determinant of the cost of public borrowing, looking at three measures of borrowing costs: 1) sovereign risk ratings; 2) Treasury bond (T-bond) yields; 3) yields on CDS. The argument will be tested in a time series-cross section analysis including data from altogether 29 countries for the period 1980 up to 2008. The evidence is largely supportive of the theory. The remainder of this chapter proceeds as follows. Section two embeds the argument in the academic discourse. Section three presents the theory. Sections four and five discuss the estimation procedure and present the results respectively. The last section concludes.

5.2 Related Literature

The moral hazard model of political budget cycles, as employed in the previous chapter and as it will be employed in this and subsequent chapters, is related to the citizen-candidate model, which was developed independently by Osborne and Slivinsky and Besley and Coate.¹⁰ In their models political candidates are assumed to be ordinary citizens who weigh the benefits and costs of running for an election and then decide whether they should enter the race. If elected they receive utility from implementing their preferred policy; and

⁹ *The Economist* labeled his decline as 'sleepwalking towards disaster', forecasting a potential 'meltdown' of Japanese public finance; *The Economist* (2010c) Sleepwalking Toward Disaster, 10 April.

¹⁰ Osborne, Martin J. and Slivinsky, Al (1996) A Model of Political Competition with Citizen-Candidates, *The Quarterly Journal of Economics*, Vol. 111, No. 1; Besley, Timothy and Coate, Stephen (1997) An Economic Model of Representative Democracy, *Quarterly Journal of Economics*, Vol. 112, No. 1.

as in the original Rogoff and Sibert competence model of political budget cycles (and its successors), they also reap ‘ego rents.’ The citizen-candidate model has gained considerable popularity, in particular because it overcame an important empirical shortcoming of previous models of electoral competition. One famous prediction of Downs’s seminal work on representative democracy was that parties in a two-party system would converge on the median policy-position.¹¹ Yet this prediction does not uphold well empirically. The citizen-candidate model can explain why parties do not converge, namely, if citizen-candidates have different ideological bliss points.

An important insight from this model class is that politicians’ incentives do not systematically differ from that of society as a whole. In other words, to the extent that certain policies are detrimental to society as a whole, politicians have a genuine incentive to avoid them. When governments face an election, the literature, as surveyed in chapter 2, shows that the re-election incentive may trump the desire for fiscal austerity, resulting in pre-election deficits. To this point the literature on context-conditional political budget cycles has focused on the factors that increase the value of holding office and thus the incentive to ‘cheat’ in order to secure re-election. Shi and Svensson focus on corruption arguing that “the more private benefits politicians gain when in power (i.e., higher rents of remaining in power), the stronger are their incentives to influence the voters’ perceptions prior to an election.”¹² Corruption facilitates rent-extraction and thus increases the magnitude of political budget cycles. Another benefit from holding office, in line with the citizen-candidate model, is the authority over policy-making. Alt and Lassen, as well as chapter 4 of this thesis, have shown that ideological polarisation increases the incentives for strategic debt. Whilst corruption and polarisation relate to the benefits of holding office, this chapter turns to the associated costs that result from electioneering.

In models of political budget cycles, public debt is a strategic instrument for governments to enhance their electoral prospects. The more expensive this instrument is, the less likely governments can be expected to be willing to use it. The cost of fiscal manipulation for the purpose of this study is the cost of public debt. When a government issues bonds, it will have to provide for a yield that makes it competitive with other financial instruments. To an extent this will depend on the interest rate as set by the central bank to control inflation. To a large degree, however, it will depend on the risk premium investors will demand based on the government’s probability of default. Credit rating agencies, such as Moody’s, Fitch, and

¹¹ Downs, Anthony (1957) *An Economic Theory of Democracy*, New York, NY: Harper.

¹² Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9, p.1369.

Standard and Poor's, do not reveal their procedures for assessing risk. For this reason, much recent interest in the literature has been devoted to the factors that determine a country's sovereign risk rating.

One argument in the literature is that democracies have better access to credit, known as the 'democratic advantage'.¹³ This argument, although strong in theory, only finds limited support empirically, as shown by Archer *et al.*¹⁴ Rather, these authors suggest, trade, inflation, growth, and bond default determine sovereign ratings. These results echo findings of Biglaiser and DeRouen for a sample of Latin American countries.¹⁵ Thus regime type only seems to have a limited effect on sovereign ratings, even though more studies are likely to be conducted on this issue in the future.

Other factors that have been found to determine a country's credit ratings, and it should be noted that these are at least partially related to regime type, are the strength of budget institutions. Hallerberg and Wolff show that institutions that foster fiscal austerity have a positive impact on credit ratings.¹⁶ In this chapter, credit ratings are an explanatory factor and the cost of public debt will thus be taken as given. However, the chapter bears resemblance to another study. Block *et al.* show that elections affect a country's credit ratings.¹⁷ They argue, much in line with the moral hazard model of political budget cycles, that credit rating agencies *expect* an increase in public debt before an election. Thus, credit downgradings are more likely to occur around elections. This chapter turns their argument around. Whilst Block *et al.* show that political budget cycles affect credit ratings, this article demonstrates that the cost of public debt, which is largely determined by credit ratings, affects the magnitude of budget cycles.

¹³Weingast, Barry R. and Schultz, Kenneth A. (1996) *Democratic Advantage: The Institutional Sources of State Power in International Competition*, Stanford, CA: Hoover Institution Press; Schultz, Kenneth A. and Weingast, Barry R. (1998) Limited Governments, Powerful States, In Siverson, Randolph M., editor *Strategic Politicians, Institutions, and Foreign Policy*, Ann Arbor, MI: The University of Michigan Press; Schultz, Kenneth A. and Weingast, Barry R. (2003) The Democratic Advantage: Institutional Foundations of Financial Power in International Competition, *International Organization*, Vol. 57, No. 1; North, Douglass C. and Weingast, Barry R. (1989) Constitutions and Commitment: The Evolution of Institutional Governing Public Choice in Seventeenth-Century England, *The Journal of Economic History*, Vol. 49, No. 4.

¹⁴Archer, Candace C., Biglaiser, Glen and DeRouen, Karl Jr. (2007) Sovereign Bonds and the 'Democratic Advantage': Does Regime Type Affect Credit Rating Agency Ratings in the Developing World? *International Organization*, Vol. 61, No. 2.

¹⁵Biglaiser, Glen and DeRouen, Karl Jr. (2007) Sovereign Bond Ratings and Neoliberalism in Latin America, *International Studies Quarterly*, Vol. 51, No. 1.

¹⁶Hallerberg, Mark and Wolff, Guntram B. (2008) Fiscal Institutions, Fiscal Policy and Sovereign Risk Premia in EMU, *Public Choice*, Vol. 136, No. 3.

¹⁷Block, Steven A. and Vaaler, Paul M. (2004) The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries, *Journal of International Money and Finance*, Vol. 23, No. 6; Block, Steven A., Vaaler, Paul M. and Schrage, Burkhard (forthcoming) Elections, Opportunism, Partisanship, and Sovereign Ratings in Developing Countries, *Review of Development Economics*.

5.3 Theory

In a similar vein as in the previous chapter, chapter 4, the theory in this chapter, can be easily derived by building on the moral hazard model for political budget cycles, as developed by Persson and Tabellini and refined by Shi and Svensson.¹⁸ Again, voter i 's utility in period t can be expressed as follows:

$$U_s^i = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + \theta^i z_s] \quad (5.1)$$

where β is a discount factor which is assumed to be one. Voters are assumed to have a non-economic bias toward either the incumbent or the challenger which is represented by the term θz , where $z = \{-\frac{1}{2}, \frac{1}{2}\}$ respectively for the incumbent party and the challenger; $\theta \sim \text{unif}[-\frac{1}{2}; \frac{1}{2}]$. $u(c)$ represents the utility for consumption c which is given by:

$$c_t = y - \tau_t \quad (5.2)$$

where y is income and τ is the tax rate. Politician j 's utility is:

$$U_s^j = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + X]; \quad j = \{a, b\} \quad (5.3)$$

where X indicates ego-rents. The incumbent is labeled as a and b is the challenger. Government expenditure g is given by:

$$g_t = \tau_t + d_t - R(d_{t-1}) + \eta_t^j \quad (5.4)$$

where τ is tax revenue and d is the deficit, and η represents competency which is again characterised by a moving average process of competence shocks μ .

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j, \quad j = \{a, b\} \quad (5.5)$$

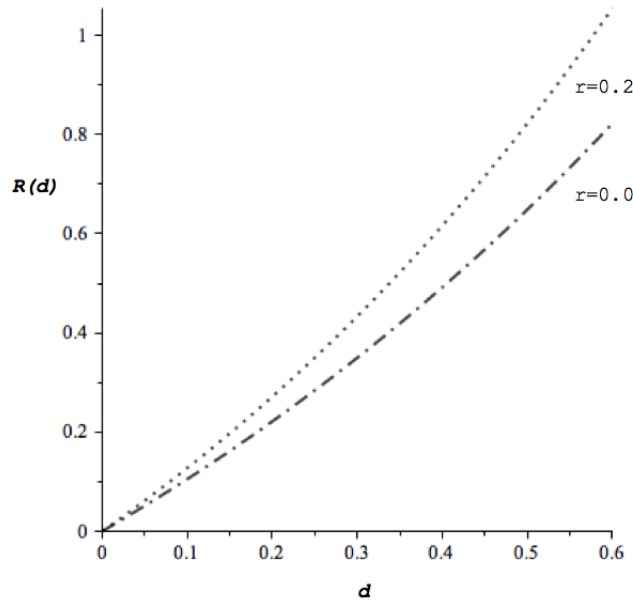
$R(d)$ is the cost of the deficit, which is given by:

$$R(d_{t-1}) = -1 + e^{d_{t-1}(1+r)} \quad (5.6)$$

where r represents the risk premium governments will have to offer on their bonds to make

¹⁸Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press; Shi and Svensson (2006) *Journal of Public Economics* (as in n. 12).

Figure 5.2: Deficits and the cost of borrowing



them attractive to investors. The first derivative of this function, $R'(d_{t-1})$, is consequently

$$R'(d_{t-1}) = (1+r)e^{d_{t-1}(1+r)} \quad (5.7)$$

This specification of the cost function implies for any value of the risk premium, r , that $R(0) = 0$, $R'(d) > 0$, $R'(0) \geq 1$, and $R''(d) > 0$, which corresponds to Shi and Svensson's specification of the cost function.¹⁹ The function implies that the costs from deficits increase exponentially. This functional form can be justified on multiple grounds. For one, debt constitutes postponed taxation and so long as taxes are distortionary, they will have a negative effect on long-run economic performance and future tax revenues. Secondly, governments will compete with private agents for funds and an increase in demand will increase the 'price' of public debt. Governments will have to increase the yield on their bonds to be competitive. In addition, higher interest rates may crowd out private investment, again resulting in lower long-run economic growth.

A higher risk premium, r , magnifies the cost of public debt, as illustrated in figure 5.2. The figure shows that when $d = 0$, the marginal cost is one which means that the cost increases one-by-one with debt, so that the interest rate is zero. As the deficit increases the marginal cost increases, represented by the increasing slope. A higher risk premium increases the slope of the cost curve further, as represented by the two lines for $r = 0$, i.e.

¹⁹Shi and Svensson (2006) *Journal of Public Economics* (as in n. 12), p. 1376.

no risk premium, and $r = 0.2$, a relatively high risk premium. Thus, the cost of borrowing increases more sharply if governments have to pay an additional risk premium. Equilibrium deficit in election-years is zero, as in the previous chapter. The equilibrium tax rate τ^* is determined by maximising the government's utility:

$$\max_{\tau} E_t[g_t + u(c_t) + X] \quad (5.8)$$

$$s.t. \quad g_t = \tau_t + \eta_t \quad (5.9)$$

which yields the equilibrium tax rate, τ^* , given as:²⁰

$$\tau_t = \tau^* = y - u_c^{-1}(1) \quad (5.10)$$

$\tau = \tau^*$ and is the same for both the incumbent a and challenger b . The two candidates will set the same tax rate, however they differ in their competence in delivering public goods given the revenue they collect. Indifferent voters will vote for the candidate that is expected to be more competent. In the case of candidate b , the challenger, voters have no information about competence. They will thus form their expectations on the mean value of μ which is zero. From equations 5.4 and 5.4, expected government expenditure of candidate b in the next period, $t + 1$ is thus:

$$E_t[g_{t+1}^b] = \tau^* - E_t[R(d_t^*)] \quad (5.11)$$

where d^* is the equilibrium deficit in the election year, yet to be derived. The expected government expenditure for the incumbent a can be derived in a similar way, except that voters observe the government's competence in period $t - 1$.

$$E_t[g_{t+1}^a] = \tau^* - E_t[R(d_t^*)] + E_t[\mu_t^a] \quad (5.12)$$

The incumbent candidate will thus be returned to office if:²¹

$$E_t[\mu_t^a] + \theta^i \geq 0 \quad (5.13)$$

The probability of re-election can thus be calculated as follows:

$$Pr(E_t[\mu_t^a] - \theta^i \geq 0) = E_t[\mu_t^a] + \frac{1}{2} \quad (5.14)$$

²⁰The solution to this maximisation problem is described in more detail in the appendix.

²¹This equation is derived in the appendix

Voters are assumed to observe the deficit with a one period time lag. They thus cannot observe d but will form an estimate of it, $\tilde{d}$. Their best guess of the government's competence shock in period t is thus:

$$E_t[\mu_t^a] = \hat{\mu}_t^a = g_t - \tau^* - \tilde{d}_t - \mu_{t-1}^a \quad (5.15)$$

Substituting equation 5.4 and into equation 5.15 yields:

$$E_t[\mu_t^a] = \hat{\mu}_t^a = \mu_t^a + d_t \quad (5.16)$$

From equations 5.14 and 5.16, the probability P that candidate a receives at least 50% of the votes can be expressed as:

$$P_t = Pr(\mu_t^a + d_t - \tilde{d}_t + \frac{1}{2} \geq \frac{1}{2}) = 1 - F(\tilde{d}_t - d_t) \quad (5.17)$$

The government then maximises its expected utility for periods t and $t + 1$.

$$\begin{aligned} \max_d \quad & E_t[\tau^* + d_t + \eta_t^a + u(y - \tau^*) + X] \\ & + E_t[(1 - F(\tilde{d}_t - d_t)) * (\tau^* - R(d_t) + \eta_{t+1}^a + u(y - \tau^*) + X)] \\ & + E_t[F(\tilde{d}_t - d_t) * (\tau^* - R(d_t) + \eta_{t+1}^b + u(y - \tau^*))] \end{aligned} \quad (5.18)$$

The first order condition for this maximisation problem is:

$$1 + f(\tilde{d}_t - d_t)(X) - R'(d_t) = 0 \quad (5.19)$$

In equilibrium the incumbent's choice of the deficit d^* must be consistent with the voters' expectations. Thus in equilibrium $d^* = \tilde{d}_t = d_t$. This means that voters fully understand the government's incentives and correctly anticipate any electoral changes in the deficit. Given the assumptions about the function F , the first order condition in equation 5.19 must hold in equilibrium:

$$1 + f(0)(X) - R'(d^*) = 0 \quad (5.20)$$

Substituting equation 5.7 into equation 5.20 and total differentiating yields the following

statics for equilibrium debt and the risk premium:

$$\frac{\partial d^*}{\partial r} = -\frac{(1 + d^* + d^*r)}{(1 + r)^2} < 0 \quad (5.21)$$

Since both the deficit, d_t , and the risk premium, r , are strictly positive, the equilibrium deficit unambiguously decreases in the cost of borrowing. This relationship is intuitive. If a government borrows before an election in order to feign competence, it will have to spend a larger fraction of the budget on debt servicing, if re-elected. This makes holding office less valuable and in turn, the incentive to manipulate the budget decreases. In accordance with the moral hazard model of political budget cycles, voters understand that governments have a smaller incentive to borrow before elections when borrowing is costly and thus expect a smaller deficit before the election. Thus, a smaller budget cycle is fully expected. The proposition to be tested in the analysis below can be formulated as follows:

Proposition 5.1.

The equilibrium deficit, d^ , decreases as the cost of borrowing, r , increases.*

Proposition 5.1. will be tested in the remainder of this chapter.

5.4 Data

The dependent variable for the analysis is the fiscal deficit. The standard operationalisation is the budget balance as a percentage of GDP. Data were obtained from the *2009 World Economic Outlook*, published by the International Monetary Fund (IMF). Data are available for the period 1980 until 2008, however time series differ in length for individual countries, the panel is thus unbalanced. Deficit data are available mostly for developed countries.

The key independent variable is the cost of public debt. There are several possible operationalisations. This chapter pays particular attention to sovereign risk. For this reason data were collected on sovereign ratings of 25, mostly developed, countries from the rating agency Fitch.²² Fitch rates government bonds on a scale with the lower end at a rating of *D* up to the highest rating of *AAA*. These ratings are converted into an interval scale in increments of one.²³ When a country received two ratings in the same year, the mean was calculated. Due to the spread of the data and potential outliers, the variable will be used

²²Fitch ratings are available at: <http://www.fitchratings.com/web_content/ratings/sovereign_ratings_history.xls> - visited on 1 March 2010.

²³Table A1 provides an overview of the coding. Note that the coding starts with the lowest rating in the sample which is DD. The lowest ranking in the actual analysis is South Korea with a BB+ ranking for a few months in 1998.

in natural logarithms.

In accordance with the literature ratings are for foreign currency, long-term default risk.²⁴ One problem of sovereign risk ratings is that countries, in particular in the developed world, for which deficit data are available, often have *AAA* ratings. Default risk is greater if currency risk is added which is why choosing foreign currency risk allows for greater variation in the independent variable. However, even with this operationalisation, more than 50% of countries in the sample have an *AAA* rating. For this reason the estimation below will also restrict the sample to countries with lower ratings. Credit rating data are available from 1994.

The second operationalisation of borrowing costs are three-month yields on treasury bonds.²⁵ Yields are not only a function of default risk but also of other factors, such as expected inflation and consequent interest rate movements. The choice of a three-month period is mainly motivated by considerations of data comparability across countries. Three-month T-bond yield data are available for a large number of countries.²⁶ A second reason is that they cover the short-term cost of borrowing, which may be particularly relevant shortly before an election. These data were obtained from the financial data service *Global Financial Data*.²⁷ Again, the variable is converted into natural logarithms. Yield data are available from 1980.

T-bond yields and sovereign risk ratings are closely related, as illustrated in figure 5.3. The figure plots the data over time for Germany and Greece. The difference in yields is referred to as the spread and is regularly reported in the business media such as the *Financial Times*. Germany is often chosen as a reference category due to its reputation for fiscal austerity.

The figure shows that yields significantly vary over time, which is largely a result of changing economic conditions and adjustments in monetary policy. The figure clearly shows a remarkable difference between Greek and German yields between 1980 and 2000. Germany has consistently had an *AAA* rating, while Greece had low ratings, with a *BBB-* in 1994. Greece's extraordinarily high borrowing cost is the result of a long string of defaults. Reinhart and Rogoff demonstrate that since its independence in the 19th century, Greece

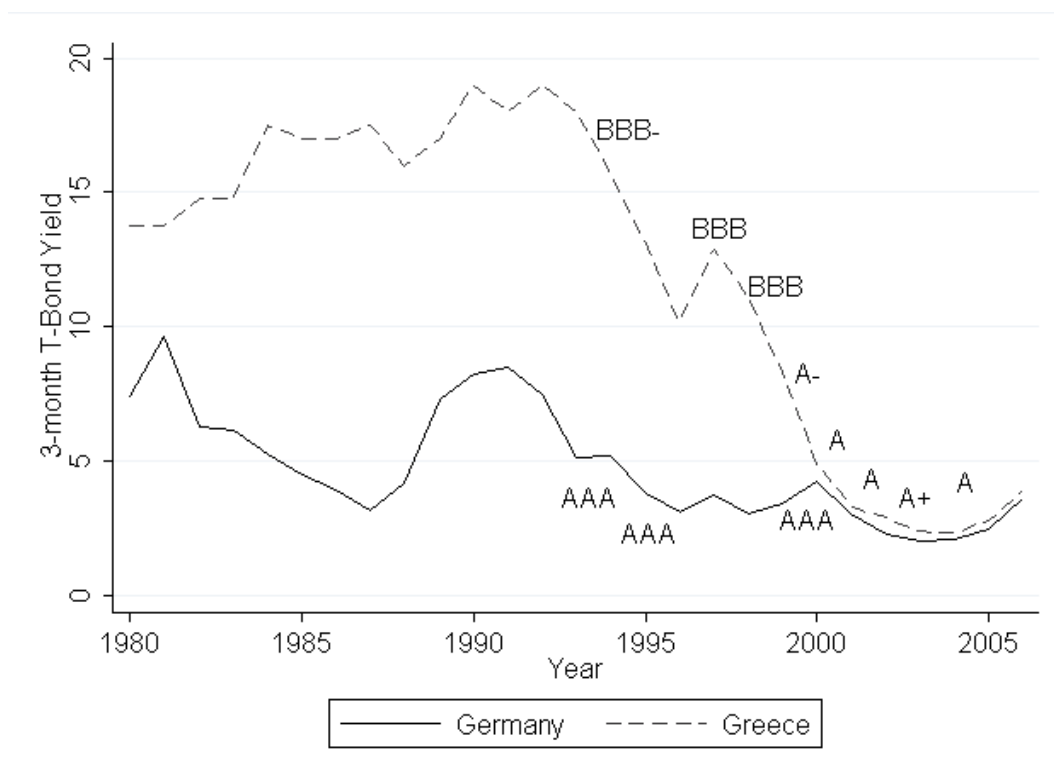
²⁴See, e.g., Block and Vaaler (2004) (as in n. 17).

²⁵Strictly speaking, treasury bonds (T-bonds) are issued by the U.S. Treasury. They are called differently elsewhere, such as gilts in the UK or Bundesschatzbriefe in Germany. Here the term is used interchangeably with government bonds which is common practice in the finance literature.

²⁶The countries are Australia, Austria, Belgium, Canada, Cyprus, Denmark, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Malta, the Netherlands, New Zealand, Portugal, Slovenia, Spain, Sweden, Switzerland, UK, United States.

²⁷T-bond yield data are available from <<https://www.globalfinancialdata.com>> - visited on 1 March 2010.

Figure 5.3: The cost of borrowing: Germany and Greece



Note: Sovereign risk data obtained from the rating agency Fitch; data on T-bond yields obtained from the financial data service *Global Financial Data*.

has been in default roughly one out of every two years.²⁸ With the accession to the Euro, Greece's sovereign risk ratings have improved dramatically to a rating of A or even a short period of an A+ rating in 2003. However, in line with Gómez-Puig, monetary union has not resulted in a perfect conversion of yields.²⁹ Greece has consistently had a lower sovereign rating than Germany and has thus consistently had higher yields, i.e. higher borrowing costs.³⁰ Both operationalisations of borrowing costs, sovereign risk ratings and T-bond yields will be used in the analysis below.

A third measure that provides information on how the market perceives the risk of sovereign default is the yield on CDS. CDS are essentially a form of insurance against the default on bonds, be they from companies or governments. The higher the risk of sovereign default is the more of an incentive bond holders have to hedge risk and buy insurance in form of a CDS. Accordingly, bond and CDS yields are highly correlated. However, they are conceptually different and CDS yields will thus be used as a third operationalisation for the

²⁸ Reinhart, Carmen M. and Rogoff, Kenneth (2009) *This Time Is Different: Eight Centuries of Financial Folly*, Princeton, NJ: Princeton University Press.

²⁹ Gómez-Puig, Marta (2008) Monetary Integration and the Cost of Borrowing, *Journal of International Money and Finance*, Vol. 27, No. 3.

³⁰ In fact, in response to debt levels believed to be unsustainable in April and May 2010, Greece's borrowing costs increased dramatically as several rating agencies downgraded Greek government bonds to 'junk status'.

cost of public debt because it is an indicator of the risk premium investors will demand when buying government bonds. Data on CDS bid yields are available from Thomas Reuters's *Datastream*. As with bonds, CDS yields come with different maturities. To guarantee comparability and at the same time maximise the number of observations, two year CDS bid yields will be employed.³¹ Time series differ in length but range from the years 1979 to 2008.³² As with the other three measures of the cost of borrowing, the variable will be calculated in natural logarithms.

In the previous chapter, chapter 4, the key independent variable (government popularity) was lagged. This was partly motivated by the timing of the budget process in OECD countries and partly by considerations of possible endogeneity. The data used to determine the timing of the budget do not cover all of the countries included in the analysis in this chapter. The variables could thus all be lagged by one year. However, this is not as nuanced an approach as in the previous chapter. Moreover, the estimation procedure used in this chapter, explained below, will allow for instrumenting of endogenous variables, thus reducing the concern of endogeneity. In most democracies, the budget can be amended during the term in order to allow to finance unexpected short-falls in revenue. Borrowing is thus relatively flexible. Although the variables will thus not be lagged for the main analysis in this chapter, lagged values were calculated for additional robustness checks of the findings below.

A second key independent variable is an election dummy, which will be interacted with the variables measuring the cost of borrowing to detect the presence of political budget cycles. Election data were obtained from the World Bank's *Database for Political Institutions* (DPI).³³ The variable was coded depending on the DPI's classification of a country's regime type, such that the variable is coded for legislative elections in parliamentary regimes and executive elections in presidential regimes.³⁴ The variable was manually extended up to the year 2008.

Control variables are chosen as standard in the literature, most notably GDP growth GDP per capita (logs).³⁵ Together with the dependent variable, these variables were taken from the IMF's *2009 Economic Outlook*. Two additional control variables are chosen. For the

³¹The countries included in the CDS sample are: Australia, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, UK, US.

³²The average length of the time series is 22 years.

³³Beck, Thorsten et al. (2001) New Tools in Comparative Political Economy: The Database of Political Institutions, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

³⁴This approach corresponds to Brender and Drazen's construction of the election dummies, as used in the previous chapters; Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

³⁵See, e.g. Shi and Svensson 2006.

analysis of sovereign risk ratings on the budget balance, the age of the governing party will be controlled for (the variable is calculated in decades). This is supposed to control for the potential effects of the degree of democratic consolidation,³⁶ or the literature on ‘democratic advantage’, as described above. This variable is taken from the DPI and is available up to the year 2006. To control for possible exchange rate effects or the openness of the economy, the trade balance will be controlled for when estimating the effect of T-bond and CDS yields on the budget balance. This variable, measured as the current account as a percentage of GDP, was also taken from the IMF’s *2009 World Economic Outlook*. Descriptive statistics for all variables can be found in the appendix.

5.5 Estimation

To test proposition 5.1 the following model will be estimated:

$$\begin{aligned} F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 COST_{i,t} \\ & + \beta_4 ELECT_{i,t} * COST_{i,t} + \gamma' \mathbf{X}_{i,t} + \eta_i + \lambda_t + \nu_{i,t} \end{aligned} \quad (5.22)$$

, where $i = 1, 2, \dots, N$ and $t = 1, \dots, T$. $F_{i,t}$ is the indicator of fiscal policy, i.e. the budget balance. It should be kept in mind that *negative* values correspond to a budget deficit. A dummy variable, $ELECT$ captures whether an election was held in year t . $COST$ captures the two operationalisations of borrowing costs: sovereign risk ratings and T-bond and CDS yields. According to proposition 5.1, the cost of public debt should moderate the negative effect of election years on the budget balance. For this reason, it is expected that the marginal effect of $ELECT$ conditioned on $COST$ is negative but approaching zero for higher values of $COST$.

The model is dynamic and thus includes a lagged dependent variable, $F_{i,t-1}$. Control variables enter the specification as $\gamma' \mathbf{X}_{i,t}$. The parameters η_i and λ_t are the country and time specific error terms while $\nu_{i,t}$ indicates the overall error. The β ’s represent the parameters to be estimated.

Estimating the model with fixed effects (FE) to account for the unit heterogeneity is problematic in two ways. First, one of the key independent variables, a country’s credit rating, rarely changes over time which means that mean-differencing wipes out a great

³⁶See, e.g. Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 34).

amount of variation. Second, as already explained in chapter 4, FE are problematic in a dynamic panel model because the lagged dependent variable is correlated with the FE error term, resulting in significant bias of the estimates.³⁷ FE estimation is consistent as the length of the time series goes to infinity.³⁸ The longest time series in the sample encompasses 28 years (for the period 1980 to 2008), however most time series are significantly shorter, in particular for the credit ratings which are only available from the mid 1990s. For this reason using an FE model is not appropriate.

The analysis will thus rely on a General Method of Moments (GMM) estimator that remedies both problems at the same time. This estimator is commonly used in the recent literature on context-conditional political budget cycles.³⁹ Arellano and Bond developed the basic GMM estimator, referred to as difference-GMM.⁴⁰ It eliminates the unit effects by taking first differences and instruments the lagged dependent variable with past lags (thus extending the work by Anderson and Hsiao).⁴¹ Arellano and Bover and Blundell and Bond shows in later papers that the difference-GMM estimator, performs poorly when the dependent variable is highly persistent over the time.⁴² They introduce a new estimator, referred to as system-GMM, that combines the use of levels and differences, using lagged differences and lagged levels respectively as instruments for the lagged dependent variable.

This estimator is appropriate for the purposes of this chapter. Firstly, data on budget deficits tend to be highly persistent, which makes system-GMM a superior alternative to difference-GMM. Secondly, it eliminates the problems of FE estimation explained above. Instrumenting the lagged dependent variable with lags remedies the so-called Nickell-bias. Moreover, since system-GMM also makes use of levels in the estimation, the variation in rarely changing variables is preserved. A last reason to why the analysis below will employ system-GMM is that it easily allows to incorporate variables that are only weakly exogenous.

³⁷Nickell, Stephen J. (1981) Biases in Dynamic Models with Fixed Effects, *Econometrica: Journal of the Econometric Society*, Vol. 49, No. 6.

³⁸Kiviet, Jan F. (1995) On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 68, No. 1.

³⁹See, e.g. Shi and Svensson (2006) *Journal of Public Economics* (as in n. 12); Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 34). Shi and Svensson even go as far as to argue that the use of this estimator is one of the main recent methodological advances in the study of political budget cycles, Shi, Min and Svensson, Jakob (2003) Political Budget Cycles: A Review of Recent Developments, *Nordic Journal of Political Economy*, Vol. 29, No. 1.

⁴⁰Arellano, Manuel and Bond, Stephen (1991) Some Tests of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, Vol. 58, No. 2.

⁴¹Anderson, Theodore W. and Hsiao, Cheng (1981) Estimation of Dynamic Models with Error Components, *Journal of the American Statistical Association*, Vol. 76, No. 375; Anderson, Theodore W. and Hsiao, Cheng (1982) Formulation and Estimation of Dynamic Models Using Panel Data, *Journal of Econometrics*, Vol. 18, No. 1.

⁴²Arellano, Manuel and Bover, Olympia (1995) Another Look at the Instrumental Variables and GMM: Estimation and Testing, *Stata Journal*, Vol. 3, No. 1; Blundell, Richard and Bond, Stephen (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 87, No. 1.

The analysis examines the flipside of the argument advanced by Block and Vaaler that political budget cycles affect credit ratings.⁴³ Endogeneity is thus a potential problem. Similarly, the analysis shows that economic growth is not strictly exogenous in this sample. Thus, the *COST* measures and economic growth will also be instrumented with earlier lags.

The Arellano-Bond estimator was originally conceived for panels with small T and large N . The time series in this analysis are relatively long; using all lags of the endogenous variables weakens the estimator.⁴⁴ For this reason, only three lags of the dependent variable and two lags of the other two endogenous variables will be used. It should be noted that the results are not very sensitive to the choice of the number of instruments. Lastly, Windmeijer proposes a correction for using the Arellano-Bond estimator in small samples and will be implemented in the analysis below.⁴⁵ The Arellano-Bond estimator was developed under the assumption of spatial independence. Time dummies are included to control for correlation across groups in the idiosyncratic disturbances.

All results will be presented in accordance with Bond's recommendations on implementing the GMM estimator.⁴⁶ If implemented correctly, the GMM estimate of the lagged dependent variable should lie in between the FE estimate (which biases the estimate downward) and the pooled estimate (which biases the estimate upward). The tables below also report the AR1 and AR2 statistics for first-differenced residuals. First-order autocorrelation should exist by construction due to the lagged dependent variable in differenced equations. For the validity of second and lower lags as instrument, second-order autocorrelation must be absent, however.

5.6 Results

Table 5.1 shows the estimation results for the statistical model including log sovereign risk ratings ($LnSVR$) as a measure of borrowing costs. Columns one through three omit the interaction term between borrowing costs and the election dummy. The coefficient of the lagged dependent variable for the GMM model in column three lies comfortably in between the pooled estimate (column one) and the FE estimate (column two). The differenced residuals exhibit first-order but no second-order autocorrelation. The model

⁴³Block and Vaaler (2004) (as in n. 17).

⁴⁴Bowsher, Clive G. (2002) On Testing Overidentifying Restrictions in Dynamic Panel Models, *Economics Letters*, Vol. 77.

⁴⁵Windmeijer, Frank (2005) A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators, *Journal of Econometrics*, Vol. 126, No. 1.

⁴⁶Bond, Stephen R. (2002) Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice, *Portuguese Economic Journal*, Vol. 1, No. 2.

Table 5.1: Sovereign risk ratings and political budget cycles

Dep. variable	Budget balance							
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Method	Pooled	FE	GMM	Pooled	FE	GMM	GMM	GMM
Sample	Full	Full	Full	Full	Full	Full	< AAA	Weak
Balance (L1)	0.87*** (0.05)	0.57*** (0.13)	0.59*** (0.16)	0.87*** (0.05)	0.57*** (0.13)	0.61*** (0.20)	0.48** (0.24)	0.43* (0.24)
Growth	0.16*** (0.05)	0.12 (0.11)	0.19*** (0.07)	0.16*** (0.05)	0.12 (0.11)	0.17* (0.07)	0.20*** (0.09)	0.18** (0.78)
LnGDP	0.70 (0.51)	1.86 (1.49)	2.44* (1.38)	0.66 (0.50)	1.86 (1.50)	1.79 (1.37)	0.93 (0.86)	0.83 (1.00)
Party Age	0.04* (0.02)	-0.01 (0.07)	0.06 (0.08)	0.04* (0.02)	-0.01 (0.74)	0.08 (0.97)	0.18* (0.10)	0.11 (0.11)
Elect	-0.27 (0.18)	-0.25** (0.12)	-0.15 (0.14)	7.64 (8.72)	0.72 (3.93)	8.59 (6.97)	18.42** (8.44)	16.57** (7.81)
LnSVR	-1.18 (1.19)	0.45 (3.49)	-2.58 (2.66)	-0.73 (1.13)	0.50 (3.53)	-4.57 (4.92)	-0.70 (2.58)	0.74 (2.21)
Elect x LnSVR				-2.53 (2.78)	-0.31 (1.26)	-2.82 (2.21)	-6.09** (2.72)	-5.46** (2.41)
AR(1) ^a			-3.53 (0.00)			-3.50 (0.00)	-3.15 (0.00)	-3.00 (0.00)
AR(2) ^a			0.84 (0.40)			-0.97 (0.33)	-0.79 (0.43)	-0.54 (0.59)
No. countries	25	25	25	25	25	25	16	16
No. obs	304	304	304	304	304	304	156	188

*** p<0.01, ** p<0.05, * p<0.1

(Robust) Standard errors in parentheses

a: p-values in parentheses

thus seems correctly specified. On its own, both the election dummy and sovereign risk ratings have no significant effect on the budget balance. This is not surprising. The 25 countries included in the sample are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. These are generally developed countries and well established democracies, where political budget cycles are often found to be small.⁴⁷

Turning to columns four through six, the analysis is repeated but includes an interaction term between the election model and log credit ratings. The diagnostics again suggest that the model is correctly specified with the lagged dependent variable lying comfortably between the pooled (column four) and FE (column five) estimate; the autocorrelation structure also suggests correct specification. The interaction term is not statistically significant. However, it is correctly signed: countries with higher credit ratings have a larger deficit in election years.

In fact, merely looking at the statistical significance of interaction terms is not always informative. Table 5.4 presents the joint marginal effect of election years, conditioned on different values of the sovereign risk variable. Indeed, only in the lower quartile (p25) of the sovereign risk data the effect of election years on the budget balance is statistically indistinguishable from zero. However, at the median (p50) and the third quartile (p75) the effect is statistically significant at the 5% level. Since the data are heavily skewed toward higher credit ratings, the joint effects between the median and the third percentile are not vastly different, however, with -0.3% in the budget balance at the median and -0.36% at the third quartile.

Since the variable is so skewed, columns seven and eight present the GMM results for restricted samples (the pooled and FE estimates are omitted but the dependent variable lies in the admissible interval). In column seven, the sample is restricted to cases that do not have an AAA credit rating. This cuts the sample roughly in half and thus constitutes a significant loss in observations.⁴⁸ The interaction effect between the election dummy and the sovereign risk variable is now significant at the 5% level. Looking at table 5.4 again, the joint effect is still significant for the median and the third quartile (at 1% and 10% respectively) and overall effect for the countries with the higher credit ratings is rather substantial at

⁴⁷See, e.g. Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 34); Shi and Svensson (2006) *Journal of Public Economics* (as in n. 12).

⁴⁸The countries included are Australia, Belgium, Canada, Czech Republic, Denmark, Finland, Greece, Iceland, Ireland, Italy, Japan, Korea, New Zealand, Portugal, Spain, Sweden.

Table 5.2: T-Bond yields and political budget cycles

Dep. variable	Budget balance					
Model	(9)	(10)	(11)	(12)	(13)	(14)
Method	Pooled	FE	GMM	Pooled	FE	GMM
Sample	Full	Full	Full	Full	Full	Full
Balance (L1)	0.84*** (0.03)	0.76*** (0.03)	0.78*** (0.05)	0.84*** (0.03)	0.76*** (0.03)	0.78*** (0.05)
Growth	0.25*** (0.04)	0.31*** (0.05)	0.38*** (0.07)	0.25*** (0.04)	0.31*** (0.05)	0.35*** (0.06)
LnGDP	0.50* (0.26)	-0.47 (0.76)	0.34 (0.56)	0.50* (0.26)	-0.47 (0.75)	0.20 (0.44)
Trade	0.03* (0.02)	0.04* (0.02)	0.03 (0.03)	0.03* (0.02)	0.04* (0.02)	0.05** (0.03)
Elect	-0.34** (0.14)	-0.35* (0.17)	-0.41** (0.16)	-0.60* (0.36)	-0.59* (0.35)	-1.31*** (0.32)
LnBond	0.11 (0.13)	0.18 (0.14)	0.20 (0.18)	0.08 (0.14)	0.15 (0.15)	0.11 (0.16)
Elect x LnBond				0.15 (0.20)	0.13 (0.19)	0.54*** (0.19)
AR(1) ^a			-3.49 (0.00)			-3.36 (0.00)
AR(2) ^a			-1.10 (0.27)			-1.08 (0.28)
No. countries	24	24	24	24	24	24
No. obs	553	553	553	553	553	553

*** p<0.01, ** p<0.05, * p<0.1

(Robust) Standard errors in parentheses

a: p-values in parentheses

-0.68% of GDP.

In column eight, the sample of column seven is slightly expanded because it includes all cases that did not consistently have *AAA* ratings. The number of countries is identical, however the time series increase because the sample now includes a few countries with *AAA* ratings. Again, the interaction term is significant at the 5% level. The joint effect in table 5.4, however, is only significant at the third quartile. Yet the magnitude of the joint effect at the median compares to the coefficient in the unrestricted sample (column six) and may only be statistically insignificant due to the restricted sample size.

Table 5.2 reports the results for the analysis with log T-bond yields (*LnBond*) as the conditioning independent variable. The sample includes 24 countries. With a few exceptions that are due to data coverage, the countries included in the analysis for tables 5.1 and 5.2 are identical. However, since longer time series are available for T-bond yields, the analysis in table 5.2 has significantly more observations.

Columns nine through eleven again present the empty model which does not include the interaction between the election dummy and log T-bond yields. The coefficient for the lagged

Table 5.3: CDS Bid yields and political budget cycles

Dep. variable	Budget balance					
Model	(15)	(16)	(17)	(18)	(19)	(20)
Method	Pooled	FE	GMM	Pooled	FE	GMM
Sample	Full	Full	Full	Full	Full	Full
Balance (L1)	0.84*** (0.03)	0.83*** (0.26)	0.84*** (0.03)	0.84*** (0.03)	0.83*** (0.03)	0.84*** (0.02)
Growth	0.37*** (0.07)	0.37*** (0.07)	0.37*** (0.07)	0.37*** (0.07)	0.38*** (0.08)	0.38*** (0.07)
LnGDP	0.28** (0.14)	0.28 (0.21)	-1.20** (0.57)	-0.09 (0.40)	-0.41 (0.75)	-0.78 (0.65)
Trade	0.07*** (0.02)	0.07** (0.02)	0.36 (0.03)	0.07*** (0.02)	0.65** (0.02)	0.05* (0.03)
Elect	-0.42*** (0.15)	-0.42*** (0.13)	-0.27*** (0.10)	-0.63** (0.32)	-0.63** (0.22)	-0.62*** (0.20)
LnCDS	0.28* (0.14)	0.28 (0.21)	0.18 (0.13)	0.23 (0.16)	0.23 (0.23)	0.14 (0.13)
Elect x LnCDS				0.14 (0.20)	0.14* (0.08)	0.17** (0.08)
AR(1) ^a			-2.67 (0.01)			-2.65 (0.01)
AR(2) ^a			-1.19 (0.23)			-0.67 (0.51)
No. countries	11	11	11	11	11	11
No. obs	243	243	243	243	243	243

*** p<0.01, ** p<0.05, * p<0.1

(Robust) Standard errors in parentheses

a: p-values in parentheses

dependent variable lies in between the FE and the pooled estimate, as required, and the autocorrelation structure in the differenced residuals suggests that the chosen instruments are valid. The election dummy is significant at the 5% level and of a relatively considerable magnitude of -0.41. T-bond yields on their own are not statistically significant.

Columns twelve through fourteen add the interaction between the election dummy and T-bond yields. Again, the diagnostics suggest that the model is correctly specified. The interaction effect is significant at the 1% level. Table 5.4 calculates the joint effects for the first three quartiles of the yield variable. The effect is significant at the 1% level for low yields with an election year budget balance of -0.5 of GDP. At the median, the effect is still significant at the 5% level with -0.34. At the third quartile the effect is not statistically differentiable from zero.

Lastly, table 5.3 presents the results for the analysis of CDS (*lnCDS*) and their impact on the budget balance. Columns fifteen through seventeen, again, present the model without the interaction term between election years and CDS yields. It is interesting to see that the coefficient for the lagged dependent variable is only marginally different for the FE and

Table 5.4: Marginal effects

Model		(6)	(7)	(8)	(14)	(20)
Sample		Full	< AAA	Weak	Full	Full
Marginal effect		LnSVR			LnBond	LnCDS
Percentile of conditioning variable	p(75)	-0.36** (0.16)	-0.68*** (0.25)	-0.55*** (0.22)	-0.06 (0.23)	-0.25** (0.11)
	p(50)	-0.30** (0.15)	-0.41* (0.24)	-0.30 (0.20)	-0.34** (0.17)	-0.35*** (0.12)
	p(25)	-0.12 (0.21)	-0.13 (0.28)	-0.05 (0.26)	-0.50*** (0.16)	-0.42*** (0.13)

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses

the pooled models. This suggests that the Nickell bias is relatively small which is likely to be due to the relatively long time series. Again, the GMM estimate lies in between these two estimates, suggesting that the model is correctly specified. This is also supported by the structure in the differenced errors. It should be noted that the effect of election years is consistently negative and that the effect of CDS yields has no statistically significant effect on the budget balance under any of the specifications.

Columns eighteen through twenty repeat the analysis but include the interaction term between CDS yields and election years. The effect of election years is negative and the interaction term is positive and significant at the 5% level. This suggests that the budget deficit decreases in election years but by increasingly less as perceived default risk increases. Table 5.4 illustrates this effect at different levels of the conditioning variable. At the first, second, and third quartile, the effect of election years is significant at the 5% level or higher, increasing from -0.25 when the risk of default is relatively high and borrowing costly to -0.42 when the risk of default is low and borrowing relatively cheap. This provides further support for proposition 5.1.

Figures 5.4, 5.5, and 5.6 graphically illustrate the joint effects of election years, conditional on the cost of borrowing.⁴⁹ Figure 5.4 plots the effect for the weak sample (column eight). The downward sloping line indicates that a higher credit rating results in a more pronounced budget cycle. This provides support for proposition 5.1, since a higher sovereign risk rating implies lower borrowing costs (lower risk premia) and thus a greater incentive for governments to borrow before elections. The dotted lines represent 95% confidence intervals, demonstrating that the effect is statistically significant for more than half of the (logged) sovereign risk values in the sample.

A similar story is told by figures 5.5 and 5.6. A higher T-bond yield or CDS yield,

⁴⁹The figures are based on Brambor, Thomas, Clark, William R. and Golder, Matt (2006) Understanding Interaction Models: Improving Empirical Analyses, *Political Analysis*, Vol. 14, No. 1.

Figure 5.4: Marginal effect: Elections and sovereign risk (weak sample)

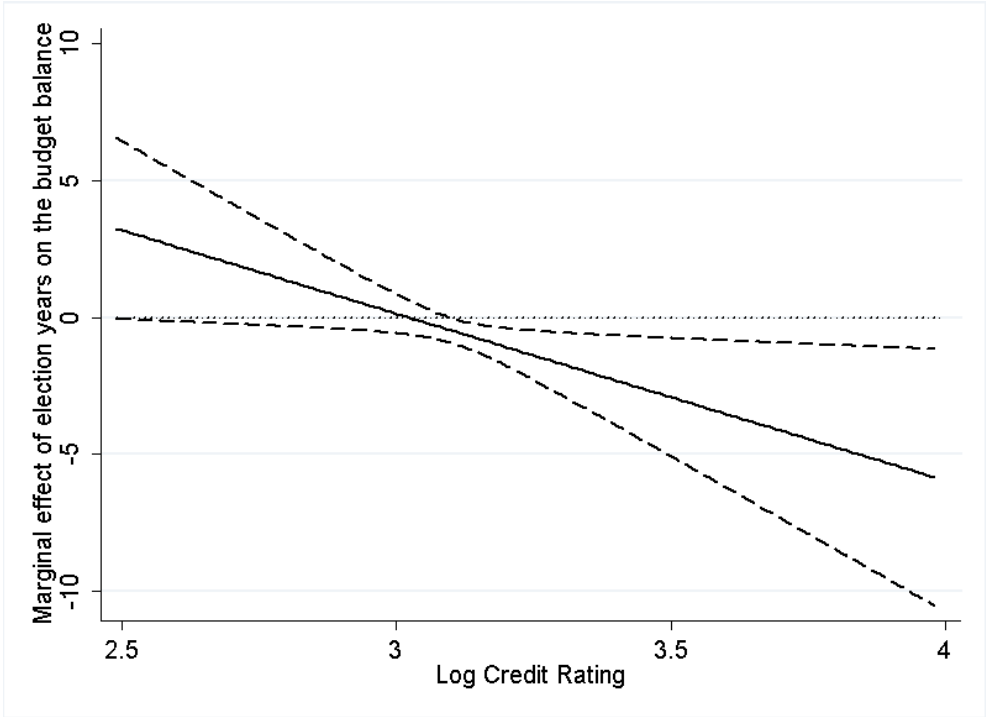


Figure 5.5: Marginal effect: Elections and T-bond yields

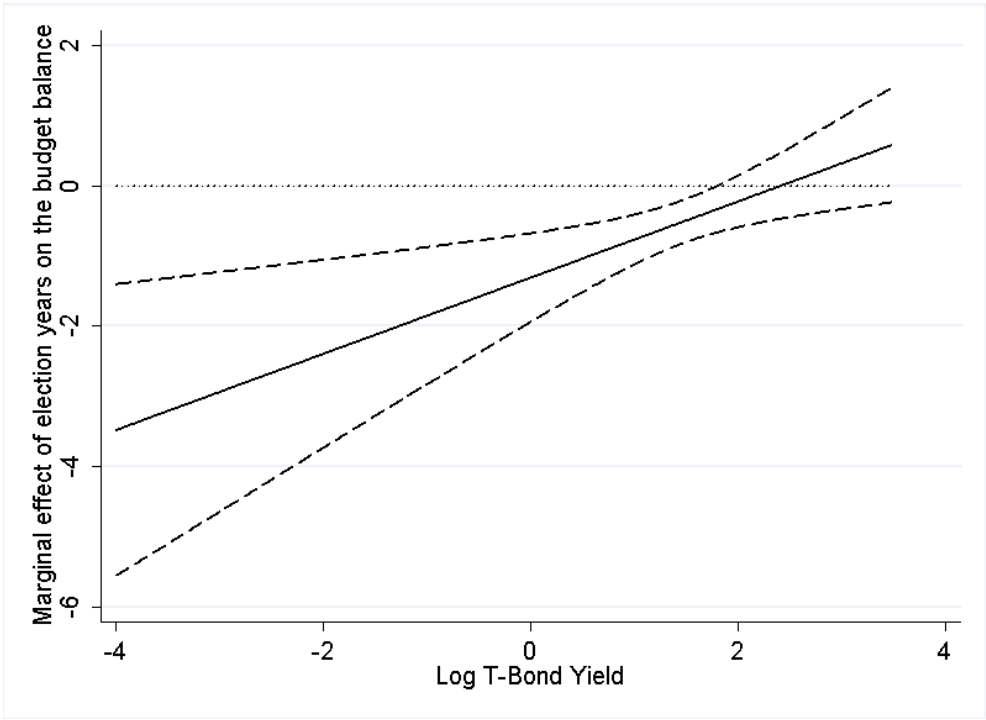
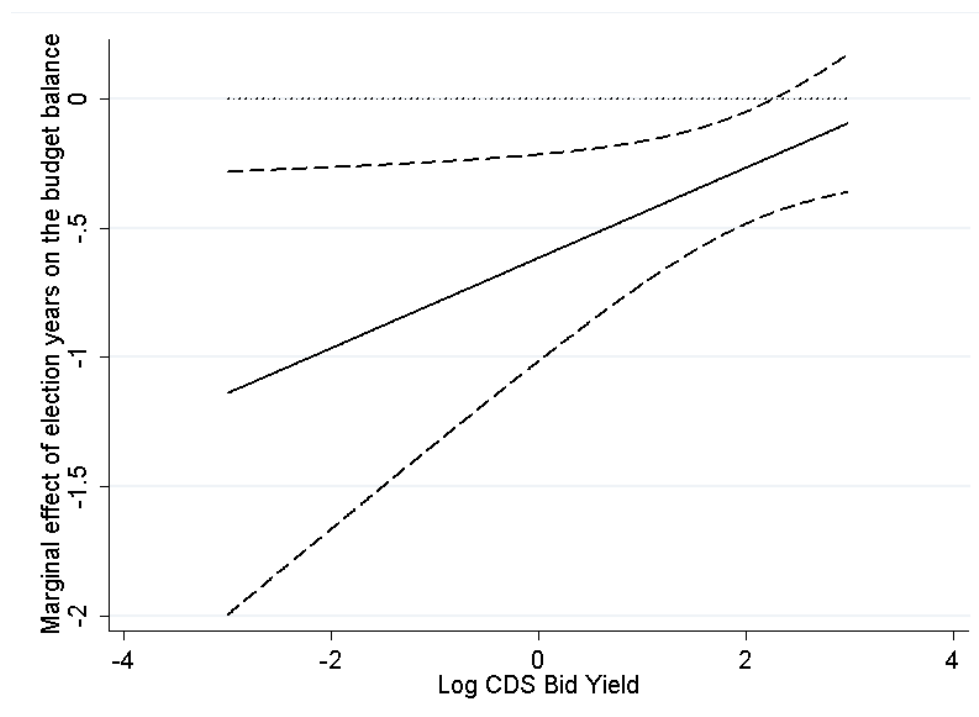


Figure 5.6: Marginal effect: Elections and CDS bid yields



in other words costlier borrowing, implies a higher budget balance in election years. The confidence intervals indicate that the effect is significant over roughly three quarters of the values of the yield variable in the sample. Taken together, the results summarised in table 5.4, and figures 5.4, 5.5, and 5.6 provide strong empirical support for proposition 5.1.

Several checks were carried out to test the robustness of the findings. First, the variables were lagged by one year, in accordance with the procedure in the previous chapter, chapter 4. The results uphold, however, they are statistically weaker. Secondly, a dummy variable was included to capture membership in the eurozone. As figure 5.3 illustrates, Euro membership can have a dramatic effect on a country's perceived probability of default. The findings are robust to this additional specification. Similarly, as Hallerberg and Wolff argue, fiscal institutions affect risk premia.⁵⁰ Controlling for federal system and centralisation with data from the World Bank's *Database of Political Institutions* does not weaken the effects, however.⁵¹ The findings are also robust to the inclusion of measures of the exchange rate and inflation, both obtained from the IMF's *2009 Economic Outlook*, and the fraction of the working age population, a measure obtained from the World Bank's *World Development Indicators*.

⁵⁰Hallerberg and Wolff (2008) (as in n. 16).

⁵¹Beck et al. (2001) (as in n. 33). Data taken from the *Database of Political Institutions* are only available up to the year 2006, thus reducing the sample size.

As explained in chapter 1 of this thesis, partisanship can have a potential impact on deficits. To check for possible confounding effects of partisanship, a measure of the executive's left-right position was retrieved from the DPI. This variable does not enter the specification as statistically significant, which is generally in line with the literature as well as the findings in chapter 4. It does not affect the strength of the key results.

Lastly, it could be argued that the true underlying effect captured by the measures of borrowing costs is the general state of the economy. The recent financial and economic crisis has demonstrated how an economic downturn can spell trouble to public finances and their perceived sustainability. Economic shocks are partly controlled for in the analysis through the measure for economic growth. For robustness purposes, another measure of economic performance that was employed is economic volatility, measured as the variance in quarterly economic growth. The results are robust to including this additional variable. Indeed, chapter 9 finds, at least for the T-bond yield measure that the result is very robust, even when including all variables used in this thesis. Proposition 5.1 just receives rather strong support from the empirical analysis.

5.7 Conclusion

How does the cost of public debt affect governments' incentives to borrow before elections? This chapter has shown that higher borrowing costs result in smaller political budget cycles. The relationship is intuitive: if governments can be perceived as citizen-candidates, they internalise the cost of public debt. Feigning competence in order to enhance its electoral fate thus comes at a cost to a government; and the higher this cost is, the smaller is the incentive to use debt as a strategic instrument. The argument is underpinned by empirical evidence which employs three different measures of the cost of borrowing: sovereign risk ratings from the rating agency Fitch, T-Bond yields and yields on CDS. The findings are rather robust to a number of specifications and empirical support for the theoretical proposition is thus considerable.

The evidence is based on altogether 29 democracies for the period between 1980 and 2008. One strength of the analysis is the time-frame. With data ranging up to the year 2008, this is the most recent dataset employed for the study of political budget cycles. A downside, however, results from the cross-sectional characteristics. Generally, the countries included in this analysis are developed democracies. This is primarily a consequence of data availability, in particular with respect to deficit data; but it is also difficult to obtain

long time-series measures of borrowing costs for developing countries. The restriction to developed countries limits the external validity of the findings - however, since much of the literature argues that political budget cycles are particularly weak in developed countries,⁵² the results are remarkable and likely to be even stronger in the developing world.

The results are interesting, in particular in an environment of high deficits, as during the global financial and economic crisis of 2007-2010. With sovereign risk being a real threat in many parts of the world, political budget cycles can be expected to be relatively smaller in magnitude. To the extent that political budget cycles are an inefficiency and decrease societal welfare, this may provide for some positive news.

⁵²See, e.g., Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 34); Shi and Svensson (2006) *Journal of Public Economics* (as in n. 12).

5.8 Appendix

5.8.1 Theoretical

The government's maximisation problem from equations 5.8 and 5.9 can be re-stated as:

$$\max_{\tau} E_t[g_t + u(c_t) + X] \quad (5.1)$$

$$s.t. \quad g_t = \tau_t + \eta_t \quad (5.2)$$

The first order condition for is:

$$\begin{aligned} \frac{\partial g_t}{\partial \tau} + \frac{\partial u(c_t)}{\partial \tau} &= \frac{\partial(\tau_t + \eta_t)}{\partial \tau} + \frac{\partial u(y - \tau_t)}{\partial \tau} = 1 - u_c(y - \tau_t) = 0 \\ \rightarrow 1 &= u_c(y - \tau_t) \quad \rightarrow u_c^{-1}(1) = y - \tau_t \\ \rightarrow \tau_t &= \tau^* = y - u_c^{-1}(1) \end{aligned} \quad (5.3)$$

2) Election condition

Deriving equation 5.13, the government will be returned to office if voter i's expected utility from seeing candidate a in office in period $t + 1$ is greater than from candidate b

$$E_t[g_{t+1}^a + u(c_{t+1}) + \theta^i z^a] - E_t[g_{t+1}^b + u(c_{t+1}) + \theta^i z^b] \geq 0 \quad (5.4)$$

Voters know the equilibrium tax rate τ^* and they also know that the equilibrium deficit in off-election years is zero. Moreover, voters expectation of the incumbent's competence in period $t + 1$ is $E[\eta_{t+1}^a] = \mu_t^a + E[\mu_{t+1}^a] = \mu_t^a$. Given the distributional assumptions about μ , the expected competence for candidate b is zero. Recalling that $z = -\frac{1}{2}$ for candidate a and $z = \frac{1}{2}$ for candidate b yields:

$$\begin{aligned} E_t[\tau^* + \mu_t^a + u(c_t) + (-\frac{1}{2}\theta^i)] &- E_t[\tau^* + u(c_t) + (\frac{1}{2}\theta^i)] \\ &= E_t[\mu_t^a] - \theta^i \geq 0 \end{aligned} \quad (5.5)$$

5.8.2 Empirical

Table 5.1: Numerical coding of Fitch Ratings

Fitch Rating	Numerical Code
AAA	24
AA+	23
AA	22
AA-	21
A+	20
A	19
A-	18
BBB+	17
BBB	16
BBB-	15
BB+	14
BB	13
BB-	12
B+	11
B	10
B-	9
CCC+	8
CCC	7
CCC-	6
CC	5
C	4
DDD+	3
DDD	2
DDD-	1
DD	0

Table 5.2: Descriptive statistics for full sample (sovereign risk ratings)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	304	-1.08	-1.51	3.95	-13.44	18.48
Growth	304	3.12	2.91	2.04	-6.85	11.50
LnGDP	304	10.16	10.19	0.48	8.58	11.49
PartyAge	304	6.09	5.60	3.54	0.10	15.45
(SVR)	304	22.54	23.5	2.11	11.5	24
LnSVR	304	3.11	3.16	0.10	2.44	3.18
Elect	304	0.27	0	0.44	0	1

Note: PartyAge in decades

Table 5.3: Descriptive statistics for full sample (T-Bond yields)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	533	-3.00	-2.83	3.65	-15.73	6.32
Growth	533	2.78	2.75	2.12	-3.37	11.50
LnGDP	533	9.83	9.90	0.56	7.86	11.08
Trade	533	-0.99	-0.90	4.65	-34.65	14.85
(Yield)	533	7.29	6.00	4.68	0.01	33.10
LnYield	533	1.76	1.79	0.77	-4.61	3.50
Elect	533	0.29	0	0.46	0	1

Table 5.4: Descriptive statistics for full sample (CDS bid yields)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	243	-2.52	-2.67	3.15	-11.44	3.79
Growth	243	2.52	2.65	1.70	-2.10	7.19
LnGDP	243	10.12	10.11	0.36	9.15	10.87
Trade	243	-0.31	-0.81	3.59	-10.08	8.615
(CDS)	243	5.96	4.94	3.51	0.07	15.41
LnCDS	243	1.55	1.60	0.84	-2.61	2.73
Elect	243	0.32	0	0.47	0	1

Part III

Signal Extraction

Chapter 6

Economic Disturbances

6.1 Introduction

Part II of this thesis looked at the cost-benefit analysis of governments to explore their motives to borrow strategically before elections. This part, part III, takes these motives as given and turns to the effectiveness of public debt as a strategic instrument. Even if governments have a motive to enhance their electoral stakes by manipulating the budget, voters may not be able to extract the competence signals governments thus try to emit.¹ This is particularly the case when there are multiple potential sources for expenditure shocks. This chapter will look at economic disturbances resulting from actors that are nonelectorally dependent, meaning that they are not (domestically) elected officials. These actors do not enter electoral competition but they contribute to a country's economic performance. They may be private investors, public regulators, firms and companies, foreign governments, or international organisations. Since these actors are not electorally accountable, voters will want to distinguish their effect on the economy from the government's individual contribution. This chapter will explore how these nonelectorally dependent decision makers inhibit the extraction of competence signals and thus dampen the political budget cycle. The following two chapters, chapters 7 and 8, will then turn to electorally dependent actors, with a particular emphasis on coalition government.²

Against the backdrop of the 2007-2010 financial and economic crisis, this chapter is topical. In response to the credit crunch in 2007, government spending and deficits have soared in most countries in order to stabilise tanking economies. In the UK, GDP growth declined from a steady 2% to 3% in the early 2000s to 0.5% in 2008 and a whopping -4.5% in 2009.³ Although this was the largest economic decline in Europe, other countries shared a similar fate. In the middle of this global economic turmoil, Germany held a general election, in September 2009. The periodical *Frankfurter Allgemeine Zeitung* drew attention to a policy enacted by the German Ministry of Health in late 2008 which would create 18,000 new jobs in nursing.⁴ The cost for this project amounted to €3.5 billion. The reporting journalist pointed out that this expenditure went largely unnoticed, primarily because it only constituted 'peanuts' given the overall spending spree that ensued in an attempt to counter

¹The theoretical models in this chapter will be based on the moral hazard model of political budget cycles which is not a signaling model like the adverse selection model, as explained in chapter 2. However, if signals are construed as information about competence that government try to convey to voters, even if it is feigned information, voters will have to extract these signals that then enter the calculus of voting. Therefore, this chapter focuses on signal extraction.

²The distinction of nonelectorally and electorally dependent decision makers is based on Duch, Raymond M. and Stevenson, Randolph T. (2008) *The Economic Vote: How Political and Economic Institutions Condition Election Results*, Cambridge: Cambridge University Press.

³See <<http://www.statistics.gov.uk/cci/nugget.asp?id=192>> - visited on 14 April 2010.

⁴Mihm, Andreas (2008) Teure Bescherung, *Frankfurter Allgemeine Zeitung*, Vol. 297, 19 December.

Germany's recession. An unnoticed policy is undoubtedly a bad instrument for governments to win votes before an election. The German nursing example suggests that electioneering may still occur in such an environment, but it is likely to be less pronounced than it would be in more economically stable periods. This chapter thus argues that economic disturbances decrease the effectiveness of debt as a strategic instrument and thus dampens the magnitude of political budget cycles.

Economic disturbances can be construed in two ways. Firstly, they can be seen as the aggregate influence on the economy, resulting from a myriad of factors influencing the real business cycle.⁵ These factors include decisions of individual households and firms, global economic shocks, technological innovation, and international trade and finance. Although each of these factors are generally associated with the actions of non-elected and elected decision makers,⁶ the result cannot easily be attributed to one specific actor. In a volatile economic environment, voters will find it increasingly difficult to extract government competence signals from shocks caused by non-elected actors. Economic volatility, as this chapter will show, thus dampens the effectiveness of public debt as a strategic instrument and thus reduces the magnitude of political budget cycles.

Economic volatility is an aggregate measure of shocks to the economy. A second way of construing economic disturbances is to look at the influence of specific actors that influence economic performance. The more economic decisions are made by non-elected actors, the more difficult it will be for voters to extract the government's contribution to economic performance, reducing the incentive to borrow strategically. This chapter will illustrate this mechanism with respect to two measures, one at the domestic and one at the international level. Domestically, the chapter will turn to the power of the national bureaucracy which assists in making economic policy but cannot be held accountable electorally. The more the bureaucracy is involved in economic decision making, the less responsibility voters will attribute to the government, thus reducing the incentive for strategic borrowing. This chapter will look at regulatory density as a proxy for the influence of the national bureaucracy on economic policy and show that the magnitude of political budget cycles decreases in the density of regulatory measures.

At the international level, non-elected actors influence domestic economic performance in particular through trade and international finance. For example, the oil shock from 1973

⁵See, e.g., Romer, David (2001) *Advanced Macroeconomics*, New York, NY: McGraw-Hill/Irwin, Chap. 4.

⁶Certainly, some types of economic shocks are not based on the decisions of human actors, such as shocks to commodity prices due to adverse weather conditions. However, to the extent that these shocks are mediated by economic actors, such shocks are not necessarily incommensurable with the argument advanced in this chapter.

was caused by a number of Arab oil producers in an attempt to discourage Western countries from supporting Israel during the Yom Kippur war. Since petroleum is the primary source of energy, industrial production in the affected countries was significantly curtailed during that period. Another example is the 2007 credit crunch which originated in the U.S. housing market but turned into a global financial and economic crisis across the world, due both to the international trading in U.S. mortgage-backed securities as well as the importance of the United States as a trading partner. The more open a country is to international trade and finance, the more economic performance is shaped by the decisions of actors that are not elected at the domestic level. Accordingly, the extraction of government competence becomes increasingly difficult with more economic openness, which, as this chapter demonstrates, in turn decreases the magnitude of political budget cycles.

Given these three different measures of 1) economic volatility, 2) regulatory density, and 3) economic openness, this chapter will show that economic disturbances limit the use of strategic debt. The predictions receive support from a large cross-section of (mainly OECD) countries for the period from 1980 until the mid 2000s. The remainder of this chapter proceeds as follows. Section two embeds the argument in the theoretical and empirical literature. Section three presents a formal model of political budget cycles conditioned by economic volatility and the number of nonelectorally dependent decision makers. The proposition derived from the model will be tested in the following three sections where section four introduces the data, section five discusses the estimation procedure and section five discusses the results. The last section concludes.

6.2 Related Literature

The literature on political budget cycles is closely linked to the one on economic voting. The gist of the economic voting literature can quite succinctly be summarised by former U.S. President Clinton's famous phrase: "It's the economy, stupid!" In other words, economic performance is a key determinant of incumbent support. The literature on political budget cycles, and in fact equally the literature on political business cycles, builds on this link between the economy and votes. If voters did not care about economic performance, Nordhaus could not have argued that politicians try to enhance their electoral stakes by boosting the economy.⁷ Rogoff and Sibert's original theory of political budget cycles is not as dependent on economic performance because they propose that voters are primarily concerned with

⁷Nordhaus, William D. (1975) The Political Business Cycle, *The Review of Economic Studies*, Vol. 42, No. 2.

government competence, which is defined as a government's fiscal efficiency rather than its impact on the real economy.⁸ However, the concept of government competence has been adapted in subsequent studies and in many instances, competence is conceived as the ability to conduct sound economic policies or to stimulate (steady) economic growth.⁹ Thus, the literature on political budget cycles is also rather closely related to the literature on economic voting.

The seminal work on economic voting were Kramer's and Fair's studies of the impact of the economy on U.S. presidential votes.¹⁰ Their work has inspired a vast amount of related studies.¹¹ However, the link between macroeconomic performance and votes for the incumbent turned out to be unstable over time.¹² Subsequent research was therefore devoted to uncovering the factors that result in this variation in economic voting. One approach was presented by Powell and Whitten, studying nineteen developed democracies.¹³ They emphasised the political and institutional context in which votes were cast and attributed particular importance to the 'clarity of responsibility', i.e. the extent to which voters could hold governments accountable for policy. Their approach was pathbreaking and emulated in numerous studies.¹⁴

The most exhaustive treatment of such context-conditional economic voting was arguably

⁸Rogoff, Kenneth and Sibert, Anne (1988) Elections and Macroeconomic Policy Cycles, *The Review of Economic Studies*, Vol. 55, No. 1. The also the model discussion in chapter 2 of this thesis.

⁹See, e.g., Alesina, Alberto and Rosenthal, Howard (1995) *Partisan Politics, Divided Government, and the Economy*, Cambridge: Cambridge University Press; Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press; Duch and Stevenson (2008) (as in n. 2).

¹⁰Kramer, Gerald H. (1971) Short-Term Fluctuations in US Voting Behavior, 1896-1964, *The American Political Science Review*, Vol. 65, No. 1; Fair, Ray C. (1978) The Effect of Economic Events on Votes for President, *Review of Economics and Statistics*, Vol. 60, No. 2.

¹¹See, e.g. Tufte, Edward R. (1978) *Political Control of the Economy*, Princeton, NJ: Princeton University Press; Markus, Gregory B. (1988) The Impact of Personal and National Economic Conditions on the Presidential Vote: A Pooled Cross-Sectional Analysis, *American Journal of Political Science*, Vol. 32, No. 1; Erikson, Robert S. (1989) Economic Conditions and the Presidential Vote, *The American Political Science Review*, Vol. 83, No. 2; Lewis-Beck, Michael S. (1990) *Economics and Elections: The Major Western Democracies*, Ann Arbor, MI: University of Michigan Press; Lewis-Beck, Michael S. and Stegmaier, Mary (2000) Economic Determinants of Electoral Outcomes, *Annual Review of Political Science*, Vol. 3, No. 1.

¹²Paldam, Martin (1991) How Robust is the Vote Function? A Study of Seventeen Nations Over Four Decades, In Norpoth, Helmut, Lewis-Beck, Michael S. and Lafay, Jean-Dominique, editors *Economics and Politics: The Calculus of Support*, Ann Arbor, MI: University of Michigan Press.

¹³Powell Jr, G.Bingham and Whitten, Guy D. (1993) A Cross-National Analysis of Economic Voting: Taking Account of the Political Context, *American Journal of Political Science*, Vol. 37, No. 2. Stigler anticipated Powell and Whitten's argument but could not present empirical evidence for his theory that emphasised the responsibility of the governing party; Stigler, George J. (1973) General Economic Conditions and National Elections, *The American Economic Review*, Vol. 63, No. 2.

¹⁴See, e.g., Anderson, Christopher J. (2000) Economic Voting and Political Context: A Comparative Perspective, *Electoral Studies*, Vol. 19, No. 2-3; Nadeau, Richard, Niemi, Richard G. and Yoshinaka, Antoine (2002) A Cross-National Analysis of Economic Voting: Taking Account of the Political Context Across Time and Nations, *Electoral Studies*, Vol. 21, No. 4; Taylor, Michael A. (2000) Channeling Frustrations: Institutions, Economic Fluctuations, and Political Behavior, *European Journal of Political Research*, Vol. 38, No. 1; Hellwig, Timothy T. (2008) Interdependence, Government Constraints, and Economic Voting, *The Journal of Politics*, Vol. 63, No. 4; Hellwig, Timothy T. (2007) Economic Openness, Policy Uncertainty, and the Dynamics of Government Support, *Electoral Studies*, Vol. 26, No. 4.

presented by Duch and Stevenson.¹⁵ Amongst other contextual features, Duch and Stevenson explore the impact of economic disturbances on the voters' ability to select a competent government. They argue that a more volatile economy blurs the government's competence signal. If voters cannot clearly infer the government's competence in economic management due to economic disturbances, economic considerations are likely to weigh less heavily in the vote decision. Duch and Stevenson base their analysis on a model of prospective voting based Alesina and Rosenthal's model of partisan cycles.¹⁶ This model is similar to competence models of political budget cycles and it also models government competence as serially dependent. However, the model does not account for information asymmetries that result in the principal-agent problems as emphasised in models of political budget cycles.¹⁷ This chapter extends Duch and Stevenson's work by introducing information asymmetries. As discussed in chapter 2.2.1. of this thesis, this assumption can be justified on empirical grounds. When there are no information asymmetries, the government is passive. In the model presented in this chapter, governments are active: they have an incentive to exploit fiscal policy to feign competence, resulting in a political budget cycle. This chapter thus takes Duch and Stevenson's argument one step further by looking at the implications for government policy.

Accordingly, the analysis below will build substantially on their work. They identify two ways of conceptualising economic disturbances. First, they look at economic volatility.¹⁸ The microfoundations of their argument build on a survey they conducted to explore what voters know about economic fluctuations. They find that voters are, indeed, aware of changes in the macroeconomy, which paves the way for exploring how these changes affect the vote choice.¹⁹ A key result from the analysis is that the economic vote for incumbents is suppressed by economic volatility since a volatile environment makes it harder for voters to extract the government's competence. A second conceptualisation of economic disturbances, that Duch and Stevenson employ, is the number of, as they term it, nonelectorally dependent decision makers. These actors do not compete in elections and thus do not factor into the vote choice. However, the more actors there are that influence economic performance, the more difficult

¹⁵Duch and Stevenson (2008) (as in n. 2); Duch, Raymond M. and Stevenson, Randolph T. (2005) Context and the Economic Vote: A Multilevel Analysis, *Political Analysis*, Vol. 13, No. 4.

¹⁶Alesina and Rosenthal (1995) (as in n. 9).

¹⁷See chapter 2.2 for a discussion of the adverse selection and moral hazard models of political budget cycles.

¹⁸Duch and Stevenson (2008) (as in n. 2), p. 158. See also Quinn, Dennis P. and Woolley, John T. (2001) Democracy and National Economic Performance: The Preference for Stability, *American Journal of Political Science*, Vol. 45, No. 3.

¹⁹Sanders also argues that voters are aware of general movements in economic activity, even if they may not know specific economic 'facts'; Sanders, David (2000) The Real Economy and the Perceived Economy in Popularity Functions: How Much do Voters Need to Know? A Study of British Data, 1974-97, *Electoral Studies*, Vol. 19, No. 2-3.

it is for voters, again, to disentangle the individual contribution of the government. Thus, the more non-elected decision makers there are, the smaller will be the economic vote.

This chapter follows these two distinct conceptualisations. First, the analysis will turn to economic volatility. Second, the analysis will look at the number of nonelectorally dependent decision makers. Duch and Stevenson look at different ways of defining these. For this thesis, their emphasis on the size of the national bureaucracy and the openness of the economy seem particularly relevant. With respect to the former, Duch and Stevenson argue that “[a]s regulatory oversight of the private sector grows and becomes more complex, elected officials delegate increasing amounts of authority to nonelected regulatory agents.”²⁰ For this reason, competence shocks could equally come from the non-elected bureaucracy rather than the elected policy-makers, thus decreasing the economic vote. With respect to economic openness, Duch and Stevenson argue that the free flow of capital reduces governments’ ability to use monetary and fiscal policy freely, thus limiting their impact on the real economy. Trade, they argue, can result in spill-over effects from global demand shocks into the national economy, thus creating other influences on economic performance beyond the control of the government.²¹ This chapter will extend this work by examining how these findings for economic voting translate into governments’ incentives to borrow strategically.

The chapter does not constitute the first attempt to examine how these factors influence political budget cycles. Kayser examines a trade-off between governments’ incentives to call early elections and to manipulate fiscal policy.²² His model predicts that economic volatility dampens fiscal manipulation, i.e. strategic deficits, in favour of early elections. However, the model does not explicitly model the signal extraction problem voters face when dealing with both competence and economic shocks and Kayser does not pay any attention to nonelectorally dependent decision makers - and he does not subject his model’s predictions to empirical tests. The insights generated in this chapter are thus complementary to his work and largely novel. Clark and Hallerberg show that the exchange rate regime, jointly with central bank independence, moderates the magnitude of political budget cycles.²³ Their emphasis differs from the one employed in this chapter in that they do not at all look at the problem of signal extraction, but only at the feasibility of policy under different institutional

²⁰Duch and Stevenson (2008) (as in n. 2), p. 194.

²¹For a related argument see Hellwig (2007) *Electoral Studies* (as in n. 14); Hellwig, Timothy T. and Samuels, David (2007) Voting in Open Economies: The Electoral Consequences of Globalization, *Comparative Political Studies*, Vol. 40, No. 3.

²²Kayser, Mark Andreas (2005) Who Surfs, Who Manipulates? The Determinants of Opportunistic Election Timing and Electorally Motivated Economic Intervention, *The American Political Science Review*, Vol. 99, No. 1.

²³Clark, William Roberts and Hallerberg, Mark (2000) Mobile Capital, Domestic Institutions, and Electorally Induced Monetary and Fiscal Policy, *The American Political Science Review*, Vol. 94, No. 2.

settings. The analysis below will thus complement their findings from a different angle.

6.3 Theory

The model derived in this section will include elements of the Duch and Stevenson model, discussed above, into the moral hazard competence model which was developed by Persson and Tabellini and modified by Shi and Svensson, and which also formed the theoretical basis for the previous two chapters.²⁴ As in their models, voter i 's utility can be expressed as follows:

$$U_s^i = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + \theta^i z_s] \quad (6.1)$$

where β is a discount factor which is assumed to be one. Voters are assumed to have a non-economic bias toward either the incumbent or the challenger which is represented by the term $\theta^i z$, where $z = \{-\frac{1}{2}, \frac{1}{2}\}$ respectively for the incumbent party and the challenger. Moreover, $\theta^i \sim \text{unif}[-\frac{1}{2} + \nu; \frac{1}{2} + \nu]$, where $\nu \in [-\frac{1}{2}, \frac{1}{2}]$. The parameter ν is exogenously determined and reflects the challenger's popular advantage on non-economic policy; that is *higher* values of ν represent a *lower* non-economic popularity of the incumbent party. $u(c)$ represents the utility for consumption where consumption c is:

$$c_t = y - \tau_t \quad (6.2)$$

where y is income and τ is the tax rate. Note that taxes are lump sum and do not change proportionally with income. Politician' j s utility is:

$$U_s^j = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + X]; \quad j = \{a, b\} \quad (6.3)$$

where X indicates ego-rents. The incumbent is labeled as a and b is the challenger. Government expenditure g is given by:

$$g_t = \tau_t + d_t - R(d_{t-1}) + \eta_t^j + \sum_{l=1}^{\xi} \epsilon_{lt} \quad (6.4)$$

where τ is tax revenue and d is the deficit. $R(d)$ is the cost of the deficit, for which it is

²⁴Duch and Stevenson (2008) (as in n. 2); Persson and Tabellini (2000) (as in n. 9); Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9.

assumed that $R(0) = 0$, $R'(d) > 0$, $R'(0) \geq 1$, and $R''(d) > 0$. Government competence is given, as in the previous chapter, by η , which is modeled as a sequence of individual competence shocks, μ :

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j, \quad j = \{a, b\} \quad (6.5)$$

The model differs from the ones in the previous chapters by introducing an additional disturbance, the economic shock ϵ . This shock represents decisions made by nonelectorally dependable actors. There are $\xi \in \mathbb{N}$ such actors in the economy, each adding to the overall economic shock.²⁵ The values for both economic shocks, ϵ , and competence shocks, μ , are distributed identically and independently (*iid*) with zero mean and finite variance:

$$k_t = \mu_t^j + \sum_{l=1}^{\xi} \epsilon_{lt} \stackrel{iid}{\sim} N(0, \sigma_\mu^2 + \xi \sigma_\epsilon^2) \quad (6.6)$$

The sum of the random shocks, k , has a distribution function $F(k)$ and a density function $f(k)$. Equilibrium deficit in off-election years is zero since the marginal utility of public consumption is constant at one ($g'(d) = 1$) and the marginal cost of borrowing is greater or equal than one and increasing when the deficit exceeds zero ($R'(0) \geq 1$; $R''(0) > 0$). Accordingly, the cost of servicing outstanding debt is zero. The equilibrium tax rate τ^* is determined by maximising the government's utility:

$$\max_{\tau} \quad E_t[g_t + u(c_t) + X] \quad (6.7)$$

$$s.t. \quad g_t = \tau_t + \eta_t + \sum_{l=1}^{\xi} \epsilon_{lt} \quad (6.8)$$

The solution to this maximisation problem, solving for the equilibrium tax rate τ^* , is:²⁶

$$\tau_t = \tau^* = y - u_c^{-1}(1) \quad (6.9)$$

where $\tau = \tau^*$ and is the same for both the incumbent a and challenger b . The two candidates will set the same tax rate, however they differ in their competence in delivering public goods given the revenue they collect. Indifferent voters will vote for the candidate that is expected to be more competent. In the case of candidate b , the challenger, voters have no information

²⁵This approach differs from the Duch and Stevenson model in that their model looks at the number of decisions rather than the number of actors. Looking at the number of actors is conceptually similar, however, it simplifies the exposition by keeping the number of electorally dependent decision makers fixed at one, the government.

²⁶The solution to this maximisation problem is equivalent to that in chapter 5 and will thus be omitted here.

about competence. They will thus form their expectations on the mean value of μ which is zero. From equations 6.4 and 6.5, expected government expenditure of candidate b in the next period, $t + 1$ is thus:

$$E_t[g_{t+1}^b] = \tau^* - E_t[R(d_t^*)] \quad (6.10)$$

where d^* is the equilibrium deficit in the election year, yet to be derived. The expected government expenditure for the incumbent a can be derived in a similar way, except that voters observe the government's competence in period $t - 1$.

$$E_t[g_{t+1}^a] = \tau^* - E_t[R(d_t^*)] + E_t[\mu_t^a|k] \quad (6.11)$$

Voter i will vote for candidate a if:²⁷

$$E_t[\mu_t^a|k] - \theta^i \geq 0 \quad (6.12)$$

The probability that voter i will vote for candidate a can thus be calculated as follows:

$$Pr(E_t[\mu_t^a|k] - \theta^i \geq 0) = E_t[\mu_t^a|k] + \frac{1}{2} - \nu \quad (6.13)$$

The expectation of the government's competence shock conditional on the overall shock, $E[\mu_t^a|k]$ can be calculated with reference to Duch and Stevenson:²⁸

$$\begin{aligned} E_t[\mu_t^a|k] &= \rho_{\mu_t^a k} \frac{k - E[k]}{\sigma_k} \sigma_{\mu^a}^a + E[\mu_t^a] \\ &= \left(\frac{\sigma_{\mu^a}^2}{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2} \right) (g_t - \tau^* - d_t - \mu_{t-1}^a) \end{aligned} \quad (6.14)$$

Since voters cannot observe the deficit, their best guess of the overall expected competence shock to public expenditure, $E[\widehat{\mu^a}|k]$, can be calculated as follows:

$$E_t[\widehat{\mu^a}|k] = \left(\frac{\sigma_{\mu^a}^2}{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2} \right) (g_t - \tau^* - \hat{d}_t - \mu_{t-1}^a) \quad (6.15)$$

Substituting equations 6.4 and 6.5 into equation 6.15 yields:

$$E_t[\widehat{\mu^a}|k] = \left(\frac{\sigma_{\mu^a}^2}{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2} \right) (\mu_t^a + \epsilon_t + d_t - \hat{d}_t) \quad (6.16)$$

²⁷Deriving this equation is analogous to the corresponding equation in chapter 5.

²⁸Duch and Stevenson (2008) (as in n. 2), p. 142.

From equations 6.13 and 6.16, the probability P that candidate a receives at least 50% of the votes can be expressed as:

$$\begin{aligned} P_t &= Pr \left(\left(\left(\frac{\sigma_{\mu^a}^2}{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2} \right) (\mu_t^a + \epsilon_t + d_t - \hat{d}_t) + \frac{1}{2} - \nu \right) \geq \frac{1}{2} \right) \\ &= 1 - F \left((\hat{d}_t - d_t) + \left(\frac{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2}{\sigma_{\mu^a}^2} \right) \nu \right) \end{aligned} \quad (6.17)$$

The government then maximises its expected utility for periods t and $t + 1$.

$$\begin{aligned} \max_d \quad & E_t[\tau^* + d_t + \eta_t^a + u(y - \tau^*) + X] \\ & + E_t[(1 - F \left((\hat{d}_t - d_t) + \left(\frac{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2}{\sigma_{\mu^a}^2} \right) \nu \right) \\ & * (\tau^* - R(d_t) + \eta_{t+1}^a + u(y - \tau^*) + X)] \\ & + E_t[F \left((\hat{d}_t - d_t) + \left(\frac{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2}{\sigma_{\mu^a}^2} \right) \nu \right) \\ & * (\tau^* - R(d_t) + \eta_{t+1}^b + u(y - \tau^*)))] \end{aligned} \quad (6.18)$$

The first order condition for this maximisation problem is:

$$1 + f \left((\hat{d}_t - d_t) + \left(\frac{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2}{\sigma_{\mu^a}^2} \right) \nu \right) X - R'(d_t) = 0 \quad (6.19)$$

In equilibrium the incumbent's choice of the deficit d^* must be consistent with the voters' expectations. Thus in equilibrium $d^* = \hat{d}_t = d_t$. This means that voters fully understand the government's incentives and correctly anticipate any electoral changes in the deficit. Given the assumptions about the function F , the first order condition in equation 6.19 must hold in equilibrium:

$$1 + f \left(\left(\frac{\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2}{\sigma_{\mu^a}^2} \right) \nu \right) X - R'(d^*) = 0 \quad (6.20)$$

Total differentiating the first order condition yields the following comparative static for *economic volatility*, σ_{ϵ}^2 :²⁹

$$\frac{\partial d^*}{\partial \sigma_{\epsilon}^2} < 0 \quad (6.21)$$

Analogously, for the *number of nonelectorally dependable actors*, ξ , total differentiating yields:

$$\frac{\partial d^*}{\partial \xi} < 0 \quad (6.22)$$

²⁹The comparative statics for this chapter are derived in the appendix.

These findings can be summarised in the following propositions

Proposition 6.1. *Comparative statics of equilibrium pre-electoral deficit*

- a) The equilibrium deficit, d^* , decreases as the variance of economic shocks, σ_e^2 , increases.
- b) The equilibrium deficit, d^* , decreases as number of nonelectorally dependent decision makers, ξ , increases.

To summarise the intuition of the model, economic disturbances blur responsibility for variations in government output: an increase in output could result from an increase in government competence as well as from an economic shock over which the government had no control. A government that wishes to take advantage of asymmetric information over the deficit in order to fool voters into believing that an increase in expenditure results from higher administrative efficiency, has a lower incentive to do so if it is less likely to be rewarded at the polls. Borrowing is costly and it is only rational for governments to feign competence if the vote gain offsets this cost. Economic volatility, and the number of non-elected economic actors, decrease economic voting and the relative cost of electoral manipulation increases. Therefore, political budget cycles are less likely to emerge in an economically volatile environment, or an environment characterised by many nonelectorally dependent decision makers. The next two sections will deal with the empirical tests of this proposition.

6.4 Data

The dependent variable for the analysis is the fiscal deficit. The standard operationalisation is the budget balance as a percentage of GDP. As in chapter 5, data were obtained from the *2009 World Economic Outlook*, published by the International Monetary Fund (IMF). Data are available for the period 1980 until 2008, however time series differ in length for individual countries, the panel is thus unbalanced. Deficit data are available mostly for developed democracies.

The key independent variable for the analysis are measures of economic disturbances. The first measure, which will be used to test proposition 6.1a), is economic volatility, *Ln Variance*. For this analysis, it was constructed by calculating the variance in quarterly, seasonally

adjusted, economic growth over two years. The growth data were obtained from the World Bank's *World Development Indicators*. It is a judgment call as to how many observations to include in calculating the variance in economic growth. Two years, i.e. eight quarters, seem a reasonable period. The two-year period corresponds closely to the theoretical model which assumes the persistence of competence shocks for two periods. It should therefore be an appropriate measure to test the proposition derived from the model and will therefore be the operationalisation used in the analysis.³⁰ The volatility data are heavily skewed which is why the variable will be used as a function of natural logarithms. Data availability allows for the inclusion of 26 countries.³¹

Two measures for the number of nonelectorally dependent decision makers will be employed to test proposition 6.1b). First, the analysis will follow Duch and Stevenson and include a measure of regulatory density, *Regulate*, developed by Gwartney and Lawson.³² They construct an index ranging from 1 to 10 where higher values indicate a higher value of regulatory density.³³ Data for this index are available from 1980 until 2007 and allow for the inclusion of 26 countries in the analysis.³⁴ Second, to measure economic openness, *Open*, the analysis will depart from Duch and Stevenson. Their measure is based on World Bank data of total trade as a percentage of GDP. This emphasis on trade seems to be too restrictive. The credit crunch of 2007 which spread like wildfire across countries demonstrates vividly how important international finance is to economic performance. International investment should thus not be omitted from a measure of economic openness. The analysis below will thus employ an index constructed primarily by Dreher.³⁵ His index combines information on trade and financial openness and it thus more suited for the analysis than a simple measure of trade volume.³⁶ The data are available from 1980 until 2007. 25 countries can be included

³⁰This theoretical justification aside, there are also few practical alternatives to this measure. A one-year window does not contain sufficient quarterly data to calculate a meaningful measure of volatility. Monthly growth data would be valuable information but such data are not widely available. A possible alternative measure is the variance in growth from a three-year window. This measure was calculated to check the robustness of the findings. All results from the analysis below are robust to this alternative operationalisation.

³¹The countries included in the analysis are: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

³²Gwartney, James and Lawson, Robert (2009) *Economic Freedom of the World: 2009 Annual Report*, Fraser Institute (URL: <http://www.freetheworld.com>) – visited on 16 May 2010.

³³The index includes the following categories: price controls; administrative requirements; bureaucracy cost; licensing restrictions; cost of tax compliance; business regulations.

³⁴The countries included in the analysis are: Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

³⁵Dreher, Axel (2007) Does Globalization Affect Growth? Evidence from a New Index of Globalization, *Applied Economics*, Vol. 38, No. 10. See also Dreher, Axel, Gaston, Noel and Martens, Pim (2008) *Measuring Globalisation: Gauging its Consequences*, New York, NY: Springer Verlag.

³⁶More precisely, the index measures measures trade, foreign direct investment and portfolio investment

in the analysis.³⁷

The second key variable is the election dummy, which was constructed in the same way as in chapter 5: it is based on data from the World Bank's 2008 edition of the *Database of Political Institutions*³⁸ and was manually extended up to the year 2008. In specifying control variables, the analysis will follow the specifications of other, similar, studies, in particular those of Shi and Svensson.³⁹ It will include the log of GDP per capita and a measure of economic growth. The variation in economic volatility may be an artefact of the business cycle; for this reason a measure of two-year economic growth will also be included which corresponds to the time interval which the volatility variable is constructed for. All three control variables are based on GDP data from the IMF's *2009 World Economic Outlook*. Descriptive statistics for all variables can be found in the appendix.

All countries included are members of the Organisation of Economic Cooperation and Development (OECD) and thus comparatively wealthy and may limit the extent to which the finding can be generalised, in particular to developing countries. However, the sample does include some of the countries that Brender and Drazen label 'new' democracies (notably Greece, Portugal, Spain, Korea, as well as the Czech Republic and Slovakia).⁴⁰ Developing countries are often characterised by higher growth which is correlated with higher economic volatility. Excluding these countries will serve to verify the robustness of the volatility results and their applicability to 'old' democracies. The literature shows that political budget cycles are particularly pronounced in developing countries⁴¹ and 'new' democracies.⁴² Since the sample is largely based on developed countries and 'old' democracies, the analysis is arguably conducted in the most 'adverse' scenario - but conversely supportive results will strengthen the argument considerably.

6.5 Estimation

Proposition 6.1 will be tested in a pooled time series-cross section analysis. The empirical

(all in percent of GDP). Income payments to foreign nationals and capital employed (in percent of GDP) are included to proxy for the extent a country employs foreign people and capital in its production processes. Dreher (2007) (as in n. 35), p.1095.

³⁷The countries included are largely identical with the ones included for the regulation index. Yet data are not available for Cyprus, Slovenia, and Israel. They are, however, available for the Czech Republic and the Slovak Republic.

³⁸Beck, Thorsten et al. (2001) New Tools in Comparative Political Economy: The Database of Political Institutions, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

³⁹Shi and Svensson (2006) *Journal of Public Economics* (as in n. 24).

⁴⁰Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

⁴¹Shi and Svensson (2006) *Journal of Public Economics* (as in n. 24).

⁴²Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 40).

model to be estimated can be expressed as follows:

$$\begin{aligned}
 F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 DISTURB_{i,t} \\
 & + \beta_4 ELECT_{i,t} * DISTURB_{i,t} + \gamma' \mathbf{X}_{i,t} + \eta_i + \lambda_t + \nu_{i,t}
 \end{aligned} \tag{6.23}$$

, where $i = 1, 2, \dots, N$ and $t = 1, \dots, T$. $F_{i,t}$ is the indicator of fiscal policy, which in this case is the budget balance. As in the previous chapters, this means that *negative* values of the dependent variable indicate a budget deficit. *ELECT* is a dummy variable indicating whether an election took place in year t . *DISTURB* represents the different measures of economic disturbances: economic volatility, the regulation index, and the index of economic openness. The main interest of the empirical analysis lies with the coefficients on the variable *ELECT* and the interaction of *ELECT* and *DISTURB*. The overall effect is expected to be negative, since elections cause a decrease in the budget balance, but increasing in the disturbance measures due to the weakening of competence signals.

Apart from these main variables of interest the statistical model will include a lagged dependent variable, $F_{i,t-1}$ to model the underlying dynamics of the dependent variable. The economic control variables are included in the vector $\gamma' \mathbf{X}_{i,t}$. The parameters η_i and λ_t are the country and time specific error terms while $\nu_{i,t}$ indicates the overall error.

Data for the budget balance are available for 28 years which means that the length of the time series employed in the analysis is rather short. In this light, the consequences for the statistical estimation are essentially identical to the problems encountered in the previous chapters. Estimating the model with fixed effects (FE) allows to account for the heterogeneity across countries. However, FE combined with a lagged dependent variable can result in significant bias.⁴³ In chapter 5.5, where the data structure was particularly similar to the one employed in this chapter, it was argued that the system-GMM estimator, as conceived jointly by Arellano, Bond, Blundell, and Bover, is particularly suitable for the estimation.⁴⁴ The analysis below will thus use this estimator, in the same way as in the previous chapter.⁴⁵ Again, the analysis below closely follows Bond's recommendations on

⁴³Nickell, Stephen J. (1981) Biases in Dynamic Models with Fixed Effects, *Econometrica: Journal of the Econometric Society*, Vol. 49, No. 6.

⁴⁴Arellano, Manuel and Bond, Stephen (1991) Some Tests of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, Vol. 58, No. 2; Arellano, Manuel and Bover, Olympia (1995) Another Look at the Instrumental Variables and GMM: Estimation and Testing, *Stata Journal*, Vol. 3, No. 1; Blundell, Richard and Bond, Stephen (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 87, No. 1.

⁴⁵This also means that, time dummies will be included to control for contemporaneous correlation which is assumed to be absent in the GMM specification. Moreover, based on Bowsher's recommendations, the

Table 6.1: Economic volatility and political budget cycles

Dep. variable	Budget balance					
Model	(1)	(2)	(3)	(4)	(5)	(6)
Method	Pooled	FE	GMM	Pooled	FE	GMM
Balance (L1)	0.93*** (0.03)	0.78*** (0.04)	0.83*** (0.06)	0.93*** (0.03)	0.79*** (0.04)	0.83*** (0.06)
Growth (1 year)	0.28*** (0.11)	0.15 (0.12)	0.21** (0.13)	0.28*** (0.11)	0.16 (0.12)	0.20** (0.10)
Growth (2 year)	0.02 (0.06)	0.13* (0.07)	0.14* (0.09)	0.02 (0.06)	0.13 (0.08)	0.13* (0.08)
LnGDP	0.24 (0.20)	-0.11 (1.00)	-0.50 (0.57)	0.28 (0.20)	-0.19 (1.02)	-0.40 (0.59)
LnVariance	-0.10* (0.06)	-0.13 (0.09)	-0.07 (0.13)	-0.17*** (0.06)	-0.18 (0.10)	-0.14 (0.12)
Elect	-0.35* (0.18)	-0.38** (0.13)	-0.37*** (0.15)	-0.09 (0.24)	-0.20 (0.17)	0.05 (0.20)
Elect x LnVariance				0.24** (0.10)	0.16** (0.08)	0.33** (0.14)
AR(1) ^(a)			-3.64 (0.00)			-3.51 (0.00)
AR(2) ^(a)			-1.25 (0.21)			-1.40 (0.16)
No. countries	26	26	26	26	26	26
No. obs	486	486	486	486	486	486

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses. Time dummies are included but not reported. (a) z-values;
p-values in parentheses.

implementing the GMM estimator.⁴⁶ The tables presenting the main results will thus also include the pooled and FE estimates. If correctly implemented, the estimate for the lagged dependent variable will lie between the pooled and FE estimates. The tables also report the AR1 and AR2 statistics for the first-differenced residuals. If the instruments are valid, there will be first-order but no second-order autocorrelation.

6.6 Results

Table 6.1 presents the results of the statistical analysis with respect to economic volatility. Columns one and two present the results for the election dummy in the pooled and Fixed Effects analyses respectively. Column three presents the GMM result. As expected, the coefficient for the lagged dependent variable in the GMM specification lies in between the

number of lags will be reduced. Lastly, Windmeijer's correction for small samples will be implemented. See Bowsher, Clive G. (2002) On Testing Overidentifying Restrictions in Dynamic Panel Models, *Economics Letters*, Vol. 77; Windmeijer, Frank (2005) A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators, *Journal of Econometrics*, Vol. 126, No. 1.

⁴⁶Bond, Stephen R. (2002) Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice, *Portuguese Economic Journal*, Vol. 1, No. 2.

pooled and FE estimates, suggesting that the model is correctly specified. Moreover, there is first order autocorrelation in the first-differenced errors. This happens by construction due to first-differencing. There is no second-order autocorrelation in the differenced residuals (which would invalidate the instruments). The election dummy is negatively signed, as expected, and significant. It indicates that the budget balance decreases by 0.37 percentage points in election years. The magnitude of the political budget cycle is thus considerable.⁴⁷

Columns four, five, and six repeat the analysis including the interaction effect between the election dummy and the logged variance variable. Again, the model seems correctly specified: the GMM estimate of the lagged dependent variable in column six lies between the estimates for the pooled model (column four) and the FE model (column five). The autoregressive structure also suggests that the model is correctly specified. The interaction effect is statistically significant at the 5% level; its positive sign conforms with expectations: the larger the degree of economic volatility, the smaller is the effect of election years on the budget balance. To test the joint significance of the effect of election years of the budget balance, table 6.4 calculates the marginal effect of the election variable at different levels of economic volatility: at the first quartile (including the lowest 25% of the data, p25), the median (p50) and the third quartile (p75). Table 6.4 shows that the effect in model six is statistically significant both at the median level and the lower quartile. It is not significant at the upper quartile where volatility is particularly strong. The results are supportive of proposition 6.1a) and indicate that at very high levels of volatility the political budget cycle is virtually zero and picks up in magnitude at lower levels of volatility. In the lower quartile of the volatility data the budget balance decreases by 0.6% of GDP, a considerable effect.

Tables 6.2 and 6.3 present the analysis with reference to nonelectorally dependent decision makers. Table 6.2 includes the regulation index. As in table 6.1, table 6.2 first presents the model without the interaction effect. Looking at the diagnostics, the model is correctly specified. The lagged dependent variable in column three (model 10) lies in between the estimates from the pooled and FE regressions in the first two columns. The autocorrelation structure also suggests that the instruments are valid, even though the p-value for the AR2 structure is relatively low. The effect of the election dummy on the budget balance in the GMM model in column three is -0.51. This effect is statistically significant at the 5% level, indicating that a political budget cycles can be detected in these countries. The regulation index on its own is not statistically significant in either of the first three columns.

⁴⁷The median budget balance in the sample is -1.78. A change from -1.78 to $(-1.78 - 0.37) = -2.15$ constitutes a 20% increase in the budget deficit measured as a percentage of GDP.

Table 6.2: Regulation and political budget cycles

Dep. variable	Budget balance					
Model	(7)	(8)	(9)	(10)	(11)	(12)
Method	Pooled	FE	GMM	Pooled	FE	GMM
Balance (L1)	0.86*** (0.03)	0.75*** (0.05)	0.77*** (0.07)	0.86*** (0.03)	0.75*** (0.05)	0.77*** (0.08)
Growth (1 year)	0.23*** (0.04)	0.25*** (0.05)	0.30*** (0.07)	0.23*** (0.04)	0.25*** (0.05)	0.29*** (0.06)
LnGDP	0.53** (0.28)	-0.24 (0.68)	-0.04 (1.48)	0.53** (0.27)	-0.24 (0.69)	-0.10 (1.49)
Elect	-0.34** (0.16)	-0.41* (0.21)	-0.51** (0.23)	-4.48** (2.03)	-4.41 (2.86)	-6.11*** (2.00)
Regulate	-0.03 (0.19)	0.06 (0.29)	-0.20 (0.44)	-0.08 (0.20)	0.00 (0.29)	-0.27 (0.40)
Elect x Regulate				0.57** (0.27)	0.55 (0.38)	0.77*** (0.26)
AR(1) ^(a)			-3.08 (0.00)			-3.09 (0.00)
AR(2) ^(a)			-1.52 (0.13)			-1.28 (0.20)
No. countries	26	26	26	26	26	26
No. obs	613	613	613	613	613	613

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses. Time dummies are included but not reported. (a) z-values; p-values in parentheses.

Columns four through six of table 6.2 include the interaction term between the regulation index and the election dummy. As expected, the interaction terms are positively signed and statistically significant. In the Pooled model, the term is significant at the 5% level and in the GMM model at the 1% level. In the FE model it is not significant. This may partly be due to the fact that the index only varies every five years between 1980 and 2000. Mean-differencing the variable thus wipes out some of the variation in the variable which may explain the insignificant coefficient. The marginal effect from the GMM estimation can, again, be found in table 6.4. The effect is negative and statistically significant for all three percentiles listed in the table, and the effect of election years on the budget balance decreases from -0.23 when regulation is high (p75) to -1.03 (p25) when regulation is low. This provides empirical support for proposition 6.1b).

Lastly, table 6.3 includes the third and last economic disturbance measure: economic openness. Looking at the diagnostics suggests, again, that the GMM model in column three is correctly specified. The first three columns do not include the interaction term. The election dummy is of a similar magnitude and significance as the previous two tables, which is not surprising given the strong overlap of countries. The openness measure on its own is

Table 6.3: Economic openness and political budget cycles

Dep. variable	Budget balance					
Model	(13)	(14)	(15)	(16)	(17)	(18)
Method	Pooled	FE	GMM	Pooled	FE	GMM
Balance (L1)	0.87*** (0.03)	0.78*** (0.04)	0.82*** (0.07)	0.87*** (0.03)	0.78*** (0.04)	0.82*** (0.07)
Growth (1 year)	0.22*** (0.04)	0.27*** (0.06)	0.26*** (0.07)	0.22*** (0.04)	0.27*** (0.06)	0.26*** (0.07)
LnGDP	0.47 (0.28)	-0.64 (0.60)	-0.79 (0.49)	0.48* (0.28)	-0.61 (0.62)	-0.78 (0.49)
Elect	-0.42*** (0.13)	-0.41*** (0.13)	-0.41*** (0.14)	-1.80** (0.77)	-1.61** (0.62)	-1.93** (0.67)
Open	0.01 (0.01)	0.00 (0.02)	-0.04 (0.04)	0.00 (0.01)	0.00 (0.02)	0.00 (0.03)
Elect x Open				0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
AR(1) ^(a)			-3.72 (0.00)			-3.71 (0.00)
AR(2) ^(a)			-1.36 (0.17)			-1.27 (0.21)
No. countries	25	25	25	25	25	25
No. obs	604	604	604	604	604	604

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses. Time dummies are included but not reported. (a) z-values; p-values in parentheses.

not significant.

Columns four to six include the interaction term between the measure of economic openness and the election dummy. The individual effect of the election dummy differs across these columns, but the interaction term is of the same magnitude (0.02) and consistently statistically significant at the 5% level. The positive sign indicates that political budget cycles decrease in magnitude as the economy is more open. Table 6.4 illustrates this relationship. The effect changes from -0.59 at the lowest quartile (p(25)) to -0.19 at the highest quartile (p(75)). For the lower two percentiles listed in the table (p(25) and p(50)), the effect is statistically significant at the 1% level. Economic openness thus clearly dampens political budget cycles, as posited by proposition 6.1b).

Figures 6.3 illustrate the marginal effects of election years on the budget balance conditioned on economic volatility, the regulation index, and the economic openness index respectively.⁴⁸ The solid line represents the marginal effect and the dashed lines represent 95% confidence intervals. The figures illustrate that for all three conditioning variables the effect is positive which means that the budget balance increases at higher values of the con-

⁴⁸The figures is based on Brambor, Thomas, Clark, William R. and Golder, Matt (2006) Understanding Interaction Models: Improving Empirical Analyses, *Political Analysis*, Vol. 14, No. 1.

Table 6.4: Marginal effects

Model		(6)	(13)	(19)
Sample		Full	Full	Full
Marginal effect		LnVariance	Regulate	Open
Percentile of conditioning variable	p(75)	-0.06 (0.17)	-0.23* (0.14)	-0.19 (0.16)
	p(50)	-0.36*** (0.13)	-0.55*** (0.19)	-0.67*** (0.14)
	p(25)	-0.60*** (0.18)	-1.03*** (0.32)	-0.59*** (0.16)

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses

ditioning variables. Conversely it means that the deficit decreases as these values increase. This provides support for proposition 6.1: more economic disturbances decrease the use of strategic debt.

One important robustness check was based on Brender and Drazen's argument that political budget cycles are driven by the experience of 'new democracies'.⁴⁹ Excluding the countries Brender and Drazen classify as new democracies does weaken the magnitude of the marginal effects slightly, but the results maintain their statistical significance. To consider the robustness of the findings further, when including variables from all chapters in this thesis, chapter 9 provides a comprehensive analysis. Some of the results (with respect to economic volatility and openness) are weakened in chapter 9, however, this is likely due to a smaller sample size. Thus, proposition 6.1. is still supported rather well by the data.

⁴⁹Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 40).

Figure 6.1: Marginal effect: Elections and economic volatility

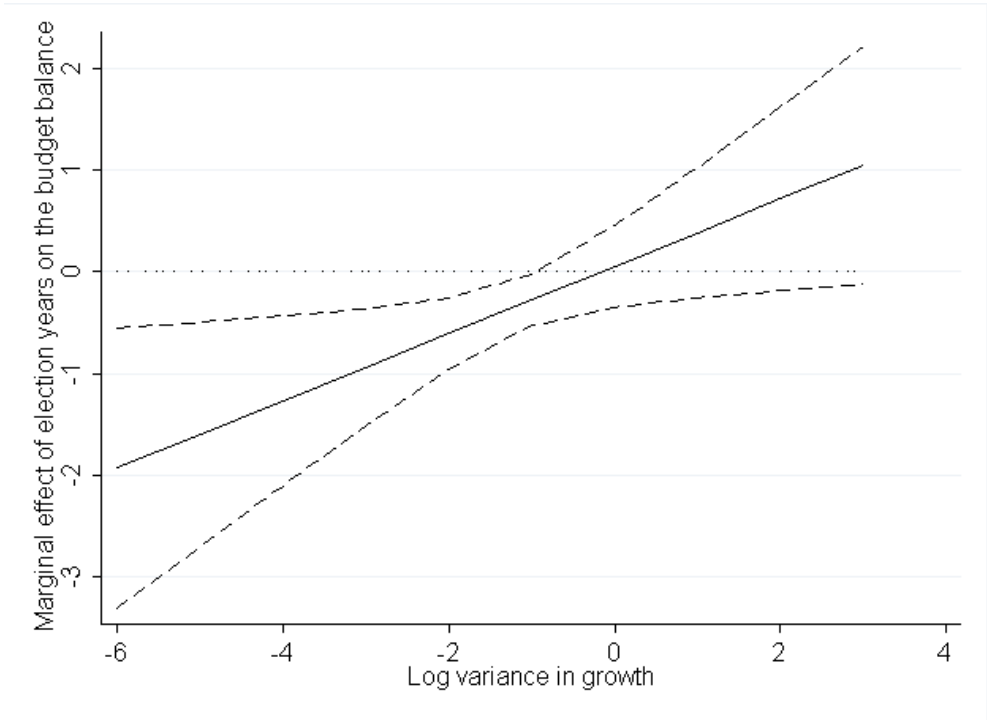


Figure 6.2: Marginal effect: Elections and regulation

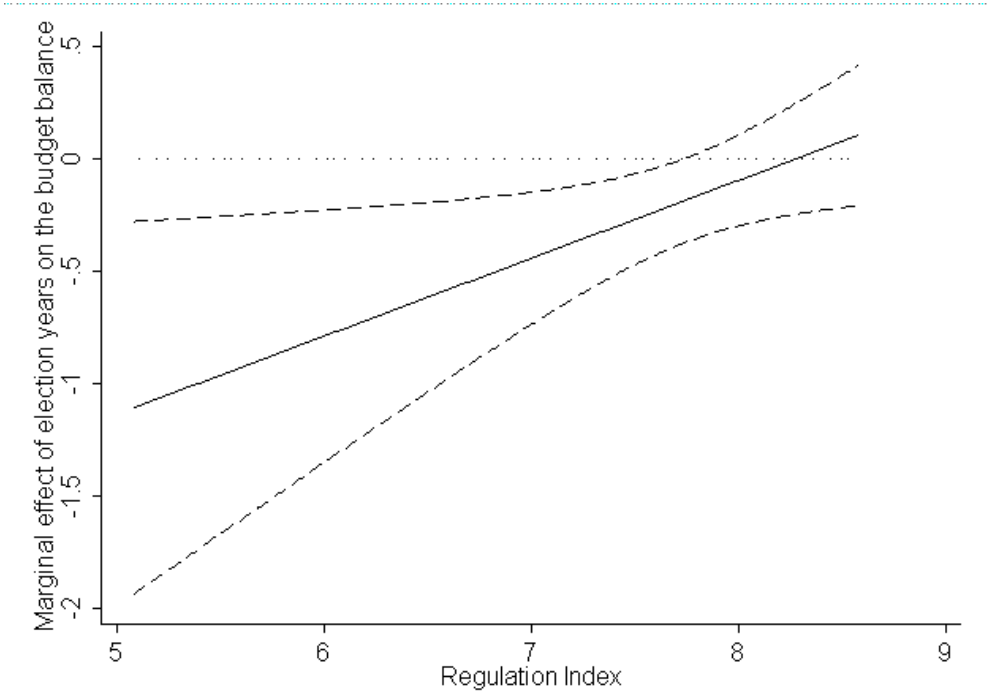
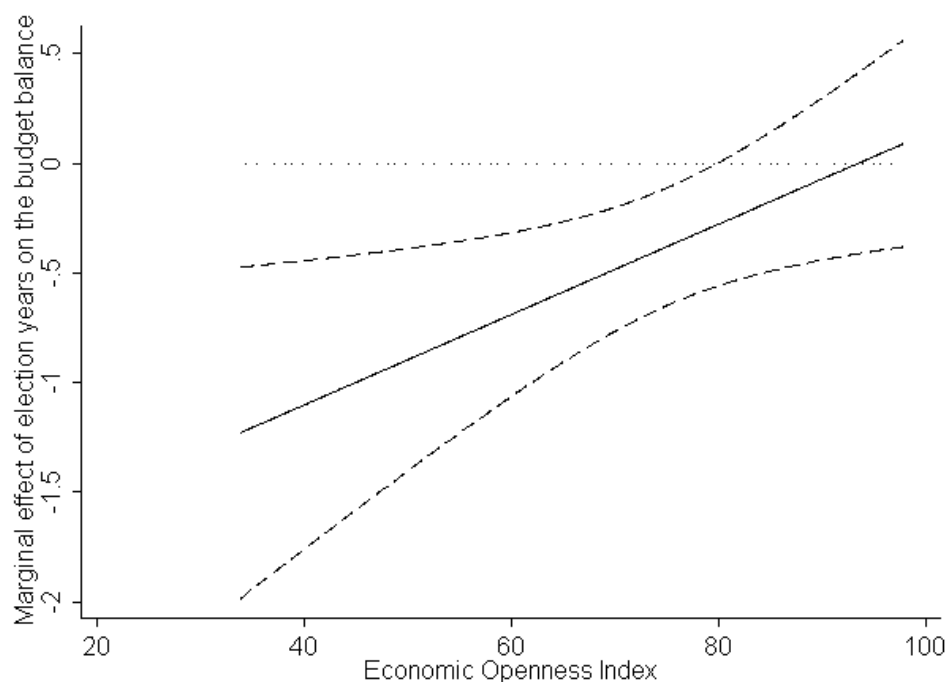


Figure 6.3: Marginal effect: Elections and economic openness



6.7 Conclusion

Faced with economic disturbances, what are governments' incentives to feign competence before an election? This chapter has argued that in such an environment these incentives are comparatively small. As the literature on economic voting has determined, economic disturbances make it harder for voters to determine whether increases in government output are due to a positive economic shock or, indeed, to an increase in the government's administrative efficiency. The uncertainty surrounding competence shocks in this setting thus reduces the degree of economic voting. Building on the insights gained from this literature, this chapter takes the argument from voting to government behaviour.

The chapter has looked at two different aspects of economic disturbances: economic volatility and the influence of nonelectorally dependent decision makers. The latter was operationalised in two ways, once with respect to regulatory density and once with respect to economic openness. All these factors blur the government's competence signal and thus decrease the incentive to borrow before elections. It was shown that the empirical evidence strongly supports this proposition.

6.8 Appendix

6.8.1 Theoretical

Comparative statics

The comparative statics can be derived easily from the equilibrium condition in equation 6.20. Since the function $f(\cdot)$ is a normal probability density function, total differentiating equation 6.20 with respect to economic variance, $\sigma_{\epsilon^a}^2$, yields:

$$\frac{\partial d^*}{\partial \sigma_{\epsilon}^2} = -\frac{1}{4} \frac{\xi e^{-\frac{\nu^2(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2)}{2\sigma_{\mu^a}^2}} \sqrt{2}(\nu^2(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2) + \sigma_{\mu^a}^4)X}{\sqrt{\pi}[\sigma_{\mu^a}^4(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2)^{\frac{3}{2}} R''(d^*)]} < 0 \quad (6.1)$$

It is easy to see that term must be negative. The exponential function in the numerator is always positive, so are all the squared terms. Ego-rents X , and the number of nonelectorally dependent decision makers, ξ , are also defined to be positive. In the denominator, the powers also show that it must be positive. The cost function is defined such that $R''(\cdot) > 0$. Thus, the minus sign turns the whole expression negative.

Since the number of nonelectorally dependent actors, ξ forms a product with the economic variance, σ_{ϵ}^2 , in equation 6.6, total differentiation yields very similar results.

$$\frac{\partial d^*}{\partial \xi} = -\frac{1}{4} \frac{\sigma_{\epsilon}^2 e^{-\frac{\nu^2(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2)}{2\sigma_{\mu^a}^2}} \sqrt{2}(\nu^2(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2) + \sigma_{\mu^a}^4)X}{\sqrt{\pi}[\sigma_{\mu^a}^4(\sigma_{\mu^a}^2 + \xi \sigma_{\epsilon}^2)^{\frac{3}{2}} R''(d^*)]} < 0 \quad (6.2)$$

Equivalently to equation 6.1 it is easy to see that the whole expression must be negative.

6.8.2 Empirical

Table 6.1: Descriptive statistics (volatility)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	470	-1.39	-1.78	4.27	-12.26	18.82
Growth (1 year)	470	2.78	2.80	2.00	-6.24	10.42
Growth (2 year)	470	5.78	5.80	3.66	-9.75	20.95
LnGDP	470	10.01	10.12	0.56	8.24	11.64
LnVariance	470	-1.05	-1.25	1.36	-5.30	3.06
Elect	470	0.19	0	0.39	0	1

Table 6.2: Descriptive statistics (regulate)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	613	-2.31	-2.53	4.29	-15.73	18.48
Growth (1 year)	613	2.83	2.78	2.21	-6.24	11.50
LnGDP	613	9.89	9.97	0.60	7.82	11.55
Regulate	613	7.10	7.24	0.76	5.14	8.64
Elect	613	0.17	0	0.38	0	1

Table 6.3: Descriptive statistics (economic openness)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	604	-2.61	-2.77	4.21	-15.73	15.37
Growth (1 year)	604	2.73	2.71	2.14	-6.24	11.50
LnGDP	604	9.80	9.94	0.64	7.82	11.30
Open	604	74.36	75.49	13.02	36.99	98.90
Elect	604	0.16	0	0.37	0	1

Chapter 7

Coalition Government I

7.1 Introduction

A political budget cycle emerges when the government has an incentive to borrow strategically before an election. Yet even though in functional democracies ‘the government’ is a *single* actor, at least at the national level, it need not be a *unified* actor: it can be made up of a coalition of parties. The literature on strategic debt, including the preceding chapters of this thesis, has hitherto largely treated coalition and single-party government without distinction. When Rogoff and Sibert devised their path breaking theory of political budget cycles under rational expectations, they analysed government as a unitary actor.¹ In a follow-up chapter Rogoff briefly discusses the relevance of political budget cycles to multi-party government: “although each of the parties may care about increasing its representation in the government, individual legislators have a strong common interest in their own reelection.”² For this reason, he argues, governing parties will have a joint incentive for expansionary fiscal policies before elections.

Yet there are substantive differences between single- and multi-party governments. Coalition members are distinct parties and thus ultimately compete against each other. For example in April 2010, the Italian speaker of the Chamber of Deputies, Gianfranco Fini, triggered a ‘shouting match’ with Prime Minister Berlusconi whom he accused of bowing too much to the demands of their coalition partner, the Northern League. “I don’t like the house that I helped to create”, he exclaimed.³ When distinct parties unite under one roof, they primarily do so for the purpose of governing and they will thus compete internally with each other over both policies and power.

This competition is aggravated when elections draw near and each party focuses on its own electoral fate. Accordingly, when two of India’s coalition parties fell out shortly before the general election of 2009, Prime Minister Manmohan Singh was unperturbed: “in a coalition, if one colleague criticises the other on the eve of the election I don’t think we should take a too tragic view of this.”⁴ After all, each party will compete against all others in an election. Therefore, even though they share a common interest in re-election, it should be stressed that they are mainly concerned with their *own* re-election, irrespective of their coalition partners. This chapter will thus take to examining individual parties’ incentives

¹Rogoff, Kenneth and Sibert, Anne (1988) Elections and Macroeconomic Policy Cycles, *The Review of Economic Studies*, Vol. 55, No. 1.

²Rogoff, Kenneth (1990) Equilibrium Political Budget Cycles, *The American Economic Review*, Vol. 80, No. 1, p. 34.

³Jones, Gavin and Biondi, Paolo (2010) Berlusconi in Shouting Match with Top Ally Fini, *Reuters*, 22 April (URL: <http://www.reuters.com/assets/print?aid=USTRE63L4L820100422>).

⁴Kumar, Navika (2009) Secular-Communal Divide Can’t be Bridged: PM, *Times Now*, 21 April (URL: <http://www.timesnow.tv/Secular-communal-divide-cant-be-bridged-PM/articleshow/4314007.cms>).

to borrow before elections and show that these incentives can differ substantially across coalition partners.

As in the previous chapter, chapter 6, the emphasis will be on signal extraction. However, instead of looking at nonelectorally dependent decision makers, this chapter is concerned with governments which, in a democracy, are electorally dependent. The key problem to be addressed in this chapter is that a government may be made up of several decision makers but can only enact one policy. When a government is able to provide more public goods at a constant tax rate, voters can infer that it has become more competent. Yet at the polls, they can only vote for one party.⁵ Which party will they want to select based on the competence shock they observe? This chapter will show that larger parties benefit more from aggregate competence shocks than smaller parties. For this reason, they have a stronger incentive to feign competence before elections.

The primary aim of this chapter is to derive a formal model that exposes the incentives for individual coalition partners to increase deficits before elections. The chapter will then explore how the individual incentives are likely to be aggregated into government policy. This discussion will allow to derive empirical hypotheses to be tested in the next chapter. The emphasis in this chapter and the subsequent, empirical chapter is the size of coalition parties. The formal model developed in this section, however, provides for further insights into electorally induced incentives to borrow under coalition government.

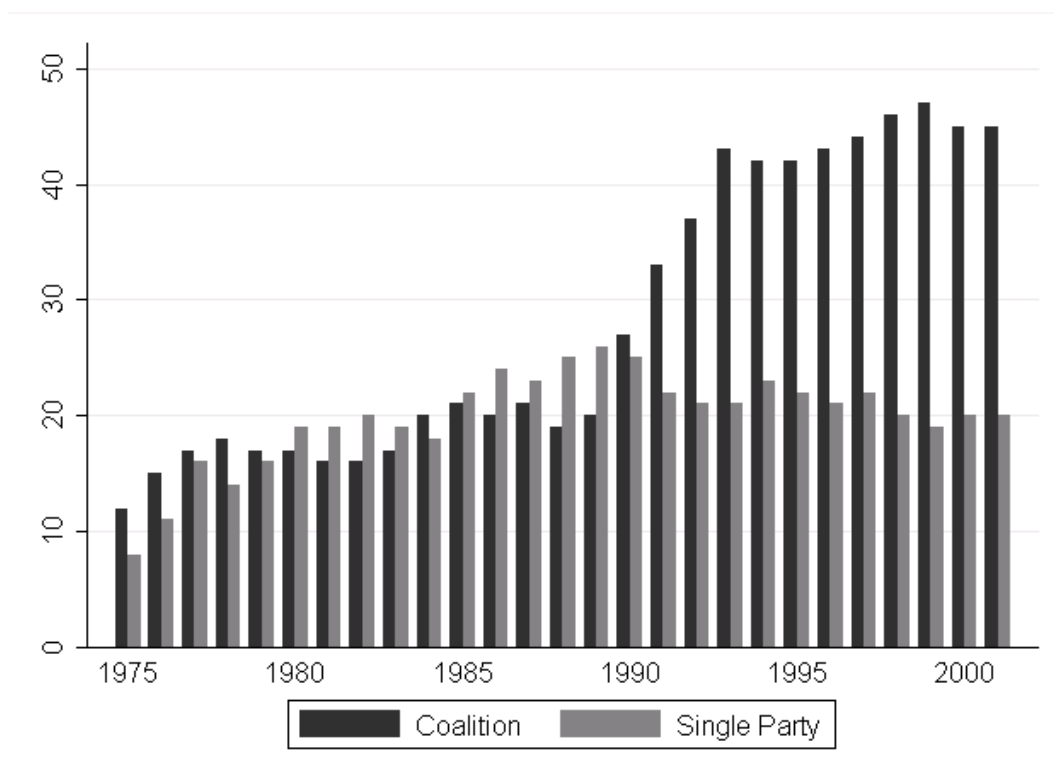
For one, the chapter will show that more centrist parties have greater incentives to borrow because competence boosts may outweigh party allegiances of voters on either side of the political spectrum. These voters may then vote based on government competence rather than the ideological preference they have for a competitor, making electioneering profitable for centrist parties. More extremist parties will find it harder to appeal to ideologically more distant voters and thus have less to gain from feigning competence. Secondly, parties that are historically probable of being pivotal to the formation of a coalition have an incentive to borrow if they are relatively large and thus gain from competence shocks. This is intuitive. The more likely a party is to join a coalition, the more it will want to increase its seat share, assuming that it will translate into cabinet portfolios. These insights of the formal model, although interesting in their own right, are only subsidiary since this part of the thesis focuses on signal extraction. They will thus not be pursued at the empirical stage in chapter 8.

This chapter constitutes the first attempt to formally analyse political budget cycles

⁵Depending on the electoral system voters may be able to cast more than one vote, as, e.g. in Italy and Germany; however the ballot structure will still impose limits on the number of parties.

under coalition government. It thus makes an important contribution to understanding the dynamics of strategic debt across the world. Figure 7.1 shows the number of single-party and coalition governments across the world from 1975 until 2001.⁶ It demonstrates that at least half of the governments in democratic societies have been made up by multiple parties - and since the 1990s, the ratio of coalition to single-party government has even been around 2:1.⁷ The study of strategic debt under coalition government thus deserves a more thorough treatment. The following argument takes a first step in this direction.

Figure 7.1: Frequency of coalition government



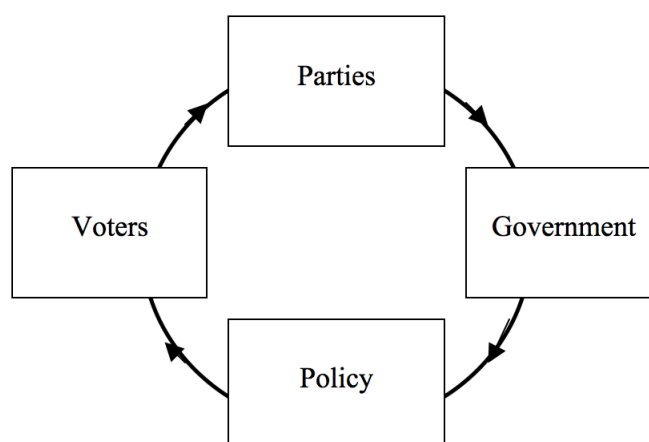
Note: Data obtained from the World Bank's *Database of Political Institutions*, Beck *et al.* (2001).

The remainder of this chapter proceeds as follows. Section two embeds the argument in

⁶The figure includes only competitive democracies and is based on data from the World Bank's *Database of Political Institutions*. Beck, Thorsten *et al.* (2001) *New Tools in Comparative Political Economy: The Database of Political Institutions*, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

⁷The steep increase in coalition parties in the 1990s is mainly caused by the democratising ex-Soviet countries. These countries are often characterised by coalition government due to the transition experience which required cooperation and inclusiveness. See, e.g. Kitschelt, Herbert *et al.* (1999) *Post-Communist Party Systems: Competition, Representation, and Inter-Party Cooperation*, Cambridge: Cambridge University Press. Alternatively, where Communist parties were strong, majoritarian democratic institutions emerged, which in turn can accelerate political fragmentation, resulting in coalition politics. See Przeworski, Adam (1991) *Democracy and the Market: Political and Economic Reforms in Eastern Europe and Latin America*, Cambridge: Cambridge University Press; Geddes, Barbara (1996) *Initiation of New Democratic Institutions in Eastern Europe and Latin America*, In Lijphart, Arend and Waisman, Carlos H., editors *Institutional Design in New Democracies: Eastern Europe and Latin America*, Boulder, CO: Westview Press and Filippov, Mikhail G., Ordeshook, Peter C. and Shvetsova, Olga V. (1999) *Party Fragmentation and Presidential Elections in Post-Communist Democracies*, *Constitutional Political Economy*, Vol. 10, No. 1.

Figure 7.2: The democratic circle



the academic discourse by discussing the related literature. The next section, section three, will then develop a formal model of coalition incentives for strategic debt with a particular emphasis on the allocation of governing responsibility. Section four will briefly introduce and discuss other insights that directly flow from the model but will not be further pursued in the empirical analysis. The fifth section examines the empirical implications of the theoretical predictions, deriving testable hypotheses for the empirical analysis in chapter 8. The last section concludes.

7.2 Related Literature

Studying coalition government is a complex task and combines many strands of research in politics. Figure 7.2 illustrates the political process in a democracy in form of a ‘democratic circle.’ Democracy means ‘rule of the people’, and accordingly, the circle begins with the voters in the box on the left. The study of political budget cycles under coalition government mainly focuses on the stages from government to policy, i.e. public expenditure to feign competence. However, insights from all four boxes will have to be incorporated for a thorough treatment of strategic debt under coalition government.

7.2.1 From Voters to Parties

The circle begins with the voters in the left box. In a democracy, voters have the choice among multiple parties who compete for public office. Downs introduced the notion that voters vote for the party that gives them the highest utility, represented by the arrow from

voters to parties.⁸ Downs's rational calculus of voting has been the fundamental basis of the positive analysis of politics, including the theoretical analysis in this thesis. If two parties compete on a single policy dimension, Downs's theory predicts the convergence of all parties on the median position. This prediction, however, drew considerable criticism in particular with respect to its empirical validity.

Multiple reasons were suggested as to why party position may diverge.⁹ Two of those arguments are particularly relevant for the study of coalition government. Wittman, and in a similar vein Besley and Coate in their citizen-candidate model, argue that parties may diverge in positions if candidates themselves have policy preferences.¹⁰ In this case, parties need not converge at the median and parties with non-represented policy positions can enter the competition for public office. Secondly, apart from candidate preferences, the mere possibility of entry can result in diverging policy positions, as demonstrated by Palfrey.¹¹ The possibility of entry, in turn, depends on the institutional structure of the electoral system. The effect of electoral formula on the party system has been one of the longest studied areas in political science.¹² It demonstrates in particular that proportional representation results in a larger number of represented parties than majoritarian electoral systems. The more parties are represented in the legislature the more likely it is that a coalition of parties will be required to form a government. In the model below such systems will be considered, in which multiple parties compete for office and parties choose divergent policy positions.

If multiple parties are represented in the legislature, voters do not need to vote sincerely for the party closest to their ideological preferences. Rather, they may vote strategically in order to strengthen coalitions of parties whose ideological mean is closest to the voter.¹³ Strategic voting makes the analysis increasingly complex because the vote choice does not

⁸Downs, Anthony (1957) *An Economic Theory of Democracy*, New York, NY: Harper

⁹For a concise overview, see, e.g. Ansolabehere, Stephen (2006) Voters, Candidates, and Parties, In Weingast, Barry R. and Wittman, Donald A., editors *The Oxford Handbook of Political Economy*, Oxford: Oxford University Press, pp. 35-38.

¹⁰Wittman, Donald A. (1983) Candidate Motivation: A Synthesis of Alternative Theories, *The American Political Science Review*, Vol. 77, No. 1; Besley, Timothy and Coate, Stephen (1997) An Economic Model of Representative Democracy, *Quarterly Journal of Economics*, Vol. 112, No. 1. For a discussion of the citizen-candidate model, see also chapter 5.2 of this thesis.

¹¹Palfrey, Thomas R. (1984) Spatial Equilibrium with Entry, *The Review of Economic Studies*, Vol. 51, No. 1.

¹²Duverger, Maurice (1954) *Political Parties: Their Organization and Activity in the Modern State*, New York, NY: Methuen; Rae, Douglas (1967) *The Political Consequences of Electoral Laws*, New Haven, CT: Yale University Press; Sartori, Giovanni (1976) *Parties and Party Systems: A Framework for Analysis*, Cambridge: Cambridge University Press; Cox, Gary W. (1990) Centripetal and Centrifugal Incentives in Electoral Systems, *American Journal of Political Science*, Vol. 34, No. 4; Cox, Gary W. (1997) *Making Votes Count: Strategic Coordination in the World's Electoral Systems*, Cambridge: Cambridge University Press.

¹³McKelvey, Richard D. and Ordeshook, Peter C. (1972) A General Theory of the Calculus of Voting, In Herndon, James F. and L., Bernd Joseph, editors *Mathematical Applications in Political Science*, Volume 6, Charlottesville, VA: University Press of Virginia; Cox (1997) (as in n. 12).

directly follow from the voters' position in the policy space. To keep the analysis parsimonious, the model below will assume sincere voting.¹⁴ This simplification is justified for two reasons. Firstly, the model concentrates on government behaviour, rather than the vote choice *per se*. Strategic voting would make the model significantly more complicated but only add few more insights.¹⁵ Secondly, the analysis focuses on competence signals, which do not depend on a government's ideology, constituting the basis of a strategic vote choice. This approach can be reconciled with Stokes's valence-related argument that voters care about attributes of candidates, such as trustworthiness or, indeed, administrative competence.¹⁶ In the model, voters vote sincerely for their preferred party but trade-off their ideological preferences for supporting a competent candidate. Competence signals can thus target voters that are indifferent between parties, in other words swing voters.

Since the model below studies coalition government, it will integrate insights from an extensive literature. This first part of the political process, from voters to parties, is an important foundation of the analysis because it can explain why there are multiple parties in government, what policy positions they will choose, and how voters decide on the party to support. However, these aspects will not be explicitly modeled but taken as exogenously given.

7.2.2 From Parties to Government

If there are multiple parties in the legislature, it is unlikely that one party alone will meet the required number of seats in parliament to govern alone.¹⁷ In that case a coalition among parties will have to form. The literature on the formation of coalition government goes back to Riker's seminal work on minimal winning coalitions.¹⁸ Riker argues that coalitions would form with the smallest number of parties necessary to meet the majority requirement, in order to limit the number of players with whom to share the spoils from office. A related theory adds an ideological dimension to Riker's argument. Axelrod maintains that parties will not only want to minimise the number of coalition members, but also maximise

¹⁴This is in line with similar models, see, e.g., Persson, Torsten, Roland, Gérard and Tabellini, Guido E. (2007) Electoral Rules and Government Spending in Parliamentary Democracies, *Quarterly Journal of Political Science*, Vol. 2, No. 2.

¹⁵For an example of modeling the vote choice under strategic voting see Duch, Raymond M. and Stevenson, Randolph T. (2008) *The Economic Vote: How Political and Economic Institutions Condition Election Results*, Cambridge: Cambridge University Press.

¹⁶Stokes, Donald E. (1963) Spatial Models of Party Competition, *The American Political Science Review*, Vol. 57, No. 2. For the importance of valence in support for British political parties, see in particular

¹⁷Of course there may be cases where there are many small parties and one very large party which will be able to form a single-party government. However, as long as the distribution of legislative seats is not heavily disproportional this case seems rather unusual.

¹⁸Riker, William H. (1962) *The Theory of Political Coalitions*, New Haven, CT: Yale University Press.

ideological cohesion.¹⁹

One major criticism of this early work on coalition formation was that it was ‘institutions-free.’²⁰ Since Shepsle had forcefully argued for the introduction of institutions into positivist (formal) theories of politics, institutions formed a major part of the analysis of choices made by political actors.²¹ Shepsle provided the solution to the problem of unstable equilibria in voting games in a multi-dimensional policy space, as pointed out most notably by Arrow and McKelvey.²² He is thus the intellectual father of structure-induced equilibria models, in which an equilibrium policy can emerge in a multi-dimensional policy. Together with Laver, Shepsle then applied his insights to the formation of coalition government, showing how parties positioned in a multi-dimensional policy space form coalitions based on credible alternatives, given the preferences of bargaining parties.²³

One of the virtues of the Laver and Shepsle model was that it could explain the formation of minority governments. Strøm had previously drawn considerable attention to the frequency of minority government.²⁴ Institution-free approaches were not able to deal with this phenomenon. One important drawback, however, was that their theory was specific to the three-party case with two dimensions and broke down as the model was extended to higher dimensions and more parties.²⁵

An alternative approach was suggested through the theory of sequential bargaining, as introduced by Baron and Ferejohn.²⁶ The underlying idea of their model is that institutions determine the rule according to which a proposer for a specific policy is chosen. Proposers then offer policy concessions to all bargaining actors. Proposals are either accepted or rejected, in which case another proposer is selected. Although the Baron-Ferejohn model was initially conceived in the context of legislative bargaining, Baron extended it to bargaining

¹⁹Axelrod, Robert M. (1970) *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*, Chicago, IL: Markham Pub. Co..

²⁰Diermeier, Daniel (2006) Coalition Government, In Weingast, Barry R. and Wittman, Donald A., editors *The Oxford Handbook of Political Economy*, Oxford: Oxford University Press, p. 163.

²¹Shepsle, Kenneth A. (1979) Institutional Arrangements and Equilibrium in Multidimensional Voting Models, *American Journal of Political Science*, Vol. 23, No. 1.

²²Arrow, Kenneth J. (1963) *Social Choice and Individual Values*, 2nd edition. New York, NY: Wiley; McKelvey, Richard D. (1976) Intransitivities in Multidimensional Voting Models and Some Implications for Agenda Control, *Journal of Economic Theory*, Vol. 12; McKelvey, Richard D. (1979) General Conditions for Global Intransitivities in Formal Voting Models, *Econometrica: Journal of the Econometric Society*, Vol. 47, No. 5. See also Schofield, Norman (1978) Instability of Simple Dynamic Games, *The Review of Economic Studies*, Vol. 45, No. 3.

²³Laver, Michael and Shepsle, Kenneth A. (1990) Coalitions and Cabinet Government, *The American Political Science Review*, Vol. 84, No. 3.

²⁴Strøm, Kaare (1985) Party Goals and Government Performance in Parliamentary Democracies, *The American Political Science Review*, Vol. 79, No. 3; Strøm, Kaare (1990) *Minority Government and Majority Rule*, Cambridge: Cambridge University Press.

²⁵Austen-Smith, David and Banks, Jeffrey (1990) Stable Governments and the Allocation of Policy Portfolios, *The American Political Science Review*, Vol. 84, No. 3.

²⁶Baron, David P. and Ferejohn, John (1989) Bargaining in Legislatures, *The American Political Science Review*, Vol. 83, No. 4.

over cabinet portfolios.²⁷ Baron's models could theoretically account for a number of possible government constellations. However, they did not fare well empirically.

In particular, they could not account for an empirical regularity, governed by Gamson's Law.²⁸ Gamson's Law stipulates that the number of portfolios is proportional to a party's seat share.²⁹ A variation of Baron's model of sequential bargaining was suggested by Morelli.³⁰ He argues that instead of the proposer making offers to other parties, all bargaining actors make demands. If the proposer is chosen based on the size of the seat share, Morelli's model can also account for Gamson's Law.³¹ An alternative model that can account for Gamson's Law was recently proposed by Carroll and Cox.³² They argue that coalition bargaining begins before the election is held. In anticipation of the results, proto-coalitions will be built. Carroll and Cox show that in this case, coalitions will be formed in accordance with Gamson's Law.

These insights will be important for the theoretical model in particular for deriving the empirical implications of the model. What measures are good indicators of a government's bargaining strength that will determine the cabinet's policy on pre-election debt? The literature suggests that Gamson's Law plays an important role because it relates the seat share to a party's probability of being the formateur for a coalition. It also provides insights into the likely influence of parties on the cabinet's policy decisions. The type of coalition is thus closely connected with the fourth box, at the bottom of figure 7.2, with an arrow pointing from government to policy.

7.2.3 From Government to Policy

Studying how the type of government influences policy builds on the previous two boxes in figure 7.2, voters and parties, although these underlying processes are in most cases not explicitly mentioned or modeled.³³ However, it is important to keep in mind that all parts of

²⁷Baron, David P. (1989) A Noncooperative Theory of Legislative Coalitions, *American Journal of Political Science*, Vol. 33, No. 4; Baron, David P. (1991) A Spatial Bargaining Theory of Government Formation in Parliamentary Systems, *The American Political Science Review*, Vol. 85, No. 1.

²⁸Gamson, William A. (1961) A Theory of Coalition Formation, *American Sociological Review*, Vol. 26, No. 3.

²⁹Browne, Eric C. and Franklin, Mark N. (1973) Aspects of Coalition Payoffs in European Parliamentary Democracies, *The American Political Science Review*, Vol. 67, No. 2; Browne, Eric C. and Frendreis, John P. (1980) Allocating Coalition Payoffs by Conventional Norm: An Assessment of the Evidence from Cabinet Coalition Situations, *American Journal of Political Science*, Vol. 24, No. 4; Schofield, Norman and Laver, Michael (1985) Bargaining Theory and Portfolio Payoffs in European Coalition Governments 1945-83, *British Journal of Political Science*, Vol. 15; Powell Jr., G. Bingham (2000) *Elections as Instruments of Democracy: Majoritarian and Proportional Visions*, New Haven, CT: Yale University Press.

³⁰Morelli, Massimo (1999) Demand Competition and Policy Compromise in Legislative Bargaining, *The American Political Science Review*, Vol. 93, No. 4.

³¹Diermeier (2006) (as in n. 20), p.172.

³²Carroll, Royce and Cox, Gary W. (2007) The Logic of Gamson's Law: Pre-election Coalitions and Portfolio Allocations, *American Journal of Political Science*, Vol. 51, No. 2.

³³For an excellent example of linking government policy to both the type of government and party systems,

the democratic circle are connected. This is a consequence of the very nature of democracies where power is delegated to governments for a specified period after which elections are held in which voters can punish politicians for their conduct in office. For this reason, policies in democratic societies will always be decided with an eye on the voters' preferences. Thus, the arrow from policy to voters is an implicit extension of the arrow from government to policy. Yet the literature on the link between government and policy focuses on politicians rather than voters. To be sure, government ideology is one important determinant of fiscal policy. Institutions are another key determinant and more closely related to the main focus of this thesis.

From this perspective, the literature on the political economy of fiscal policy is neatly summarised by von Hagen.³⁴ He highlights the principal-agent relationship between voters (the principals) and government (the agent).³⁵ This relationship, von Hagen argues, implies that governments conduct policy on behalf of the electorate - but governments are rent-seeker and rules are in place to restrict this behaviour. Yet von Hagen explains that 'the uncertainty and complexity of economic and political developments prohibit the writing of complete contracts. Therefore the principal-agent relation resembles an 'incomplete contract' leaving politicians with considerable residual power.'³⁶ This residual power is at the core of much of the literature focusing on the link between the type of government and policy.

One stream of this literature focuses on the common-pool problem which arises when politicians do not internalise the cost of their policies and finance specific expenditure from a common tax pool. In this case, expenditure levels can arise that are sub-optimal for society as a whole.³⁷ Persson and Tabellini (often together with other co-authors) focus in particular on the incentives for sub-optimal social spending that flow from different electoral formulas and systems of government.³⁸ They find, for example, that proportional representation and

see Persson, Roland and Tabellini (2007) *Quarterly Journal of Political Science* (as in n. 14). See also Khemani, Stuti and Wane, Waly (2008) Populist Fiscal Policy, *Policy Research Working Paper Series 4762*, (URL: <http://go.worldbank.org/FBFBGNSNGO>).

³⁴Hagen, Jürgen von (2006) Political Economy of Fiscal Institutions, In Weingast, Barry R. and Wittman, Donald A., editors *The Oxford Handbook of Political Economy*, Oxford: Oxford University Press. – chapter 9.

³⁵For the principal-agent theory of representative democracies see also chapter 2.2 of this thesis.

³⁶Hagen (2006) (as in n. 34), p. 464.

³⁷See, e.g., Weingast, Barry R., Shepsle, Kenneth A. and Johnsen, Christopher (1981) The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics, *The Journal of Political Economy*, Vol. 89, No. 4; Roubini, Nouriel et al. (1989) Government Spending and Budget Deficits in the Industrial Countries, *Economic Policy*, Vol. 8, No. 4; Roubini, Nouriel and Sachs, Jeffrey D. (1989a) Fiscal Policy, *Economic Policy*, Vol. 8, No. 4; Roubini, Nouriel and Sachs, Jeffrey D. (1989b) Political and Economic Determinants of Budget Deficits in the Industrial Democracies, *European Economic Review*, Vol. 33, No. 5; Alesina, Alberto and Perotti, Roberto (1996) Fiscal Discipline and the Budget Process, *The American Economic Review*, Vol. 86, No. 2.

³⁸Persson, Torsten, Roland, Gérard and Tabellini, Guido E. (2000) Comparative Politics and Public Finance, *The Journal of Political Economy*, Vol. 108, No. 6; Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press; Persson, Torsten and Tabellini, Guido E. (2003) *The Economic Effects of Constitutions*, Cambridge, MA: MIT Press; Persson, Torsten and Tabellini, Guido E. (2004b) Constitutions and Economic Policy, *The Journal of Economic Per-*

parliamentary systems are associated with higher expenditure levels than a majoritarian electoral formula or presidential elections. In particular in a recent chapter they show how coalition government can result in higher public expenditure because voters can discriminate between coalition partners.³⁹ For this reason, coalition parties have an incentive to target narrow groups of voters, rather than provide broad public goods as single-party governments would do.⁴⁰ This highlights how incentives for policy can differ between coalition and single-party governments.

However, incentives do not always translate directly into policy. Budge and Keman point out that “[t]he degree to which parties are free to get their policies through depends [amongst others] on whether a government is a single-party or a coalition, and whether it commands a majority or minority of seats in the legislature”⁴¹ The more actors are involved in the policy-making process the more potential veto players there are. Tsebelis has shown how veto players create a bias for the status quo.⁴² Commensurate with veto-player theory, Alesina and Drazen demonstrate how coalition partners can engage in a ‘war of attrition’ in order to avoid the blame for unpopular policies, in particular expenditure cuts, resulting in policy deadlock.⁴³ Governing parties will thus have to bargain over policy with other parties or, in the case of minority government, with the opposition.

How then are individual incentives of coalition members translated into policy? Hallerberg *et al.* highlight the power of the party that controls the ministry of finance in making policy.⁴⁴ However, much of the literature looks at the bargaining strength of parties.⁴⁵ These studies find that government policy is particularly influenced by larger, more powerful, parties. This insight is crucial for deriving the empirical implications that flow from the

spectives, Vol. 18, No. 1; Persson, Torsten and Tabellini, Guido E. (2004a) Constitutional Rules and Fiscal Policy Outcomes, *The American Economic Review*, Vol. 94, No. 1.

³⁹Persson, Roland and Tabellini (2007) *Quarterly Journal of Political Science* (as in n. 14).

⁴⁰See also Bawn, Kathleen and Rosenbluth, Frances (2006) Short Versus Long Coalitions: Electoral Accountability and the Size of the Public Sector, *American Journal of Political Science*, Vol. 50, No. 2.

⁴¹Budge, Ian and Keman, Hans (1993) *Parties and Democracy: Coalition Formation and Government Functioning in Twenty States*, Oxford: Oxford University Press, p. 133.

⁴²Tsebelis, George (1995) Decision Making in Political Systems: Veto Players in Presidentialism, Parliamentarism, Multicameralism and Multipartyism, *British Journal of Political Science*, Vol. 25, No. 3; Tsebelis, George (2002) *Veto Players: How Political Institutions Work*, Princeton, NJ: Princeton University Press.

⁴³Alesina, Alberto and Drazen, Allan (1991) Why Are Stabilizations Delayed? *The American Economic Review*, Vol. 81, No. 5.

⁴⁴Hallerberg, Mark, Strauch, Rolf and Hagen, Jürgen von (2007) The Design of Fiscal Rules and Forms of Governance in European Union Countries, *European Journal of Political Economy*, Vol. 23, No. 2; Hallerberg, Mark, Strauch, Rolf R. and Hagen, Jürgen von (2009) *Fiscal Governance in Europe*, Cambridge: Cambridge University Press.

⁴⁵Edin, Per-Anders and Ohlsson, Henry (1991) Political Determinants of Budget Deficits: Coalition Effects Versus Minority Effects, *European Economic Review*, Vol. 35, No. 8; De Haan, Jakob and Sturm, Jan-Egbert (1997) Political and Economic Determinants of OECD Budget Deficits and Government Expenditures: A Reinvestigation, *European Journal of Political Economy*, Vol. 13, No. 4; Balassone, Fabrizio and Giordano, Raffaella (2001) Budget Deficits and Coalition Governments, *Public Choice*, Vol. 106, No. 3; Huber, Gerald, Kocher, Martin and Sutter, Matthias (2003) Government Strength, Power Dispersion in Governments and Budget Deficits in OECD-Countries: A Voting Power Approach, *Public Choice*, Vol. 116, No. 3.

theoretical model of coalition incentives for strategic debt below.

7.2.4 From Policy to Voters

The last element of the democratic circle specifies how policy is perceived by voters. This final link is important for the analysis of political budget cycles. For one, governments may benefit from competence signals in different ways, altering their incentives for electioneering. Anderson examines how voters assign credit and blame in the case of coalition government; he argues that, as opposed to the case of single-party government, with a coalition government voters “may also compare one governing party with another based on their issue priorities or compare the governing parties to the opposition.”⁴⁶ Indeed, coalition partners are competitors and thus policies that may benefit one coalition partner may harm another. In the extreme case, it is even conceivable that voters categorically exclude opposition parties from their set of viable candidates. For example, Austrian voters may switch allegiance between the conservative Austrian People’s party (ÖVP) and the far-right Freedom of Austria Party (FPÖ), but never consider voting for the Social Democratic Party (SPÖ). Thus, competence signals in the case of coalition government can shape the benefit-cost calculus of electioneering in vastly different ways for individual coalition partners.

If all coalition partners benefit equally from competence shocks, they would have similar incentives for strategic debt. However, this is unlikely to be the case. The literature on the share of governing responsibility and signal extraction has shown that larger parties receive more credit (or blame) for policy than smaller parties.⁴⁷ Thus, incentives for electioneering are likely to differ across coalition partners, depending on their relative size. This will be the main emphasis of the formal model below.

7.2.5 Squaring the Circle

This chapter examines political budget cycles under coalition government. As argued earlier on, the analysis of coalition government is very complex because it incorporates elements from each stage of the democratic circle in figure 7.2. This is thus a formidable task which may explain as to why it has only been attempted to a limited degree. Kayser shows formally how single-party governments can generate stronger political budget cycles

⁴⁶ Anderson, Christopher J. (1995) *Blaming the Government: Citizens and the Economy in Five European Democracies*, Armonk, NY: M.E. Sharpe.

⁴⁷ See in particular Duch and Stevenson (2008) (as in n. 15). For other conceptualisations of the clarity of responsibility see, e.g., Powell Jr, G.Bingham and Whitten, Guy D. (1993) A Cross-National Analysis of Economic Voting: Taking Account of the Political Context, *American Journal of Political Science*, Vol. 37, No. 2.

than coalition government.⁴⁸ However, he only derives this as a subsidiary result and does not pay attention to any intra-coalition dynamics. Chang does show for a sample of OECD samples that political cycles in expenditure decrease as the number of coalition partners increases, yet his argument is merely based on veto-player theory and thus ignores the more subtle dynamics of coalition politics.⁴⁹ Saporiti and Streb look at a related case where the democratic process is divided between the president and the legislature, each dominated by different (and opposing) parties.⁵⁰ This case resembles coalition government in that legislation can only be passed if both branches of government cooperate. This is a special case, in which responsibility is relatively clearly divided, with the government being responsible for competence signals. However, it provides useful insights in demonstrating how different co-decision laws influence the magnitude of the budget cycle. This analysis complements the model below, which concentrates on the size and bargaining power of governing parties.

Tackling the challenge of analysing political budget cycles under coalition government comes at the cost of a few sacrifices in the form of simplifications. As argued above, the analysis builds on all elements of the democratic circle in figure 7.2. However, to keep the analysis parsimonious, not all features of the model will be treated as endogenous. Exogenous features are the position of parties in the policy, as well as the number of parties. In accordance with other models in the literature, there will be at most two parties in government.⁵¹ This is a potential limitation, as it does not necessarily allow for generalisations to larger coalitions.⁵² Moreover, sincere voting is not a particularly realistic assumption. Lastly, when deriving the empirical implications of the theoretical model, a few shortcuts will have to be taken, concentrating on the size and bargaining power of the largest party to make predictions about the eventual level of strategic debt. However, in spite of these limitations, the model will provide interesting insights, with empirically testable predictions - and it constitutes the first step toward a thorough understanding of political budget cycles under coalition government.

⁴⁸Kayser, Mark Andreas (2005) Who Surfs, Who Manipulates? The Determinants of Opportunistic Election Timing and Electorally Motivated Economic Intervention, *The American Political Science Review*, Vol. 99, No. 1.

⁴⁹Chang, Eric C.C. (2008) Electoral Incentives and Budgetary Spending: Rethinking the Role of Political Institutions, *The Journal of Politics*, Vol. 70, No. 4.

⁵⁰Saporiti, Alejandro and Streb, Jorge M. (2008) Separation of Powers and Political Budget Cycles, *Public Choice*, Vol. 137, No. 1.

⁵¹See, e.g. Lupia, Arthur and Strøm, Kaare (1995) Coalition Termination and the Strategic Timing of Parliamentary Elections, *The American Political Science Review*, Vol. 89, No. 3; Diermeier, Daniel, Eraslan, Hulya and Merlo, Antonio (2003) A Structural Model of Government Formation, *Econometrica*, Vol. 71, No. 1; Persson, Roland and Tabellini (2007) *Quarterly Journal of Political Science* (as in n. 14).

⁵²Diermeier (2006) (as in n. 20), p. 178.

7.3 Theory

This section models the incentives of individual coalition partners to increase the budget deficit before elections. As in previous chapters, it builds on the moral hazard competence model of political budget cycles, as employed in the recent literature.⁵³ Let Voter i 's utility U at time t be expressed as follows:

$$U_s^i = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + \psi^j] \quad (7.1)$$

This is a two-period model and β represents the discount factor; for simplicity it is assumed to equal one. The parameter g_t captures public expenditure, which enters the utility function linearly. Private consumption, c_t is modeled as a standard concave utility function, u , and is itself a function of lump-sum taxes, τ , and personal income, y_t :

$$c_t = y - \tau_t \quad (7.2)$$

Voters are assumed to have a non-economic bias towards the parties that run for office, summarised by the parameter ψ . This parameter differs across all political candidates j and is a function of the party's relative position z on a single policy dimension. Voters are distributed across this dimension such that $\theta \sim \text{unif}[0, 1]$. There are n parties in the legislature and each party j 's policy position is given in accordance with equidistance by

$$z^j = \frac{j - \frac{1}{2}}{n}, \forall j = \{1, 2, \dots, n\} \quad (7.3)$$

There will be one opposition party and k coalition parties. It will be assumed that coalition partners have to be part of a minimal connected winning coalition.⁵⁴ The coalition parties consist of parties $j = 1, 2, \dots, k$, and the opposition party is $j = n$. Even though there will only be one opposition party in the model it would be easy to extend the analysis to more than one opposition party because the opposition is perfectly passive in this model. Increasing the number of opposition parties thus has no effect on the overall result. It could be useful to think of this party as a catch-all term for an arbitrarily large number of opposition parties.

The non-economic bias ψ for all parties can then be expressed as:

⁵³See, e.g. Persson and Tabellini (2000) (as in n. 38); Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9; Alt, James E. and Lassen, David Dreyer (2006a) Fiscal Transparency, Political Parties, and Debt in OECD Countries, *European Economic Review*, Vol. 50, No. 6.

⁵⁴See Axelrod (1970) (as in n. 19).

$$\psi^j = -|\theta^i - z^j|, \quad \forall j = \{1, 2, \dots, k\} \quad (7.4)$$

Candidate j 's utility is expressed as follows

$$U_s^j = \sum_{s=t}^T \beta^{s-t} [g_s + u(c_s) + \lambda^j X]; \quad \forall j = \{1, 2, \dots, n\} \quad (7.5)$$

The candidates' utility, again, closely resembles the voters' utility function - however instead of a non-economic bias, candidates care about zego-rents', X . The parameter λ indicates the share of party j 's share in government. It is assumed that the amount of ego-rents is proportional to the share in government. The share of government portfolios has to sum to one. For the k parties in government $\lambda > 0$, and for the opposition party $\lambda = 0$. Government expenditure is given by

$$g_t = \tau_t + d_t - R(d_{t-1}) + \eta_t \quad (7.6)$$

The government's competence shock η_t is now the aggregation of each governing party's individual competence shock. It will be assumed that each party's contribution to the overall competence shock is proportional to the size of their portfolio, λ^j .

$$\eta_t = \sum_{j=1}^k \lambda^j \mu_t^j + \sum_{j=1}^k \lambda^j \mu_{t-1}^j = \epsilon_t + \epsilon_{t-1} \quad (7.7)$$

The competence shocks are identically and independently distributed

$$\mu_k \stackrel{iid}{\sim} N(0, s^2) \quad (7.8)$$

As in the previous chapters, the equilibrium deficit will be zero in non-election years and the equilibrium tax is derived as

$$\max_{\tau} \quad E_t[g_t + u(c_t) + \lambda^j X] \quad (7.9)$$

$$s.t. \quad g_t = \tau_t + \eta_t \quad (7.10)$$

The solution to this maximisation problem, solving for the equilibrium tax τ^* , is:⁵⁵

$$\tau_t = \tau^* = y - u_c^{-1}(1) \quad (7.11)$$

⁵⁵The solution to this maximisation problem is described in more detail in the appendix.

This means that the fact that the government is a coalition does not affect the equilibrium tax rate, since the tax rate is independent of the share in government, λ . Candidates thus only differ in their competence and consequently their ability to provide public goods. Voters will form expectations about the candidates' ability to provide public goods as follows

$$E_t[g_{t+1}^j] = \tau^* - E_t[R(d_t^*)] + E_t[\mu_t^j | \epsilon_t], \quad \forall j = 1, 2, \dots, k \quad (7.12)$$

$$E_t[g_{t+1}^n] = \tau^* - E_t[R(d_t^*)] \quad (7.13)$$

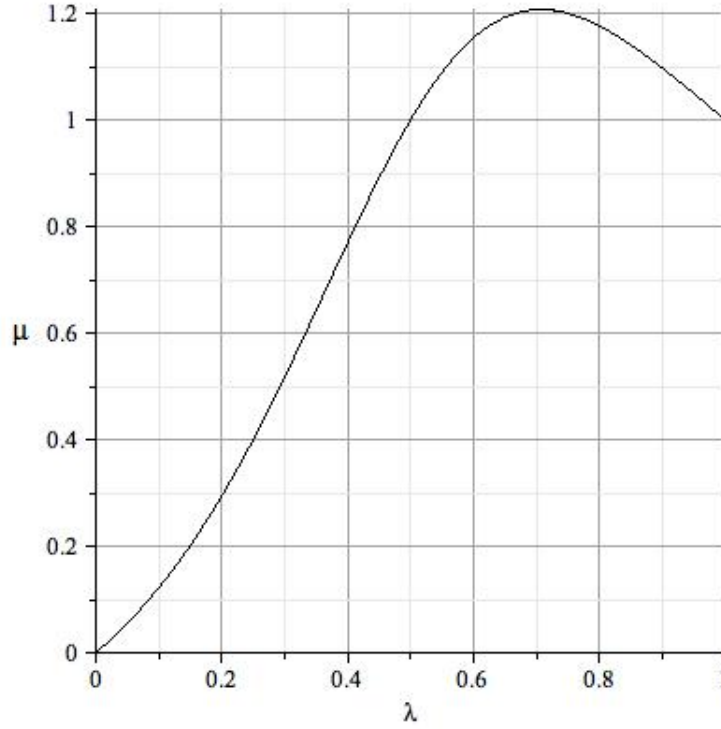
The voters' expectation about the competence of the opposition party, $j = n$ is zero since that party is not responsible for fiscal policy. For coalition parties, voters can form an estimate about each individual party's competence, given the overall competence shock for the government. The expectation of each coalition member's competence shock is conditional on the overall competence shock as well as the information voters have about each party's relative share in government. The conditional expectation is derived in the appendix as

$$E[\mu_t^j | \epsilon_t] = \left(\frac{\epsilon_t \lambda^j}{(\lambda^j)^2 + \phi^j} \right) \quad (7.14)$$

, where $\phi^j = \sum_{j=2}^k (\lambda^j)^2$. As the number of parties in government increases, the analysis becomes increasingly complex and convoluted. For the sake of parsimony, the analysis will thus restrict itself to a maximum of three parties in the legislature, two of which form a coalition. Equation 7.14 provides a formulation for the conditional expectation of coalition member j 's competence shock, μ_t^j , given the government's overall competence shock ϵ_t . Figure 7.3 illustrates this relationship graphically for the case of two coalition parties, varying the portfolio share λ of one of the coalition partners.

The figure clearly shows that for an overall competence shock of $\epsilon_t = 1$, voters will attribute more responsibility to the larger coalition partner. Only at a value of $\lambda = \frac{1}{2}$ will the two coalition partners be expected to be equally competent. It should be noted that the effect of a higher share in government beyond that level on the conditional expectation is non-linear. This makes theoretical sense because the more a coalition government resembles a single-party government, the easier it is for voters to disentangle the individual competence shock from the overall competence shock; in the hypothetical case where a junior partner has no governing responsibility, the expected individual competence shock equals the overall competence shock. This is captured in figure 1 by the fact that $\lambda = \epsilon_t = \mu_t = 1$. Suppose there are three parties in the legislature. Parties *A* and *B* form a coalition, and party *C* is

Figure 7.3: Coalition government and competence estimates



the opposition party. The analysis will focus on party A , but of course, analytically parties A and B are interchangeable. Voter i will vote for party A if:

$$E_t[U_{t+1}^i(A)] \geq E_t[U_{t+1}^i(B)] \quad (7.15)$$

$$E_t[U_{t+1}^i(A)] \geq E_t[U_{t+1}^i(C)] \quad (7.16)$$

Assuming a minimum connected winning coalition, party A is placed between parties B and C with probability q and party B is placed between parties A and C with probability $(q - 1)$. The parameter q can thus also be interpreted as a party's ability to influence the vote choice of the opposition's supporters. In substantive terms, one could perceive q as the degree to which a party appeals to swing-voters; alternatively, it can capture whether a coalition member is more centrist and can thus gain votes both on the left and the right of the political spectrum. Figure 7.4 illustrates the parties' respective positions.

If party A is placed between the other two parties, its vote share can be calculated with the help of equations 7.13, 7.13, 7.15 and 7.16 as follows.

$$E_t[\mu_t^A | \epsilon_t] - E_t[\mu_t^B | \epsilon_t] - |\theta^i - z^A| + |\theta^i - z^B| \geq 0 \quad (7.17)$$

$$E_t[\mu_t^A | \epsilon_t] - |\theta^i - z^A| + |\theta^i - z^C| \geq 0 \quad (7.18)$$

In this case, this means that party A corresponds to candidate $j = 2$, party B corresponds to candidate $j = 1$, and opposition party C corresponds to candidate $j = 3$. From equations 7.3 and 7.4 it follows that:

$$E_t[\mu_t^A|\epsilon_t] - E_t[\mu_t^B|\epsilon_t] - |\theta^i - \frac{3}{6}| + |\theta^i - \frac{1}{6}| \geq 0 \quad (7.19)$$

$$E_t[\mu_t^A|\epsilon_t] - |\theta^i - \frac{3}{6}| + |\theta^i - \frac{5}{6}| \geq 0 \quad (7.20)$$

Solving for θ^i yields:

$$-\frac{1}{2}E_t[\mu_t^A|\epsilon_t] + \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3} \leq \theta^i \leq \frac{1}{2}E_t[\mu_t^A|\epsilon_t] + \frac{2}{3} \quad (7.21)$$

Integrating over θ yields party A 's vote share $V_{t,q}$ when party A is to either side of party B :

$$V_{t,q} = \int_{-\frac{1}{2}E_t[\mu_t^A|\epsilon_t] + \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3}}^{\frac{1}{2}E_t[\mu_t^A|\epsilon_t] + \frac{2}{3}} 1d\theta = E_t[\mu_t^A|\epsilon_t] + \frac{1}{3} - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] \quad (7.22)$$

With probability $(1-q)$ party B is located between parties A and C . Suppose that party A is to the left of party B (though the analysis would be equivalent if party A was to the right of party B). In this scenario, party A corresponds to candidate $j = 1$, party B corresponds to candidate $j = 2$, and opposition party C corresponds to candidate $j = 3$. From equations 7.3, 7.4, 7.19 and 7.20 it follows that:

$$E_t[\mu_t^A|\epsilon_t] - E_t[\mu_t^B|\epsilon_t] - |\theta^i - \frac{1}{6}| + |\theta^i - \frac{3}{6}| \geq 0 \quad (7.23)$$

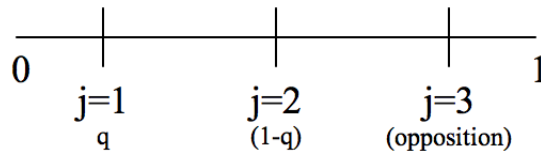
$$E_t[\mu_t^A|\epsilon_t] - |\theta^i - \frac{1}{6}| + |\theta^i - \frac{5}{6}| \geq 0 \quad (7.24)$$

which yields:

$$\theta^i \leq \frac{1}{2}E_t[\mu_t^A|\epsilon_t] - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3} \quad (7.25)$$

$$\theta^i \leq \frac{1}{2}E_t[\mu_t^A|\epsilon_t] + \frac{1}{2} \quad (7.26)$$

Figure 7.4: Party positions in a one-dimensional policy space



It should be noted that equation 7.26 is a special case of equation 7.25 if $E_t[\mu_t^B|\epsilon_t] = \frac{1}{3}$. This case will be ignored because it seems unrealistic that a competence shock can be large enough to wipe out a party's entire support basis. Integrating over θ in equation 7.25 yields the party's vote for party A , $V_{t,(1-q)}$, when it is between the two other parties:

$$V_{t,(1-q)} = \int_0^{\frac{1}{2}E_t[\mu_t^A|\epsilon_t] - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3}} 1d\theta = \frac{1}{2}E_t[\mu_t^A|\epsilon_t] - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3} \quad (7.27)$$

From equations 7.21 and 7.26 the overall expected vote share, V_t is:

$$\begin{aligned} V_t &= q(E_t[\mu_t^A|\epsilon_t] - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3}) + (1-q)(\frac{1}{2}E_t[\mu_t^A|\epsilon_t] - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3}) \\ &= \frac{1}{2}E_t[\mu_t^A|\epsilon_t](q+1) - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] + \frac{1}{3} \end{aligned} \quad (7.28)$$

Equation 7.27 shows that the vote share can be broken up in two parts: the first part, $\frac{1}{2}E_t[\mu_t^A|\epsilon_t](q+1) - \frac{1}{2}E_t[\mu_t^B|\epsilon_t]$ is the vote which party A receives (or loses) on balance from both the coalition partner, party B , and the opposition, party C . The second part, $\frac{1}{3}$ represents the party's core support without the impact of competence on voting. The overall vote gain (or potentially vote loss), δV_t can thus be expressed as

$$\Delta V_t = \frac{1}{2}E_t[\mu_t^A|\epsilon_t](q+1) - \frac{1}{2}E_t[\mu_t^B|\epsilon_t] \quad (7.29)$$

Voters condition their expectation of individual competence on the aggregate competence shock, but they can only infer the size of the aggregate shock if they can observe all other parameters in equation 5. However, voters are assumed to observe the deficit with a one period time lag. They thus cannot observe d but will form an estimate of it, $\tilde{d}$. Their best guess of the government's competence shock in period t is thus

$$E_t[\epsilon_t] = \hat{\epsilon}_t = g_t - \tau^* - \tilde{d}_t - \epsilon_{t-1} \quad (7.30)$$

Substituting equation 7.6 into equation 7.30 yields

$$E_t[\epsilon_t] = \hat{\epsilon}_t = \epsilon_t + d_t - \tilde{d}_t \quad (7.31)$$

Now, the voters have an estimate of the shock of the whole government. They will then have to form an estimate over each individual party's competence shocks with the help of

equation 7.14.

$$E_t[\mu_t^A | \hat{\epsilon}_t] = \hat{\mu}_t^A = \hat{\epsilon}_t \left(\frac{\lambda^A}{(\lambda^A)^2 + \phi^A} \right) = (\epsilon_t + d_t - \tilde{d}_t) \left(\frac{\lambda^A}{(\lambda^A)^2 + \phi^A} \right) \quad (7.32)$$

$$E_t[\mu_t^B | \hat{\epsilon}_t] = \hat{\mu}_t^B = \hat{\epsilon}_t \left(\frac{\lambda^B}{(\lambda^B)^2 + \phi^B} \right) = (\epsilon_t + d_t - \tilde{d}_t) \left(\frac{\lambda^B}{(\lambda^B)^2 + \phi^B} \right) \quad (7.33)$$

As opposed to the previous chapters, parties in this model form coalitions. An election can thus no longer be about simply gaining a majority of the seats. In a majoritarian system, the party with the largest vote share is set to form the government.

Yet in a setting where a party cannot govern alone, the government formation is a bargaining process whereby the ‘freedom of elite bargainers to depart from the voters’ choice’ makes the final outcome to an extent probabilistic.⁵⁶ The model thus has to account for the probabilistic outcomes of government formation. In this model it will thus no longer be assumed that parties maximise their probability of re-election. Rather, they maximise their vote share. This specification seems reasonable in a coalition setting if one assumes that the vote share is related to the portfolio share, as stipulated by Gamson’s Law.⁵⁷

The probability of joining a coalition government is still likely to affect the government’s incentives: a large vote share only translates into a large portfolio share if the party gets into power. This probability of joining the government is not necessarily a function of the vote share. For this reason, the model will include a separate parameter, ν , which is assumed to be exogenous. It represents a party’s probability of joining a coalition. This probability could be derived from historical trends or from the bargaining strength of a party (e.g. the extent to which a party is pivotal). With the help of equations 7.6 and 7.30 for election period t and post-election period $t + 1$, the governing party A ’s optimisation problem can be expressed as follows:

$$\begin{aligned} \max_d \quad & E_t[\tau^* + d_t + \eta_t + u(y - \tau^*) + \lambda X] \\ & + E_t[\tau^* - R(d_t) + \eta_{t+1} + u(y - \tau^*)] \\ & + (\epsilon_t + d_t - \tilde{d}_t) \left(\frac{(q+1)}{2} \left(\frac{\lambda^A}{(\lambda^A)^2 + \phi^A} \right) - \frac{1}{2} \left(\frac{\lambda^B}{(\lambda^B)^2 + \phi^B} \right) \right) \nu X] \end{aligned} \quad (7.34)$$

⁵⁶Powell Jr. (2000) (as in n. 29), p. 203.

⁵⁷Gamson (1961) (as in n. 28).

The solution to this optimisation problem is

$$1 + \left(\frac{(q+1)}{2} \left(\frac{\lambda^A}{(\lambda^A)^2 + \phi^A} \right) - \frac{1}{2} \left(\frac{\lambda^B}{(\lambda^B)^2 + \phi^B} \right) \right) \nu X - R'(d^*) = 0 \quad (7.35)$$

For the two-party case, where $\lambda^A = \lambda$ and $\lambda^B = (1 - \lambda)$, this reduces to:

$$1 + \left(\frac{(q+1)}{2} \left(\frac{\lambda}{\lambda^2 + (1-\lambda)^2} \right) - \frac{1}{2} \left(\frac{1-\lambda}{(1-\lambda)^2 + \lambda^2} \right) \right) \nu X - R'(d^*) = 0 \quad (7.36)$$

The comparative statics with respect to the share in government, λ are:

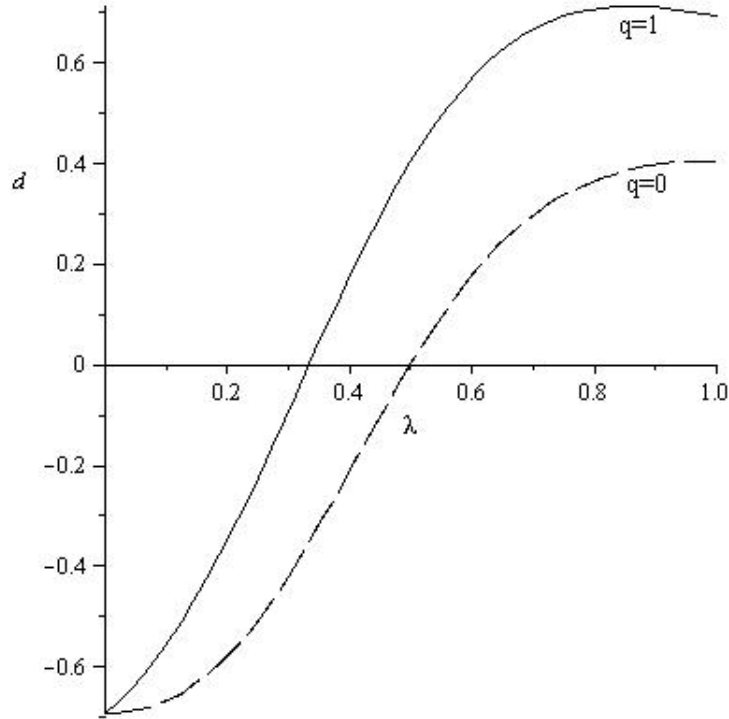
$$\frac{\partial d^*}{\partial \lambda} \begin{cases} > 0, & \text{if } q = 0 \text{ or } q = 1 \& \lambda < (\frac{1}{3} + \frac{1}{6}\sqrt{10}) \\ < 0, & \text{if } q = 1 \& \lambda < (\frac{1}{3} + \frac{1}{6}\sqrt{10}) \end{cases} \quad (7.37)$$

This means that for most values of λ the optimal deficit increases as the share in government increases. Only when λ gets relative close to unity, the optimal deficit may decrease as the party's share in government gets larger.

$$d^* \begin{cases} > 0, & \text{if } q = 1 \& \lambda > \frac{1}{3} \text{ or } q = 0 \& \lambda > \frac{1}{2} \\ < 0, & \text{if } q = 1 \& \lambda < \frac{1}{3} \text{ or } q = 0 \& \lambda < \frac{1}{2} \end{cases} \quad (7.38)$$

The relationship is intuitive. If party A is located between the other two parties, i.e. $q = 1$, a positive competence will always result in a vote gain from party C 's supporters, since the opposition party's competence shock is expected to be zero. The smaller the party gets, the larger becomes the difference in expected competence shocks for the two coalition parties. At a certain value of λ , party A loses more votes to party B than it gains from party C . In this case, it would prefer a *negative* aggregate competence shock in order to appear *less 'incompetent'* than party A . The value where the votes gained equal the votes lost is $\lambda = \frac{1}{3}$. If party B is between parties A and B , i.e. $q = 0$, party A can only gain votes from party B . Yet it can only gain votes if it has a larger share in government than party B because then voters will attribute a larger share of the government's competence shock to party A . This value is at $\lambda = \frac{1}{2}$ where both parties are equally strong. However, independent of the party's position in the policy space, it follows clearly that larger parties have a greater incentive to appear competent. This is the main finding of the analysis and can be summarised in the following core proposition:

Figure 7.5: Share in government and the optimal deficit



Proposition 7.1. *Comparative statics of equilibrium pre-electoral deficit*

- a) *For most values of the portfolio share λ (i.e. when $\lambda < \frac{1}{3} + \frac{1}{6}\sqrt{10}$), the equilibrium deficit, d^* , increases in λ*

7.4 Discussion

The model provides a good illustration of the incentives for individual coalition partners to increase the deficit before elections, highlighting the role of a party's size. However, the model provides further insights. Although it is worthwhile discussing these insights, it should be noted that they were not derived from first principles and were introduced as exogenous factors to make the model realistic. Moreover, the focus of the argument is on signal extraction. These insights should thus be only treated as subsidiary.

Turning again to figure 7.5, it is apparent that the effect of the parameter q is positive. Indeed, it can be shown formally from equations 7.35 or 7.36 that

$$\frac{\partial d^*}{\partial q} > 0 \quad (7.39)$$

This makes intuitive sense because q captures the probability that a party can win votes from the opposition. The more likely a party is to be in this position, the more it can gain from feigning competence. Lastly, one can examine the effect of the exogenous probability of joining a coalition, ν , on the equilibrium deficit. From equations 7.35 or 7.36 it must hold that

$$\frac{\partial d^*}{\partial \nu} \begin{cases} > 0, & \text{if } q = 0 \& \lambda > \frac{1}{2} \quad \text{or} \quad q = 1 \& \lambda > \frac{1}{3} \\ < 0, & \text{if } q = 0 \& \lambda < \frac{1}{2} \quad \text{or} \quad q = 1 \& \lambda < \frac{1}{3} \end{cases} \quad (7.40)$$

Although this relationship may seem counter-intuitive at first sight, it seems reasonable upon closer inspection. As has been established above, larger parties can win votes not just from the opposition but also from smaller opposition parties. A small governing party, that is likely to lose votes from competence signaling, will be opposed to deficits before elections. The greater the likelihood is to be part of a coalition government, the more painful it will be for smaller parties to see their seat share - and correspondingly portfolio share - shrink. Large parties, on the other hand, benefit from competence signaling. The more likely they are to join a coalition the higher a cost are they willing to incur in order to increase their portfolio share in government. These findings can be summarised in the following, subsidiary, propositions:

Proposition 7.1. *Comparative statics of equilibrium pre-electoral deficit*

- b) *The equilibrium deficit, d^* , increases in the ability to affect the vote choice of opposition supporters, q .*
- c) *The equilibrium deficit, d^* , increases in the probability of joining a coalition, ν , only if the expected gain in the vote share is positive; it decreases if the expected gain is negative.*

7.5 Empirical Implications

The core insight of the above model is captured by proposition 7.1a), summarising the incentives for electioneering for individual coalition partners. How will these incentives be reflected in policy? There are two ways of answering this question. First, coalition partners share the competence signal. Thus, even if both parties have the same size and voters attribute an equal share of responsibility for expenditure shocks to the two parties, a vote

can only be cast for one party.⁵⁸ For this reason the benefit from electioneering is smaller under coalition government.⁵⁹ Accordingly, coalition governments have a smaller incentive to increase the deficit before elections than single party governments. This can be summarised in empirical hypothesis *H7.1*:

H7.1: Political budget cycles are smaller under coalition than single-party government.

Second, the larger coalition partners are more likely to influence policy than smaller parties. As was argued above, larger parties tend to be more powerful. They are more likely to be chosen as the formateur for coalitions, giving them considerable bargaining power. Moreover, as stipulated by Gamson's Law, they are more likely to have more (and/or more powerful) cabinet portfolios.⁶⁰ This should give large parties considerable clout over policy, especially when policy is decided unanimously. Even if decision-making is unanimous, larger parties may have an incentive to breach this convention. Shortly before an election when decisions on electioneering are made, the continuation of the coalition is close to zero. For that reason, large parties have little incentive to consider the interests of other coalition partners. This effect is likely to be particularly strong under weak fiscal centralisation, as discussed by Persson and Tabellini.⁶¹ In this case, individual departments can implement their desired policies with few constraints from other coalition members. This would allow parties to virtually implement their preferred policy which would result in a policy that would resemble a simple addition of the equilibrium deficit of each coalition partner. Thus, the deficit can be expected to increase in the size of the largest party in government, i.e. the party that benefits most from feigning competence. This can be summarised in empirical hypothesis *H7.2*:

H7.2: The magnitude of political budget cycles increases with the size of the largest coalition member.

⁵⁸Even if the ballot structure is more flexible and allows for a separate party and candidate vote, as in Italy and Germany, or in the case of a single transferrable vote structure, as in Ireland, voters will have to give more weight to some parties than others.

⁵⁹This compares to Duch and Stevenson's argument that the competence signal is suppressed under coalition government. See Duch and Stevenson (2008) (as in n. 15).

⁶⁰Gamson (1961) (as in n. 28).

⁶¹Persson and Tabellini (2000) (as in n. 38), pp. 348-349.

It should be noted that since ‘size’ is essentially a measure of a party’s degree of power over fiscal policy, there are multiple ways of construing this index: it can be a party’s vote/seat share which is then likely to translate into portfolios which give a party direct power over public expenditure. Or it can be related more directly to a party’s bargaining power, which is then likely to translate into portfolios. The next chapter, chapter 8, will further discuss several ways of operationalising these key factors in order to test hypothesis *H7.2*.

7.6 Conclusion

How does coalition government affect the magnitude of political budget cycles? This chapter has taken a first step toward answering this question by examining the incentives of individual coalition partners to increase the deficit before an election. The argument in this chapter draws on several strands of the political economy literature, as was illustrated with reference to a ‘democratic circle’, which breaks the democratic process into five stages from voters, to parties, to government, to policies, and back to voters. This chapter has integrated insights from all these stages, yet it was acknowledged that a few simplifications had to be made to reduce the complexity of a model with so many relevant factors.

The model in this chapter focuses in particular on the problem of signal extraction under coalition government. It shows that larger coalition members benefit more from electioneering and thus have a stronger preference for pre-electoral debt than smaller members. This is the main theoretical finding of this chapter. However, more interesting insights could be derived from the model. First, more centrist parties will find it easier to appeal to swing-voters. Thus, these parties will have a greater incentive to feign competence before elections. Second, parties that are pivotal, in other words that have a relatively high *ex-ante* probability of joining coalitions governments have an incentive to borrow if they are relatively large. If they are smaller, they would only receive a small share of the credit for boosts in government competence which makes it relatively less attractive for these parties to borrow strategically. These findings, however, should only be considered subsidiary.

Theoretical insights can be valuable in its own right, however, their value is significantly increased when it can be shown that they have practical relevance. For this reason, ways were discussed in which coalition incentives may be aggregated to result in a unified government policy. The emphasis was in particular on the main finding of the theoretical model which relates to the size of a coalition party and its consequences for signal extraction. It was thus

hypothesised that political budget cycles will be smaller under coalition than single-party government. Moreover, for the case of a governing coalition, the magnitude of a political budget cycle can be expected to increase in the size of the largest coalition partner. These hypotheses will be tested in the next chapter.

7.7 Appendix

1) Optimal Tax Rate

The government's maximisation problem from equations 7.8 and 7.9 can be re-stated as:

$$\max_{\tau} \quad E_t[g_t + u(c_t) + \lambda^j X] \quad (\text{A-7.1})$$

$$s.t. \quad g_t = \tau_t + \eta_t \quad (\text{A-7.2})$$

Note that from equation 7.6 it holds that $\eta_t = \sum_{j=1}^k \lambda^j \mu_t^j + \sum_{j=1}^k \lambda^j \mu_{t-1}^j = \epsilon_t + \epsilon_{t-1}$, which shows that competence is independent of the tax rate. The first order condition is:

$$\begin{aligned} \frac{\partial g_t}{\partial \tau} + \frac{\partial u(c_t)}{\partial \tau} &= \frac{\partial(\tau_t + \eta_t)}{\partial \tau} + \frac{\partial u(y - \tau_t)}{\partial \tau} = 1 - u_c(y - \tau_t) = 0 \\ \rightarrow 1 &= u_c(y - \tau_t) \quad \rightarrow u_c^{-1}(1) = y - \tau_t \\ \rightarrow \tau_t &= \tau^* = y - u_c^{-1}(1) \end{aligned} \quad (\text{A-7.3})$$

2) Conditional expectation⁶²

The overall competence shock, ϵ , is the weighted sum of each party's competence shocks, μ . Weights are denoted by λ . Both competence shocks and weights are indexed by coalition member $j = 1, 2, \dots, k$.⁶³ The overall competence shock can then be expressed as:

$$\epsilon = \lambda_1 \mu_1 + \lambda_2 \mu_2 + \dots + \lambda_k \mu_k = \sum_{j=1}^k \lambda_j \mu_j \quad (\text{A-7.4})$$

Since the weights correspond to each coalition member's share in government, the sum of the weights has to equal one.

$$\sum_{j=1}^k \lambda_j = 1 \quad (\text{A-7.5})$$

It is assumed that all competence shocks are distributed normally with mean m and variance s^2 . It is further assumed that these distributional assumptions equally hold for all coalitions

⁶²This derivation largely builds on Gelman, Andrew et al. (2004) *Bayesian Data Analysis: Texts in Statistical Science*, Volume 25, 2nd edition. London: Chapman & Hall/CRC, p.668.

⁶³For notational clarity, indices for coalition members are represented by subscripts rather than superscripts and time indices are dropped.

members. Amongst coalition members competence shocks are independent.

$$\mu_j \stackrel{iid}{\sim} N(m, s^2) \quad (\text{A-7.6})$$

Given this specification, voters can form a Bayesian estimate of each coalition member's individual competence shock μ_k , when they observe the aggregate shock ϵ . The posterior probability distribution of an individual competence shock, μ , given the realisation of the aggregate shock, ϵ can be calculated by multiplying the prior probability distribution $p(\mu)$ by the likelihood function $p(\epsilon|\mu)$, and then dividing by the normalizing constant, $p(\epsilon)$:

$$p(\mu|\epsilon) = \frac{p(\mu)p(\epsilon|\mu)}{p(\epsilon)} \quad (\text{A-7.7})$$

$$\propto p(\mu)p(\epsilon|\mu) \quad (\text{A-7.8})$$

Equation A-8 indicates that omitting the normalising constant implies that the product of the prior probability distribution and the likelihood function is *proportional* to the posterior probability distribution. This is an important property for the following analysis. Observation ϵ represents the government's aggregate competence shock; μ on the other hand is the competence shock of an individual governing party that the voter aims to estimate using Bayesian updating. For the following analysis, μ will be the competence shock of coalition partner $k = 1$. To specify the likelihood function of $\epsilon|\mu$, it is necessary to derive the conditional expectation $E[\epsilon|\mu]$ and the conditional variance $Var[\epsilon|\mu]$. The conditional expectation can be calculated as:

$$E[\epsilon|\mu] = \lambda\mu + \lambda_2m + \dots + \lambda_km = \lambda\mu + m \sum_{j=2}^k \lambda_j \quad (\text{A-7.9})$$

Note that equation A-5 can be expressed as:

$$\lambda + \sum_{j=2}^k \lambda_j = 1 \Leftrightarrow \sum_{j=2}^k \lambda_j = 1 - \lambda \quad (\text{A-7.10})$$

Substituting equation A-10 into A-9 simplifies to:

$$E[\epsilon|\mu] = \lambda\mu + m(1 - \lambda) \quad (\text{A-7.11})$$

The conditional variance can be expressed as:

$$Var(\epsilon|\mu) = \lambda_2^2 s^2 + \lambda_3^2 s^2 + \dots + \lambda_k^2 s^2 = s^2 \sum_{n=2}^k \lambda_k^2 \quad (\text{A-7.12})$$

For simplicity let $\sum_{k=2}^n (\lambda^k)^2 = \phi$. This allows to express the posterior probability distribution of μ in equation A-7.8 as:

$$\begin{aligned} p(\mu|\epsilon) &\propto \exp\left(-\frac{1}{2s^2}(\mu - m)^2\right) * \exp\left(-\frac{1}{2Var(\epsilon|\mu)}(\epsilon - (E[\epsilon|\mu]))^2\right) \\ &= \exp\left(-\frac{1}{2s^2}(\mu - m)^2\right) * \exp\left(-\frac{1}{2s^2\phi}(\epsilon - (\lambda\mu + (1-\lambda)m))^2\right) \end{aligned} \quad (\text{A-7.13})$$

Expanding equation A-7.13 and collecting terms yields:

$$\begin{aligned} p(\mu|\epsilon) &\propto \exp\left(-\frac{1}{2}\left(\frac{(\lambda^2 + \phi)\mu^2 - 2(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)\mu}{s^2\phi} + \frac{\lambda^2 m^2 - 2\epsilon m + \phi m^2 + \epsilon^2 + 2\epsilon\lambda m - 2\lambda m^2 + m^2}{s^2\phi}\right)\right) \end{aligned} \quad (\text{A-7.14})$$

$$= \exp\left(-\frac{1}{2}\frac{(\lambda^2 + \phi)\mu^2 - 2(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)\mu}{s^2\phi} + c\right) \quad (\text{A-7.15})$$

$$\propto \exp\left(-\frac{1}{2}\frac{(\lambda^2 + \phi)\mu^2 - 2(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)\mu}{s^2\phi}\right) \quad (\text{A-7.16})$$

The elements that are summarised by the placeholder c in equation A-14 are part of the normalising constant. Omitting this constant in equation A-16 leaves the remaining elements proportional to the posterior probability distribution. Multiplying and dividing equation A-16 by $\frac{s^2\phi}{\lambda^2 + \phi}$ yields:

$$p(\mu|\epsilon) \propto \exp\left(-\frac{1}{2}\left(\frac{\lambda^2 + \phi}{s^2\phi}\right)\left(\mu^2 - \frac{2(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)\mu}{(\lambda^2 + \phi)}\right)\right) \quad (\text{A-7.17})$$

Completing the square yields:

$$p(\mu|\epsilon) \propto \exp\left(-\frac{1}{2}\left(\frac{\lambda^2 + \phi}{s^2\phi}\right)\left(\mu - \frac{(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)}{(\lambda^2 + \phi)}\right)^2\right) \quad (\text{A-7.18})$$

The posterior mean is

$$\begin{aligned} E[\mu|\epsilon] &= \left(\frac{(\epsilon\lambda + \phi m - \lambda m + \lambda^2 m)}{(\lambda^2 + \phi)}\right) \\ &= \left(\frac{\epsilon\lambda}{(\lambda^2 + \phi)} + \frac{m(\phi - \lambda + \lambda^2)}{(\lambda^2 + \phi)}\right) \end{aligned} \quad (\text{A-7.19})$$

, where $\phi = \sum_{j=2}^k \lambda_j^2$. It is normally distributed with variance $\left(\frac{\lambda^2 + \phi}{s^2 \phi}\right)^{-1}$.

Chapter 8

Coalition Government II

8.1 Introduction

A general election was held in the Netherlands on the 22nd November 2006. Shortly before voters went to the polls, Prime Minister Peter Balkenende visited a hospital in Leiden, to promise substantial additional health spending.¹ This was largely perceived as pandering to elderly voters. However, as this thesis has argued, promises are not actions and, in fact, the Dutch budget deficit of 2006 *declined* by 0.9% compared to the previous year.² One year and two days later, Australia held a general election, on the 24th November 2007. The *Financial Times* pointed out that in that year Prime Minister John Howard's government expanded the defence budget to a record, gave one-off handouts to senior citizens and announced additional childcare subsidies.³ As compared to Balkenende's promises, Howard turned to actions and generously handed out election gifts. The Australian budget deficit *increased* by 0.5%.

In what way do these Dutch and Australian examples differ? Both governments were coalition governments. Yet in Balkenende's cabinet, parties were of similar strength: the largest party in government, the Christian-Democratic CDA, only had 1.5 as many seats as the second party, the liberal VVD. Of the two Australian governing parties, the Liberals were eight times as strong as the Nationals. Surely, these examples are purely anecdotal. However, they illustrate the argument put forward in the previous chapter, chapter 7: a coalition party's size is a key determinant of its incentive to borrow strategically before elections. This chapter will go beyond anecdotal evidence and explore the theoretical relationships derived in the previous chapter empirically for a sample of 61 countries, both from the developed and developing world. The hypothesis from the previous chapter can be re-stated (and will be re-numbered) as follows:

H8.1: Political budget cycles are smaller under coalition than single-party government.

H8.2: The magnitude of political budget cycles increases in the size of the largest coalition member.

The first hypothesis, *H8.1*, results from the fact that in a coalition government, parties share responsibility. Chapter 7 has argued that when responsibility is shared, individual parties

¹Bickerton, Ian (2006) Dutch Premier Looks to the Economy for Magic Formula, *The Financial Times* 22 November.

²Data on budget deficits in this section were taken from the IMF's 2009 *World Economic Outlook*.

³Marsh, Virginia (2007) Howard Woos Families with Tax-Cut Budget, *The Financial Times* 9 May.

are likely to gain less from shocks to their competence as voters will attribute a fraction of this shock to other coalition partners. For this reason, the incentive to increase the deficit before elections is dampened. This prediction should be relatively independent from the size of the parties in government and will thus be tested individually. In a second stage, when testing hypothesis *H8.2*, the analysis will be further refined to look specifically at party size. To this end, the analysis will turn to the vote share of the largest party, the distance in vote shares between the first and second party, and the bargaining power of the largest party. At least for the first two indicators, the empirical results are rather strong. For bargaining powers the results are feeble, which may largely be due to a significantly smaller sample size than for the other two indicators.

The analysis will consist of a main analysis which includes indicators that maximise the sample size, in other words the variables based on vote share. For the bargaining power index with a much smaller sample size, a subsidiary analysis will be conducted. The remainder of this chapter will largely follow this distinction of a main and a subsidiary analysis, both when the chapter discusses the data in section two and presents the results in section four. In section three, the estimation procedure will be explained in more detail. The last section, section five, concludes.

8.2 Data

The analysis will pursue two different approaches. The main analysis focuses on coalition government and the size of the largest party. A subsidiary analysis will turn to a measure of bargaining power. The analysis is subsidiary because it builds on a different dataset that contains significantly fewer countries; whilst the main analysis includes up to 61 countries, the subsidiary analysis only contains 17, not even a third of the main analysis. Moreover, all of these countries are developed. As several studies have shown, political budget cycles are more difficult to detect in developed countries - a weaker political budget cycle is likely to reduce the statistical strength of the hypothesised relationship.⁴

8.2.1 Main Analysis

The dependent variable for the analysis, as in the previous chapters, is the budget balance

⁴See in particular Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9.

as a percentage of GDP. There are two potential sources for data: the dataset assembled by Brender and Drazen and the IMF's *2009 World Economic Outlook*, as employed in chapters 5 and 6.⁵ The analysis will mainly employ Brender and Drazen's data because they encompass more countries and longer time series. One important drawback, however, is that their time series only extend to 2001. For this reason, the IMF data, which are available up to 2008, will be used for robustness purposes.

The main independent variables are a dummy measure for coalition governments and an interval measure for the size of the largest party in government. Both variables can be constructed with the help of the World Bank's *Database of Political Institutions* (DPI).⁶ The database (in its updated 2006 version) contains data on the vote share and number of legislative seats of the first three largest governing parties; both measures are also available for a catch-all variable incorporating smaller coalition members. These variables lend themselves to constructing an index of whether a government contains a single party or multiple parties. The coalition dummy is thus coded as zero when there are no other governing parties and one otherwise.

The most natural measure of the size of the largest party is the vote share of the largest party in government. The number of seats is a potential alternative contender. Its advantage over the vote share is that in some countries, in particular those with plurality elections, the vote share does not always directly translate into seats - and seats eventually determine a party's strength in parliament. However, vote share and seats are strongly correlated. The main drawback of using the seats variable is that its size depends on the overall number of seats in the legislature. To facilitate the comparison across countries, the vote share, which is a percentage of the votes cast in an election, is more appropriate. For this reason, the analysis will focus on the vote share of the largest party.⁷

To check the robustness of the findings, the variable will also be coded as a *fraction* of the government's overall vote share, a variable that is also available from the DPI. Looking at the fraction of the vote share only compares the size of the largest party relative to other governing parties. This will not be the main variable in the analysis because the absolute size in the legislature seems to be important. The literature has established that opposition parties can have considerable influence on policy.⁸ It therefore seems reasonable to look

⁵Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

⁶Beck, Thorsten et al. (2001) New Tools in Comparative Political Economy: The Database of Political Institutions, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

⁷A third possibility is to construct a measure of the largest party's seat *share* - yet due to a relatively large number of missing observations for individual parties's seat shares, this measure will not be used in the analysis.

⁸See, e.g., Powell Jr., G. Bingham (2000) *Elections as Instruments of Democracy: Majoritarian and Pro-*

at the whole legislature when determining the size of the largest party, thus concentrating on the absolute vote share. Yet, the absolute and relative vote share measures are highly related, with a correlation coefficient of 0.61, which is why the empirical findings turn out to be rather similar.

A second operationalisation of the size of the largest party will be used. The theoretical model shows that larger parties benefit more from shocks to overall government competence than smaller parties. For this reason the vote share of the largest party is the main variable. However, the model indicates that the larger the main party in a coalition is *relative* to the other parties, the more it will benefit. Therefore, the second operationalisation focuses on the difference in vote shares between the first and second largest parties. The larger this difference is, the more the main party will be credited with the overall competence shock and the larger is the incentive to borrow. The variable is based on the vote share variables for the first and second party from the DPI.

It should be noted that the analysis includes both parliamentary and presidential democracies. In the parliamentary case, governing parties are those parties that hold ministries and different parties can hold different ministries in the coalition case. In presidential regimes, elections are essentially for one position, or as Lijphart puts it: “ The party that wins the presidency wins ‘all’ of the seats - that is, the one seat that is available [...]”⁹ If parties are relatively small, alliances can form where multiple parties support one presidential candidate.¹⁰ The parties that are aligned with the president are counted as coalition members.

Another key variable is a dummy for election years, as in the analyses of previous chapters. The election variable employed by Brender and Drazen will be the main election measure (as in chapter 4). However, additional measures are required, partly to provide more accurate tests of the theoretical hypothesis and partly to test the robustness of the findings. Firstly, the sample contains parliamentary and presidential regimes. As argued above, electoral competition in these two regime types differs. Recalling Lijphart’s words above, even though several parties may compete for the presidency, executive power is held by only one party. For this reason, voters will likely reward this one party disproportionately for positive competence shocks compared to aligned legislative parties. To test the mettle of the theory for parliamentary and presidential regimes separately, the election dummy will be

portional Visions, New Haven, CT: Yale University Press; Primo, David M. and Snyder Jr, James M. (2010) Party Strength, The Personal Vote, and Government Spending, *American Journal of Political Science*, Vol. 54, No. 2.

⁹Lijphart, Arend (1999) *Patterns of Democracy: Government Forms and Performance in 36 Countries*, New Haven, CT: Yale University Press, p. 161.

¹⁰Cheibub, José A. and Limongi, Fernando (2002) Democratic Institutions and Regime Survival: Parliamentary and Presidential Democracies Reconsidered, *Annual Review of Political Science*, Vol. 5, No. 1.

split into two variables, one capturing presidential and the other parliamentary elections.¹¹ The measure is based on the DPI's classification of regime types. It should be noted, that the few semi-presidential regimes in the sample will be coded as parliamentary; the results, however, are robust to coding them as presidential.

In many countries, a second chamber has significant co-governing power. Second chambers are particularly likely in federal system, such as the United States and Germany.¹² However, centralised states, like the United Kingdom, can also have a second chamber. As Tsebelis shows, second chambers can act as veto players and bias policy toward the status quo.¹³ Another important veto player is a legislature in presidential regimes, if it is dominated by parties that are not aligned with the president. A typical example is divided government in the United States. In these cases, governments may find it more difficult to enact policy without the support of these veto players. For this reason, the election variable will also be recoded in a way that it assumes a value of one only if the government controls both the executive and the legislative arm (or arms if there are two chambers) of government. The DPI contains a variable ('allhouse') which facilitates this coding of this election indicator under unified government, *unified*.

The theory is one about coalition government. Therefore, the election dummy will also be re-coded, for an alternative measure, in such a way that only those elections are coded as one which were contested by a coalition government. The coding will be based on the measure for coalition government described above. Essentially, all elections are re-coded as zero when the DPI measure for the second governing party's vote share is larger than zero. This measure of elections under coalition government will be further extended. The theory is essentially one on majority coalitions. In some cases, governing coalitions do not in fact command the majority of seats in the legislature. In these cases, electoral manipulation will be more difficult since non-governing parties are unlikely to support electioneering. The election dummy for coalition government will thus be coded as zero if the coalition does not command a majority of the seats in the legislature. Whether or not a government is a majority coalition is based on the DPI's variables that contain the seat numbers for the government and opposition respectively.

Having specified the key variables for the main analysis, it is important to discuss statis-

¹¹This coding strategy of the election dummy is consistent with an approach adopted by Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 5).

¹²Lijphart (1999) (as in n. 9).

¹³Tsebelis, George (1995) Decision Making in Political Systems: Veto Players in Presidentialism, Parliamentarism, Multicameralism and Multipartyism, *British Journal of Political Science*, Vol. 25, No. 3; Tsebelis, George (2002) *Veto Players: How Political Institutions Work*, Princeton, NJ: Princeton University Press.

tical controls. As in all previous empirical analyses, the output gap and natural logarithm of GDP per capital will be controlled for. These variables are standard controls in the study of political budget cycles.¹⁴ The main variables of interest are institutional variables, and therefore it is important to control for other institutional features. Firstly, the DPI's *unified* variable, mentioned above, will be included in the analysis to control for the government's ability to make policy. If the variable is coded as one, the government has a high degree of policy authority and may be more likely to engage in electioneering. Secondly, a measure of fractionalisation will be included to control for the number of potential alternative coalition partners. As the model in the previous chapters shows, the likelihood of being in government is correlated with the incentives for electoral manipulation. The more parties there are, the more likely it may be that a party will join one coalition constellation. The analysis will employ the DPI's fractionalisation variable which measures the probability that two parliamentarians picked at random will be from different parties.

Lastly, two variables will be controlled for that Persson and Tabellini find to have an important impact on budget deficits: regime type and the electoral formula.¹⁵ As argued above, incentives may differ in presidential systems. For this reason, and in accordance with the coding for the presidential election dummy, a dummy variable will be included that controls for presidential government. With respect to the electoral formula, a variable will be included that is coded as one for proportional representation (PR) and zero otherwise. Both variables are taken from the DPI. All institutional variables are lagged by one period in election years to ensure that the values correspond to the government contesting the election.

8.2.2 Subsidiary Analysis

There is an alternative way of thinking about the size of the largest party, not in terms of vote share but rather in terms of bargaining strength. There is an argument in the literature that the vote share only poorly measures a party's power.¹⁶ A larger party is likely to have a bigger claim on the number of portfolios and is also likely to have more

¹⁴See, e.g. Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 5); Shi and Svensson (2006) *Journal of Public Economics* (as in n. 4); Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3.

¹⁵Persson, Torsten and Tabellini, Guido E. (2003) *The Economic Effects of Constitutions*, Cambridge, MA: MIT Press; Persson, Torsten and Tabellini, Guido E. (2004a) Constitutional Rules and Fiscal Policy Outcomes, *The American Economic Review*, Vol. 94, No. 1.

¹⁶Sutter, Matthias (2000) Flexible Integration, EMU and Relative Voting Power in the EU, *Public Choice*, Vol. 104, No. 1; Huber, Gerald, Kocher, Martin and Sutter, Matthias (2003) Government Strength, Power Dispersion in Governments and Budget Deficits in OECD-Countries: A Voting Power Approach, *Public Choice*, Vol. 116, No. 3.

clout in making policy. However, in coalition negotiations smaller parties may get more portfolios, or unusually powerful portfolios, than proportionality would require if they are pivotal. Smaller parties can thus bear a larger degree of policy responsibility than the vote share would imply. Duch and Stevenson show that voters give a greater weight to pivotal parties in evaluating government policy.¹⁷ Thus, a measure of the degree to which a party is pivotal is a strong contender to the vote share measure. The subsidiary analysis will employ such a measure.

Two main approaches to measuring bargaining strength can be found in the literature, one index suggested by Shapley and Shubik and one by Banzhaf.¹⁸ Felsenthal and Machover argue that the Banzhaf index is a more appropriate measure of the relative power of parties *vis-à-vis* each other. Accordingly, the Banzhaf index has been the predominant measure of bargaining power in the literature.¹⁹ The Banzhaf index will thus be used in the subsidiary analysis.

Banzhaf does not actually derive a mathematical formula to calculate the index.²⁰ Huber *et al.* explain the construction of the Banzhaf index as follows:²¹

Consider a set of players $N = \{1, 2, \dots, n\}$, where player i has voting weight w_i . Let Ω be the set of all possible coalitions S which can be formed out of N . [...] A winning coalition $S \in \Omega$ is characterized by $\sum_{j \in S} w_j \geq q$, where q denotes the majority requirement. If a coalition S is a winning coalition, the value v of this coalition is defined as one, since S can determine the outcome of a vote. All losing coalitions are assigned a value of $v = 0$ accordingly. To determine player i 's voting power, consider all coalitions where player i has a swing, meaning that player i is crucial for turning a losing coalition into a winning one. Player i has a swing if $\sum_{j \in S/\{i\}} w_j < q$, but $\sum_{j \in S/\{i\}} w_j \geq q$.

The Banzhaf index measures bargaining strength in that it indicates how many oppor-

¹⁷Duch, Raymond M. and Stevenson, Randolph T. (2008) *The Economic Vote: How Political and Economic Institutions Condition Election Results*, Cambridge: Cambridge University Press.

¹⁸Shapley, Lloyd S. and Shubik, Martin (1954) A Method for Evaluating the Distribution of Power in a Committee System, *The American Political Science Review*, Vol. 48, No. 3; Banzhaf III, John F. (1964) Weighted Voting Doesn't Work: A Mathematical Analysis, *Rutgers Law Review*, Vol. 19 For a precursor of the Banzhaf index see Penrose, Lionel S. (1946) The Elementary Statistics of Majority Voting, *Journal of the Royal Statistical Society*, Vol. 109, No. 1.

¹⁹See in particular Huber, Kocher and Sutter (2003) (as in n. 16); Strøm, Kaare, Kaare, Müller, Wolfgang C. and Bergman, Torbjörn (2008) *Cabinets and Coalition Bargaining: The Democratic Life Cycle in Western Europe*, Oxford: Oxford University Press.

²⁰Banzhaf III (1964) (as in n. 18).

²¹Huber, Kocher and Sutter (2003) (as in n. 16), p.337.

tunities a party has to join a coalition. The more it serves as a coalition-maker, the more pivotal a party is and the more concessions it is likely to extract in coalition negotiations. The formula for party i 's Banzhaf index, β_i , can then be expressed as:

$$\beta_i = \frac{\sum_{S \subset \Omega} [v(S) - v(S/\{i\})]}{2^{n-1}} \quad (8.1)$$

, where the denominator represents the total number of possible coalitions. Data for the Banzhaf index were obtained from the *Comparative Parliamentary Data Archive* (CPDA), which provides an amplitude of data on coalition government for 17 countries between 1960 and 1998.²²

The dependent variable in this subsidiary analysis will be the same as in the main analysis, i.e. the budget balance, taken from Brender and Drazen's comprehensive dataset.²³ The IMF's *2009 World Economic Outlook* is not a viable alternative in this case, because time series only begin in 1980, which would mean losing almost half of the observations for which the Banzhaf index is available. The election dummy will also be taken from the Brender and Drazen dataset. It will be amended in a similar way as in the main analysis to exclude elections contested by a single-party or minority coalition government. However, DPI data cannot be used for the re-coding because they are only available from 1975, again resulting in significant data loss. Instead, a coalition and minority coalition indicator from the CPDA will be used.

Since the DPI data do not cover the entire CPDA time series, alternative control variables will be employed, all directly taken from the CPDA. To measure fractionalisation, a measure of bargaining power fragmentation will be employed. Given that the main variable of interest is bargaining power rather than vote share, this adaptation seems particularly suited. To control for policy autonomy, a dummy for a second chamber will be included. The sample only includes parliamentary and semi-presidential democracies; for this reason instead of controlling for presidentialism, the analysis will control for semi-presidentialism. As in the main analysis, a dummy variable will be included for proportional representation.

Lastly, the CPDA allows to control for two further factors that are interesting in the case of coalition government and may have an impact on intra-coalition bargaining. These variables measure 1) whether the coalition is built on a Comprehensive Policy Agreement, and 2) whether the coalition is an ideologically connected cabinet. All variables and their

²²Strøm, Müller and Bergman (2008) (as in n. 19).

²³Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 5).

names, both for the main and the subsidiary analysis are listed in table 8.1. A list of countries included in the respective analyses, as well as descriptive statistics for all variables can be found in the appendix.

Table 8.1: List of variables

Main analysis	
Single Party	Single party government? 1=Yes
Largest Party	Vote share of the largest party in government (%)
Distance(1-2)	Lead of first over second party in government (%)
Elect	Election dummy
Balance (L1)	Lagged budget balance (% of GDP)
Output Gap	Output gap
LnGDP	Log GDP per capita
Unified	Executive controls all legislative chambers? 1=Yes
Fraction	Party system fractionalisation
PR	Proportional representation? 1=Yes
Presidential	Presidential system? 1=Yes
Subsidiary analysis	
Banzhaf	Banzhaf index of the largest party in government
Elect	Election dummy
Balance (L1)	As in main analysis.
Output Gap	As in main analysis.
LnGDP	As in main analysis.
Chamber	Second chamber? 1=Yes
Fragment	Bargaining power fragmentation
PR	As in main analysis
Semi-Pres.	Semi-presidential system? 1=Yes
PolicyAgree	Comprehensive policy agreement? 1=Yes
ConnectCab	Connected cabinet? 1=Yes

8.3 Estimation

The empirical model to be estimated in this chapter can be expressed as follows:

$$\begin{aligned}
 F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 COAL_{i,t} \\
 & + \beta_4 ELECT_{i,t} * COAL_{i,t} + \gamma' \mathbf{X}_{i,t} + \eta_i + \nu_{i,t}
 \end{aligned} \tag{8.2}$$

, where countries $i = 1, 2, \dots, N$ and years $t = 1, \dots, T$. As in previous chapters, $F_{i,t}$ represents the budget balance, and since the model is dynamic, it also includes the lagged budget balance, $F_{i,t-1}$. The dummy variable $ELECT$ captures whether elections

were held in year t , where the analysis will focus on different types of elections (such as presidential or parliamentary, coalition and majority coalition elections) as explained above. *COAL* represents the main variables of interest: the single-party dummy, the size of the largest party, the lead of the largest party, and the Banzhaf index. Since the hypotheses are concerned with the effect of these measures in election years, the variable will be interacted with the election dummy. Control variables enter the specification as $\gamma' \mathbf{X}_{i,t}$. A country specific error term is represented by η_i , whilst $\nu_{i,t}$ captures the overall error. The β 's are the parameters to be estimated.

The statistical estimation of this model is not straightforward. The main challenge is that most of the included variables are institutional and thus entirely or partly time-invariant. In this case the fixed effects (FE) model is inefficient because mean-differencing wipes out all or a large amount of variation in the institutional variables.²⁴ Plümper and Tröger point out that “inefficient estimation is not merely a nuisance leading to somewhat higher [standard errors]. Inefficiency leads to highly unreliable point estimates and may thus cause wrong inferences in the same way a biased estimator could.”²⁵ Several options are available to circumvent this problem.

One potential solution is to estimate a pooled model, not accounting for the unit effects. If unit effects are present, as they tend to be in country panels, the pooled statistical model is not correctly specified. If the regressors are correlated with the unit effects the coefficient estimates are biased and inconsistent. Plümper and Tröger argue that the pooled model can be used as a ‘second best’ method when superior alternatives are not available.²⁶ There are a few potential contenders for a ‘first best’ method.

An alternative to the FE model, also employed in the literature, is the random effects (RE) model. Whilst the FE model assigns an individual intercept to each unit, the RE model treats the individual effects as a random draw that is uncorrelated with the regressors and the overall disturbance term. It is possible to estimate institutional variables in an RE model. Yet, the RE model is inappropriate for the analysis for two reasons. First, treating countries as a random draw from a much larger population is not a convincing procedure, unless it is assumed that countries in fact constitute a random sample drawn from a larger, hypothetical population of countries. Second, the assumption of zero correlation between the

²⁴Beck, Nathaniel (2001) Time-Series-Cross-Section Data: What Have We learned in the Past Few Years? *Annual Review of Political Science*, Vol. 4; Baltagi, Badi H. (2001) *Econometric Analysis of Panel Data*, Chichester: Wiley and Sons; Wooldridge, Jeffrey M. (2002) *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.

²⁵Plümper, Thomas and Tröger, Vera E. (2007) Efficient Estimation of Rarely Changing Variables in Panel Data With Unit Fixed Effects, *Political Analysis*, Vol. 15, No. 2, p. 126.

²⁶Plümper and Tröger (2007) (as in n. 25), p. 128.

regressors and the overall error is unlikely to hold. Indeed, a Hausman tests rejects the RE model in favour of the FE model. Hausman and Taylor propose a remedy to the correlation between the regressors and the error term by instrumenting the endogenous time-invariant variables with time-varying variables.²⁷ This procedure has two important shortcomings. Firstly, it does not remedy the inappropriate treatment of countries as a random sample of a much larger population. Secondly, finding good instruments for institutions is a formidable task.²⁸

A fourth alternative is the system-GMM estimator that was employed in previous chapters.²⁹ This estimator was initially designed for circumventing the bias of lagged dependent variables in panel models, as pointed out by Nickell.³⁰ System-GMM principally allows for the inclusion of time-invariant variables because it combines the estimation of differenced variables with variables in levels. However, it was not designed for this variable type. Indeed, estimating equation 8.2 with system-GMM results in an estimate for the coefficient of the lagged dependent variable that is even below the FE estimate. This indicates that the model is incorrectly specified.³¹ System-GMM is therefore not a viable option.

Plümper and Tröger propose a fourth alternative, which constitutes the most appropriate estimation method for equation 8.2.³² Their so-called fixed-effects vector decomposition (FEVD) breaks down the estimation into three steps. In the first stage, estimates of the unit effects are obtained from running an FE model; in the second stage, the unit effects are divided into a part explained by the time-invariant variables and an error term; in the third stage, the model is estimated with pooled OLS including the time-invariant variables and the error term from the second stage. The error term from the second stage is an estimate of the unit effects, the model in the third stage is thus essentially a pooled model with estimated unit effects. Since these effects are purged from the overall error term, the FEVD estimates will be consistent. The authors present Monte Carlo evidence that the FEVD

²⁷Hausman, Jerry A. and Taylor, William E. (1982) Panel Data and Unobservable Individual Effects, *Econometrica*, Vol. 49, No. 6.

²⁸Indeed, there are few studies that successfully instrument institutions with time-varying variables. For a rare positive example see Acemoglu, Daron, Johnson, Simon and Robinson, James A. (2001) The Colonial Origins of Comparative Development: An Empirical Investigation, *The American Economic Review*, Vol. 91, No. 5.

²⁹Arellano, Manuel and Bond, Stephen (1991) Some Tests of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, Vol. 58, No. 2; Arellano, Manuel and Bover, Olympia (1995) Another Look at the Instrumental Variables and GMM: Estimation and Testing, *Stata Journal*, Vol. 3, No. 1; Blundell, Richard and Bond, Stephen (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 87, No. 1.

³⁰Nickell, Stephen J. (1981) Biases in Dynamic Models with Fixed Effects, *Econometrica: Journal of the Econometric Society*, Vol. 49, No. 6.

³¹Bond, Stephen R. (2002) Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice, *Portuguese Economic Journal*, Vol. 1, No. 2.

³²Plümper and Tröger (2007) (as in n. 25).

estimator is a superior alternative, a ‘first best’ method, when estimating time-invariant or rarely-changing variables. The estimator performs particularly well when the between variance is significantly larger than the within variance. In the analysis below, the between variance is consistently twice the size of the within variance, making this a particularly suited estimator. It is thus the optimal method for the estimation of equation 8.2, treating all institutional variables as time-invariant.³³

Having addressed the consistency of the estimator in the case of institutional variables, the model of a lagged dependent variable in a panel setting remains. However, this bias is likely to be relatively small given the length of the time series. To foster confidence in the statistical inference, equation 8.2 will also be estimated without the lagged dependent variable, removing autocorrelation through the Prais-Winsten (PW) transformation.³⁴ The PW transformation essentially entails the differencing of the statistical model, premultiplying all lagged values with an estimate of an AR1 disturbance. The higher the autoregressive parameter, the more the PW estimates resemble the model in pure differences. In the analysis below, the magnitude of this parameter varies between 0.6 and 0.8. Thus, it should be noted that the PW estimates discard long-run effects of the independent variables to a significantly larger extent than the model in equation 8.2 which includes the dependent variable.

Both approaches, estimating the model with a lagged dependent variable or the PW transformation is recommended in conjunction with the FEVD procedure.³⁵ In addition, Plümper and Tröger recommend the use of panel-corrected standard errors (PCSE’s) to account for heteroskedasticity and contemporaneous correlation, as developed by Beck and Katz.³⁶ PCSE’s will thus be reported for all parameter estimates below.³⁷

³³Some institutional variables have a higher degrees of within-variance as others. Treating rarely-changing variables as invariant or not represents a trade-off between bias and efficiency respectively. The specified treatment in the analysis thus treats bias in favour of efficiency. This procedure is endorsed by Plümper and Tröger, who recommend treating variables such as the number of veto players or the size of minimum winning coalitions as rarely-changing; the nature of these variables closely resembles that of the variables included in the analysis below. See Plümper and Tröger (2007) (as in n. 25), pp. 127-128.

³⁴Prais, Sigbert P. and Winsten, Christopher B. (1954) Trend Estimation and Serial Correlation, *Cowles Commission Discussion Paper 383*. For a precursor see Cochrane, Donald and Orcutt, Guy H. (1949) Application of Least Squares Regression to Relationships Containing Auto-Correlated Error Terms, *Journal of the American Statistical Association*, Vol. 44.

³⁵Plümper and Tröger (2007) (as in n. 25), p. 130.

³⁶Beck, Nathaniel and Katz, Jonathan N. (1995) What to Do (And Not to Do) with Time-Series Cross-Section Data, *The American Political Science Review*, Vol. 89, No. 3.

³⁷It should be noted that for FEVD estimates with PCSE it is required that some periods are common to all countries. For this reason a few countries, mostly with unusually short time series, will have to be excluded from estimation. The analysis will always include the maximum number of countries in the analysis which is another reason to why the main sample and restrictions thereof will not always overlap (see country table in the appendix).

8.4 Results

The empirical results will be presented as follows. First, the results for the main analysis will be presented and discussed, followed by the subsidiary analysis. All tables report the FEVD results for both the model with the lagged dependent variable (LDV) and the Prais-Winsten transformation (PW).³⁸ Results for a simple pooled regression with a lagged dependent variable will be reported in some instances to provide an idea of the magnitude of the Nickell bias and because it is a potential alternative to FEVD, being a ‘second best’ method of estimation, given the structure of the data.

8.4.1 Main Analysis

Table 8.2 presents the results for hypothesis 1: political budget cycles are more pronounced under single-party than coalition government. Columns one through three present the results for the ‘empty’ model, which includes all individual variables but not the interaction between the election and the single party dummies. Comparing the coefficient of the lagged dependent variable in columns one, for the pooled model, and column two, for the FEVD model, indicates that the Nickell-bias is still considerable with roughly 0.2 points difference in the coefficients. This reinforces the decision to also include the PW estimates in the tables.

Eye-balling the behaviour of all individual variables included in table 8.2 generally confirms expectations. The election dummy is signed as expected: in election years the budget balance decreases, in other words, the government runs a higher deficit. The single-party dummy variable is positive, indicating that single party governments run lower budget deficits than coalition governments. This finding is consistent with the literature that argues that coalition partners find it more difficult to internalise the cost of government spending, resulting in higher deficits.³⁹ The coefficient is unstable, however, even though it reaches statistical significance in some specifications in table 8.2 (e.g. columns 6 and 8).

Similarly, in vein with the same literature, the fractionalisation variable is positive, since higher fractionalisation increases the competition for the support of smaller groups resulting in higher spending, however, the coefficient is also rather unstable. The coefficient for the

³⁸For the PW results, the table also include Durbin-Watson statistics for the untransformed and transformed model.

³⁹Bawn, Kathleen and Rosenbluth, Frances (2006) Short Versus Long Coalitions: Electoral Accountability and the Size of the Public Sector, *American Journal of Political Science*, Vol. 50, No. 2; Persson, Torsten, Roland, Gérard and Tabellini, Guido E. (2007) Electoral Rules and Government Spending in Parliamentary Democracies, *Quarterly Journal of Political Science*, Vol. 2, No. 2.

Table 8.2: Single party government

Dep. variable	Budget balance									
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Method	Pooled (LDV)	FEVD (LDV)	FDVD (PW)	Pooled (LDV)	FEVD (LDV)	FDVD (PW)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)
Sample	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
Election	All	All	All	All	All	All	Parl	Parl	Pres	Pres
Balance (L1)	0.74*** (0.04)	0.54*** (0.06)		0.75*** (0.04)	0.55*** (0.06)		0.55*** (0.06)		0.54*** (0.06)	
Output gap	0.03 (0.05)	0.21*** (0.04)	0.52*** (0.03)	0.03 (0.05)	0.23*** (0.04)	0.53*** (0.03)	0.22*** (0.03)	0.52*** (0.03)	0.23*** (0.04)	0.53*** (0.03)
LnGDP	0.35*** (0.07)	1.01*** (0.34)	0.82** (0.31)	0.33*** (0.07)	0.97*** (0.33)	0.81** (0.32)	0.95*** (0.33)	0.84** (0.33)	0.96*** (0.33)	0.84** (0.30)
Unified	0.18 (0.15)	0.37*** (0.11)	-0.35* (0.21)	0.09 (0.14)	0.27** (0.12)	-0.38* (0.22)	0.28** (0.12)	-0.35 (0.21)	0.28** (0.12)	-0.33 (0.23)
Fraction	0.67 (0.46)	0.56 (0.34)	0.70** (0.35)	0.65 (0.46)	0.59* (0.34)	0.90** (0.38)	0.43 (0.35)	0.68* (0.35)	0.34 (0.36)	0.55 (0.37)
PR	-0.02 (0.13)	-0.23*** (0.08)	0.04 (0.04)	-0.06 (0.14)	-0.25*** (0.08)	0.05 (0.04)	-0.25*** (0.09)	0.03 (0.04)	-0.25*** (0.08)	0.03 (0.04)
Presidential	0.49*** (0.17)	1.11*** (0.25)	1.35*** (0.32)	0.53*** (0.17)	1.11*** (0.23)	1.32*** (0.33)	0.91*** (0.23)	1.10*** (0.33)	1.24*** (0.23)	1.46*** (0.34)
Single Party	0.16 (0.15)	0.14 (0.21)	0.48 (0.30)	0.24 (0.17)	0.30 (0.20)	0.78** (0.31)	0.27 (0.19)	0.78** (0.31)	0.10 (0.22)	0.42 (0.30)
Elect	-0.58*** (0.15)	-0.55*** (0.15)	-0.48** (0.20)	-0.37** (0.17)	-0.33* (0.18)	-0.21 (0.23)	-0.43* (0.23)	-0.21 (0.31)	-0.41 (0.27)	-0.61 (0.38)
Elect x Single Party				-0.54* (0.33)	-0.79*** (0.28)	-1.06*** (0.34)	-1.02*** (0.39)	-1.71*** (0.50)	-0.08 (0.36)	0.52 (0.49)
Adj. R2	0.64	0.68	0.50	0.64	0.68	0.50	0.68	0.50	0.68	0.50
No. countries	61	61	61	61	61	61	61	61	61	61
No. obs	1258	1258	1203	1258	1258	1203	1258	1203	1258	1203
Pre-DW			0.76			0.75		0.76		0.76
Post-DW			1.93			1.93		1.93		1.93
Joint effect				-0.91*** (0.29)	-1.12*** (0.23)	-1.26*** (0.30)	-1.45*** (0.32)	-1.92*** (0.43)	-0.48*** (0.17)	-0.11 (0.27)

*** p<0.01, ** p<0.05, * p<0.1

LDV: Lagged Dependent Variable; PW: Prais-Winsten transformation

Pooled model: Robust standard errors in parantheses; FEVD model: Panel-corrected standard errors in parentheses

Pre-DW: original Durbin-Watson statistic; Post-DW Prais-Winsten transformed Durbin Watson statistic

unified variable that controls for whether a government controls the legislature is also rather unstable: across all reported specifications, it is positive in the LDV and negative in the PW case. This may be due to short-run versus long-run effects, as discussed above. The economic controls, the output gap and log GDP per capita perform as expected and are in line with Barro's depiction of countercyclical fiscal policy.⁴⁰ Lastly, the controls for PR and Presidentialism are also signed as expected, i.e. positively, conforming with the findings of Persson and Tabellini.⁴¹

Columns four through six include the interaction term between the election and single-party dummies. It is statistically significant at the 10% level in the pooled model and at the 1% in the FEVD specifications. This drastic increase in significance is not surprising given that the FEVD procedure produces more efficient results than a pooled regression. Turning to the joint effects at the bottom of table 8.2 shows that the effect of single parties on political budget cycles is considerable: under single party government, the budget balance decreases by roughly 1% of GDP. This is about threefold the size of an election deficit of a typical coalition government, and about twice the estimate across all types of government in columns one through three.⁴²

The remaining four columns present the results for parliamentary and presidential elections respectively. They indicate that the effect is mainly driven by parliamentary democracies. Columns seven and eight show that the effect is about 50% larger than in columns four through six that include elections of both regime types. The effect is statistically indistinguishable from zero for presidential democracies. One possible explanation is that the presented theory is a worse fit for presidential elections. Alternatively, it may be a statistical artefact because there are less than half as many presidential as parliamentary elections in the sample. Lastly, the effect may be weak because presidential government is often characterised by divided government. Table three examines the effect of elections on the budget balance when the government controls the legislature (i.e. when the unified variable equals one).

In the sample, there are 116 elections in which the variable is coded as one. The interaction effect of the election and unified dummy in columns one and two of table three is significant at the 1% level and of considerable magnitude, comparable to that of the single-party dummy. This is not surprising because there is considerable overlap between the two

⁴⁰Barro, Robert J. (1979) On the Determination of the Public Debt, *The Journal of Political Economy*, Vol. 87, No. 5.

⁴¹Persson and Tabellini (2003) (as in n. 15); Persson and Tabellini (2004a) *The American Economic Review* (as in n. 15).

⁴²The PW results are consistently the most pronounced, suggesting that these are largely short-term effects.

Table 8.3: Unified and single party

Dep. variable	Budget balance			
Model	(1)	(2)	(3)	(4)
Method	FEVD (LDV)	FEVD (PW)	FDVD (LDV)	FEVD (PW)
Sample	Full	Full	Full	Full
Election	All	All	Single Party	Single Party
Balance (L1)	0.55*** (0.06)		0.54*** (0.06)	
Output gap	0.22*** (0.04)	0.52*** (0.03)	0.22*** (0.04)	0.53*** (0.03)
LnGDP	0.97*** (0.33)	0.83** (0.33)	0.96*** (0.33)	0.84*** (0.31)
Fraction	0.46 (0.33)	0.65* (0.35)	0.45 (0.34)	0.56 (0.40)
PR	-0.25*** (0.07)	0.06 (0.05)	-0.22*** (0.07)	0.09* (0.05)
Presidential	1.12*** (0.23)	1.33*** (0.33)	1.12*** (0.23)	1.32*** (0.34)
Single	0.11 (0.20)	0.48* (0.29)	0.21 (0.20)	0.63** (0.29)
Unified	0.53*** (0.14)	-0.05 (0.23)	0.51*** (0.13)	-0.11 (0.24)
Elect	-0.21 (0.19)	-0.15 (0.25)		
Elect (Unified=1)			-0.44 (0.33)	-0.27 (0.46)
Elect x Unified	-1.08*** (0.26)	-1.15*** (0.38)		
Elect (Unified=1) x Single Party			-1.04*** (0.37)	-1.32** (0.52)
Adj. R2	0.68	0.51	0.68	0.51
No. countries	61	61	61	61
No. obs	1258	1203	1258	1203
Pre-DW		0.75		0.75
Post-DW		1.93		1.93
Joint effect	-1.29*** (0.20)	-1.30*** (0.31)	-1.48*** (0.22)	-1.60*** (0.38)

*** p<0.01, ** p<0.05, * p<0.1

LDV: Lagged Dependent Variable; PW: Prais-Winsten transformation

Panel-corrected standard errors in parentheses

Pre-DW: original Durbin-Watson statistic; Post-DW Prais-Winsten transformed Durbin Watson statistic

variables. Columns three and four interact the single-party dummy with an election dummy that is only coded as one when the unified variable equals one. It considerably amplifies the joint effect of the two variables, making it comparable to the joint effect in parliamentary elections. Limiting the election dummy further by excluding parliamentary elections removes too much variation for meaningful statistical inference. However, it seems reasonable to infer that deficits are higher in election years in both parliamentary and presidential regimes if the executive and the legislative are aligned.

Taken together, the results from tables 8.2 and 8.3 provide strong support for hypothesis 8.1. Political budget cycles are considerably more pronounced when governments have more autonomy, i.e. when they are made up by only one party and when they do not face veto players in the legislature.

Tables 8.4 and 8.5 present the empirical tests for hypothesis 8.2: Coalitions with a larger party in government have higher deficits. Table 8.4 presents the regression estimates; since the main variable in this analysis, the size of the largest party, is interval rather than a dummy measure, joint effects will be calculated for the first, second, and third quartile of the conditioning variable in table 8.5. Columns one through seven of table 8.4 focus on the vote share of the largest party in government. The interaction effect with the election dummy is significant at the 5% level or stronger in the pooled model and the two FEVD specifications. Table 8.5 shows that the effect of election years is negative and significant for all three quartiles, increasing in absolute magnitude as the vote share increases. This provides empirical support for hypothesis 8.2.

However, the sample includes countries with single-party and coalition governments. The effect may thus be driven by the single-party governments. The remaining columns of table 8.4, columns four through nine exclude all countries that consistently have single-party governments (which means that countries are still included if they had both single-party and coalition-government).⁴³ The election dummy, only includes elections under coalition government. The interaction term is signed in accordance with expectations, however, it is rather unstable. In columns eight and nine, election years are only coded as one when they were contested by a coalition government that commanded a majority of the seats in the legislature. For these elections, the effect is negative and significant at the 5% level in both specifications. Turning to the marginal effects in table 8.5, the negative effect

⁴³The United States, for example, is excluded from this sample because the government is either formed by the Democrats or the Republicans and the two parties were never aligned.

of election years on the budget balance is statistically significant for at least half of the observations. Across specifications, magnitude of the political budget cycle at the third quartile, is approximately -1% of GDP which is only slightly weaker than the estimate of the joint effect of elections under single party government in table 8.3. Overall, the results provide strong support for hypothesis 8.2.

Lastly, table 8.4 reports estimates for the alternative operationalisation of the size of the largest part: its lead over the second largest coalition party. Results will only be reported for a specification that corresponds to the final specification of the vote share variable in columns six and seven; the election dummy thus only includes elections contested by majority coalition governments. As expected, the coefficient of the interaction between the election dummy and the distance variable is negative, meaning that a bigger lead of the largest over the second largest coalition party results in a higher deficit. The effect is significant at the 1% level in the LDV specification and at the 10% level in the PW specification. However, table 8.5 indicates that the joint effect is only statistically significant for the third quartile of the conditioning variable. This may partly be due to the decreased sample size due to the restricted length of time series available for this variable (the number of countries decreases to 29). Alternatively, the lead may be required to be rather substantial to incentivise large parties to feign competence.

Jointly, the results from tables 8.4 and 8.5 support hypothesis 8.2. To illustrate the effect graphically, figures 8.1 and 8.2 plot the marginal effect of election years on the budget balance, conditioned on different values of the largest party's vote share (figure one) and the lead of the largest party (figure 8.2).⁴⁴ The solid line, indicating the marginal effect, is relatively steep, indicating the considerable joint effect of the variables. The dotted lines represent 95% confidence intervals; they demonstrate that the effect is significant over a considerable range of values of the conditioning variables (including more than 50% of the possible values of both operationalisations of the largest party size).

⁴⁴The figures are based on Brambor, Thomas, Clark, William R. and Golder, Matt (2006) Understanding Interaction Models: Improving Empirical Analyses, *Political Analysis*, Vol. 14, No. 1.

Table 8.4: Size of the largest party / Distance

Dep. variable	Budget balance								
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Method	Pooled (LDV)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)
Sample	Full	Full	Full	Coal.	Coal.	Coal.	Coal.	Coal.	Coal.
Election	All	All	All	Coal.	Coal.	Coal. (major)	Coal. (major)	Coal. (major)	Coal. (major)
Balance (L1)	0.74*** (0.04)	0.51*** (0.06)		0.60*** (0.03)		0.60*** (0.03)		0.62*** (0.03)	
Output gap	0.08 (0.06)	0.27*** (0.04)	0.59*** (0.03)	0.33*** (0.05)	0.67*** (0.06)	0.33*** (0.05)	0.66*** (0.06)	0.27*** (0.03)	0.64*** (0.07)
LnGDP	0.35*** (0.08)	0.89*** (0.42)	1.48*** (0.46)	0.64*** (0.08)	1.55*** (0.21)	0.63*** (0.08)	1.56*** (0.21)	0.89*** (0.09)	1.60*** (0.37)
Unified	0.06 (0.16)	0.25*** (0.09)	0.78 (0.15)	-0.37* (0.20)	-1.31*** (0.22)	-0.34* (0.19)	-2.21*** (0.22)	0.16 (0.13)	-0.80** (0.39)
Fraction	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.75 (0.80)	1.71** (0.77)	1.01 (0.85)	2.11*** (0.78)	0.00 (0.00)	0.00 (0.00)
PR	-0.10 (0.14)	-0.20** (0.08)	-0.49*** (0.18)	-0.86*** (0.12)	-2.29*** (0.24)	-0.86*** (0.14)	-2.32 (0.24)	-1.47*** (0.20)	-3.59*** (0.53)
Presidential	0.39** (0.18)	0.76*** (0.23)	1.26*** (0.31)	0.01 (0.08)	-0.02 (0.19)	0.03 (0.08)	0.03 (0.19)	-0.01 (0.26)	-0.08 (0.54)
Elect	0.35 (0.38)	0.37 (0.35)	0.57 (0.48)	0.07 (0.44)	0.57 (0.64)	0.68 (0.49)	0.72 (0.60)	0.18 (0.21)	0.15 (0.54)
Largest Party	0.01* (0.00)	0.02*** (0.01)	0.02*** (0.01)	0.02** (0.01)	0.05*** (0.01)	0.03** (0.01)	0.05*** (0.01)		
Elect x Largest Party	-0.03** (0.01)	-0.03*** (0.01)	-0.04*** (0.01)	-0.02 (0.01)	-0.04* (0.02)	-0.03** (0.01)	-0.03** (0.02)		
Distance (1-2)								0.00 (0.00)	0.00 (0.01)
Elect x Distance(1-2)								-0.03*** (0.01)	-0.04* (0.03)
Adj. R2	0.65	0.69	0.56	0.74	0.55	0.75	0.55	0.74	0.52
No. countries	56	56	56	35	35	35	35	29	29
No. obs	1083	1083	1037	672	643	672	643	585	564
Pre-DW			0.81		0.69		0.69		0.69
Post-DW			1.93		1.89		1.89		1.89

*** p<0.01, ** p<0.05, * p<0.1

LDV: Lagged Dependent Variable; PW: Prais-Winsten transformation

Pooled model: Robust standard errors in parentheses; FEVD model: Panel-corrected standard errors in parentheses

Pre-DW: original Durbin-Watson statistic; Post-DW Prais-Winsten transformed Durbin Watson statistic

Table 8.5: Marginal effects

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Method	Pooled (LDV)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)	FEVD (LDV)	FEVD (PW)
Sample	Full	Full	Full	Coal.	Coal.	Coal.	Coal.	Coal.	Coal.
Election	All	All	All	Coal.	Coal.	Coal. (major)	Coal. (major)	Coal. (major)	Coal. (major)
Elect x Largest Party	p(75)	-0.86*** (0.21)	-0.99*** (0.17)	-1.14*** (0.25)	-0.60*** (0.15)	-0.96*** (0.30)	-0.71*** (0.24)	-1.05*** (0.26)	
	p(50)	-0.64*** (0.17)	-0.75*** (0.16)	-0.83*** (0.23)	-0.48*** (0.12)	-0.67*** (0.21)	-0.45*** (0.18)	-0.71*** (0.21)	
	p(25)	-0.48*** (0.16)	-0.57*** (0.17)	-0.60*** (0.24)	-0.33*** (0.16)	-0.35 (0.23)	-0.16 (0.17)	-0.35 (0.25)	
Elect x Distance (1-2)	p(75)							-0.48*** (0.17)	-0.65*** (0.37)
	p(50)							-0.13 (0.15)	-0.23 (0.31)
	p(25)							0.11 (0.20)	0.07 (0.48)

*** p<0.01, ** p<0.05, * p<0.1

LDV: Lagged Dependent Variable; PW: Prais-Winsten transformation

Pooled model: Robust standard errors in parentheses; FEVD model: Panel-corrected standard errors in parentheses

Pre-DW: original Durbin-Watson statistic; Post-DW Prais-Winsten transformed Durbin Watson statistic

Figure 8.1: Marginal effect of largest party (model 6, table 4)

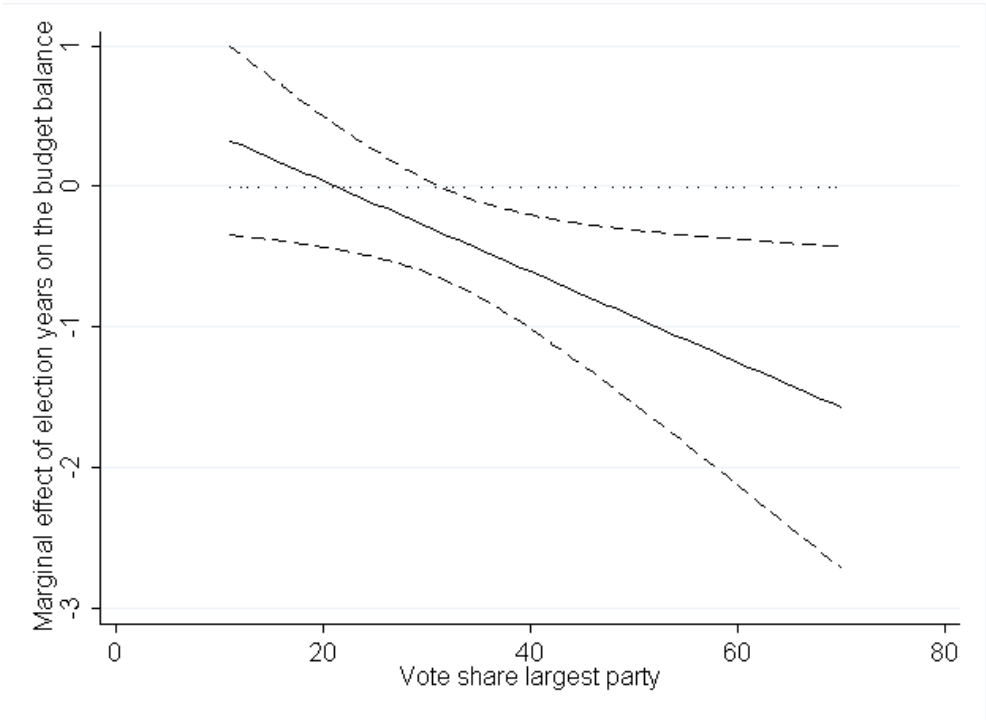
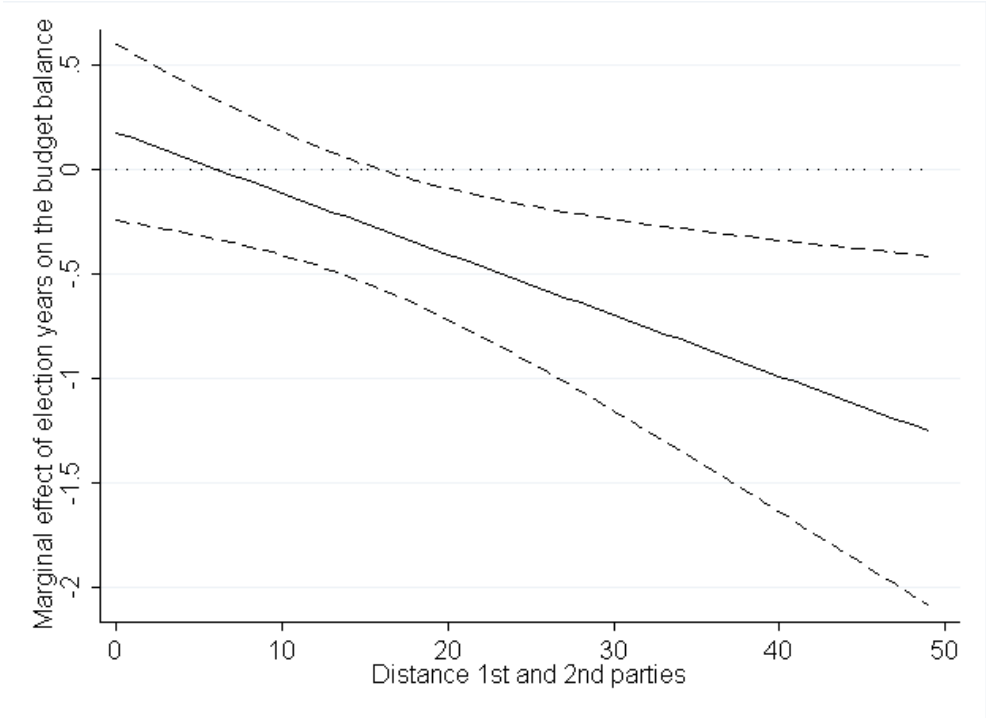


Figure 8.2: Marginal effect of distance (1-2) (model 8, table 4)



8.4.2 Subsidiary Analysis

The subsidiary analysis turns to the Banzhaf index as the main conditioning variable. The composition of the sample differs from the main analysis in particular because it only has 17 democracies, all of them parliamentary (or semi-presidential) and developed. Although there are fewer countries in the sample, the time series are longer, stretching from the early 1960s until the 1990s. Table 8.6 reports the results for the analysis.

The coefficient of the interaction between the Banzhaf index and the election dummy is signed as expected in the pooled and the two FEVD specifications in columns one through three. However, the coefficient is statistically unstable. In fact, it only reaches conventional levels of statistical significance at the 10% level, in the FEVD specification including the lagged dependent variable in column two. Although the results are generally in line with hypothesis 8.2, the weak statistical significance weakens the confidence in the results.

Turning to the marginal effects at the bottom of table six shows that they are also correctly signed - however, only one of the estimates is statistically significant (at the 10% level in column two). This is not altogether surprising. The sample only includes developed countries where the literature has established that political budget cycles are relatively small.⁴⁵ When the magnitude of electioneering is small, it is more difficult to detect statistically significant variation across levels of the conditioning variable. However, although table 8.6 only lends weak support to hypothesis two, it does not generally reject it.

8.4.3 Robustness Checks

The robustness of the results was checked in several ways. First, the main analysis was re-run on different data. The budget balance and economic indicators from the Brender and Drazen set were replaced with data from the IMF's *2009 Economic Outlook*; the institutional variables from the DPI were retained and Brender and Drazen's election dummy was replaced with an election indicator from the DPI. The result is a dataset that extends from 1980 to 2006. The overall number of countries and observations, however, is significantly smaller than in the analysis above. The results generally uphold for all specifications except for the distance of the largest party which turns insignificant. This lends further support to hypotheses 8.1 and 8.2.

The size of the largest party is operationalised as the absolute vote share, rather than the

⁴⁵Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 5); Shi and Svensson (2006) *Journal of Public Economics* (as in n. 4).

Table 8.6: Banzhaf index

Dep. variable	Budget balance			
Model		(1)	(2)	(3)
Method		Pooled (LDV)	FEVD (LDV)	FEVD (PW)
Election: Majority coalition elections				
Balance (L1)		0.89*** (0.02)	0.78*** (0.05)	
Output gap		0.59*** (0.14)	0.52*** (0.12)	1.53*** (0.16)
LnGDP		0.59*** (0.14)	0.47* (0.25)	0.93 (0.41)*
Fragment		-0.02 (0.10)	-0.05 (0.24)	-0.72*** (0.14)
PR		-0.15 (0.26)	-0.04 (0.09)	0.48 (0.41)
Semi-Pres.		-0.08 (0.26)	0.08 (0.23)	0.35 (0.45)
Chambers		-0.15 (0.19)	-0.13 (0.17)	-0.74*** (0.22)
PolicyAgree		0.25 (0.21)	0.64*** (0.22)	2.10*** (0.35)
ConnectCab		0.47** (0.20)	0.67*** (0.18)	1.82*** (0.24)
Elect		0.61 (0.73)	0.68 (0.57)	0.37 (0.96)
Bhanzaf		0.09 (0.65)	-0.29 (0.61)	-4.48*** (0.86)
Elect x Banzhaf		-2.09 (1.89)	-2.26* (1.39)	-1.52 (2.39)
Adj. R2		0.85	0.85	0.58
No. countries		17	17	17
No. obs		519	519	505
Pre-DW				0.42
Post-DW				1.72
Joint effect				
Elect x Banzhaf	p(75)	-0.86 (0.67)	-0.90* (0.51)	-0.70 (0.86)
	p(50)	-0.44 (0.33)	-0.45 (0.29)	-0.39 (0.47)
	p(25)	-0.09 (0.22)	-0.07 (0.24)	-0.14 (0.37)

*** p<0.01, ** p<0.05, * p<0.1

LDV: Lagged Dependent Variable; PW: Prais-Winsten transformation

Pooled model: Robust standard errors in parantheses; FEVD model: Panel-corrected standard errors in parentheses

relative vote share as a fraction of overall votes for the government. It was argued above that this was motivated by considerations of opposition influence over policy. Using a measure of the *relative* vote share, however, does not significantly alter the results. Somewhat relatedly, the conditional effect of the size of the largest party on the budget balance may be an artefact of the *number* of parties in government.⁴⁶ The larger a party it is, the less coalition partners may be required to form a majority. More parties in the coalition implies more potential veto-points, so the size of the largest party may just be a proxy of the number of coalition members. For this reason, this number was statistically controlled for. The results are robust to this specification. Secondly, the number of coalition members was also interacted with the election dummy. Although the joint effect is negative, as expected, it is far from statistically significant.⁴⁷ This increases confidence that the effect is indeed driven by the size of the largest party.

The subsidiary analysis has shown that results are less pronounced when countries are developed democracies. For this reason, the analysis was re-run separately for ‘new’ and ‘old’ democracies, as specified by Brender and Drazen. Indeed, the effect is significantly stronger in ‘new’ democracies which is in line with the discussion of the subsidiary analysis: political budget cycles are more pronounced in ‘new’ democracies and differences in the magnitude depending on conditioning factors are thus easier to detect statistically.

Lastly, there could be an argument that looking at the largest party is not appropriate - rather, one should look at the size of key players, such as the party of the Prime Minister (PM) or Finance Minister (FM).⁴⁸ The CPDA contains data on the electoral performance on the PM’s and FM’s parties. The results are inconclusive at best. This may, however, be due to the fact that the variable is constructed as the change in performance compared to the last election - hypothesis 8.2 emphasises absolute size rather than changes, however, which may explain the poor results. To the extent that large parties are also more powerful parties, concentrating on the size of the largest party in government still seems appropriate. For further robustness checks, see chapter 9 - the key result about the size of the largest party upholds, lending strong support to hypothesis 8.2.

⁴⁶ As explained in chapter 7, Chang argues that the number of coalition parties decreases the magnitude of political budget cycles, see Chang, Eric C.C. (2008) Electoral Incentives and Budgetary Spending: Rethinking the Role of Political Institutions, *The Journal of Politics*, Vol. 70, No. 4.

⁴⁷ Note that this result casts doubt on Chang’s findings since the sample for the analysis in this chapter is considerably larger than Chang’s sample of OECD members, see Chang (2008) (as in n. 46).

⁴⁸ Duch and Stevenson (2008) (as in n. 17); Hallerberg, Mark, Strauch, Rolf R. and Hagen, Jürgen von (2009) *Fiscal Governance in Europe*, Cambridge: Cambridge University Press.

8.5 Conclusion

What is the effect of coalition government on political budget cycles? Jointly with the previous chapter, chapter 7 that developed the theory informing this chapter, it was demonstrated that coalition governments experience lower political budget cycles than single-party government. Moreover, the magnitude of political budget cycles increases in the size of the largest party in government. These results derive support from a large sample of democracies from both developed and developing countries. They are particularly strong in parliamentary democracies, however, in cases where government is not divided, the effects hold across regimes more generally. The results are also stronger in ‘new’ democracies than established ones.

Three different measures were employed to measure the strength of the largest party. Employing a measure based on vote share (both with respect to absolute vote share of the largest party and the lead of the largest over the second largest party), the empirical results provide strong support for the theory. Employing a measure based on the Banzhaf index, which captures a party’s bargaining strength based on the number of coalitions it is pivotal to, only lends weak support to the theory. This may, however, be the result of the countries included in the analysis, which are all developed democracies where political budget cycles are known to be relatively small. On the whole, the theoretical argument is thus largely corroborated.

The study of policy formulation under coalition government is complex and only few studies have so far explored political budget cycles under multi-party government. Chapters 7 and 8 of this thesis are arguably, to this point, the most extensive study on this subject, combining both theoretical modeling and empirical analyses based on a large cross-section of countries. The results are interesting in particular when contrasted with the literature on the size of government under alternative types of government. This literature has established that coalition government results in higher government expenditure than single-party government, which is in particular due to the common pool problem. However, when it comes to strategic borrowing the opposite is the case, where single-party governments borrow more before elections than coalitions. This effect is moderated by the relative size of the most powerful coalition party, where political budget cycles become more pronounced the stronger the largest governing party is.

8.6 Appendix

Table A.8.1: Descriptive statistics: Main analysis (tables 1-3, full sample)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	1258	-2.62	-2.34	3.88	-19.17	12.67
Single Party	1258	0.46	0	0.50	0	1
Largest Party	1258	40.90	38.84	16.40	11.87	66.36
Distance(1-2)	1258	8.22	0	12.33	0	47.58
Elect	1258	0.21	0	0.41	0	1
Elect (Parl.)	1258	0.16	0	0.37	0	1
Elect (Pres.)	1258	0.08	0	0.26	0	1
Elect (Unif.)	1258	0.09	0	0.29	0	1
Elect (Coal.)	1258	0.11	0	0.31	0	1
Elect (Major)	1258	0.10	0	0.31	0	1
Growth	1258	3.12	2.92	1.88	-3.18	12.33
LnGDP	1258	8.79	8.89	0.94	6.21	10.25
Unified	1258	0.43	0	0.50	0	1
Fraction	1258	0.63	0.66	0.19	0	1
PR	1258	0	0.36	0	0	1
Presidential	1258	0.27	0	0.48	0	1

Table A.8.2: Descriptive statistics: Banzhaf index (table 5)

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Balance	519	-2.55	-2.26	4.28	-15.75	7.59
Bhanzaf	519	0.56	0.50	0.26	0.20	1
Elect	519	0.19	0	0.39	0	1
Output gap	519	3.06	2.75	1.24	0.80	8.66
LnGDP	519	9.20	9.26	0.58	7.89	10.50
Fragment	519	3.02	3.00	1.52	1.00	8.22
PR	519	0.81	1	0.39	0	1
Semi-Pres.	519	0.12	0	0.33	0	1
Chambers	519	0.43	0	0.50	0	1
Policy Agree	519	0.76	1	0.43	0	1
ConnectCab	519	0.76	1	0.43	0	1

Table A.8.3: Countries

Country	Full sample (tables 1-4)	Coalition (tables 1-4)	Banzhaf (table 5)	Country	Full sample (tables 1-4)	Coalition (tables 1-4)	Banzhaf (table 5)
Argentina	1984-2000			Luxembourg	1977-1997	1977-1997	1971-1997
Australia	1976-2000	1976-2000		Madagascar		1994-2000	
Austria	1976-1999	1976-1999	1962-1997	Malaysia	1975-1999	1975-1999	
Belgium	1975-1998	1975-1998	1962-1997	Mali	1980-2000	1980-2000	
Bolivia	1980-2000	1980-2000		Mauritius	1977-2000		
Brazil	1986-1998	1986-1998		Mexico	1981-2000		
Bulgaria	1989-2000			Nepal	1975-2000		
Canada	1975-2000			Netherlands	1975-1996	1975-1996	1962-1997
Chile	1990-2000	1990-2000		New Zealand	1976-2000		
Colombia	1975-2000			Nicaragua	1989-2000		
Costa Rica	1975-1999			Norway	1975-1998	1975-1998	1962-1997
Cyprus	1977-2000	1977-2000		Pakistan	1989-2000	1989-2000	
Denmark	1976-1999	1976-1999	1962-1997	Panama	1975-2000		
Dominican Rep.	1975-2000			Papua New Guinea	1983-1989	1983-1989	
Ecuador	1980-2000			Paraguay	1990-2001		
El Salvador	1975-2000			Peru	1987-2000	1987-2000	
Estonia	1993-2000			Philippines	1988-1989	1988-1989	
Fiji	1975-1999			Poland	1992-2000	1992-2000	
Finland	1976-1998	1976-1998	1975-1997	Portugal	1977-1998		1977-1997
France	1975-1997	1975-1997	1973-1997	Romania	1981-1999	1981-1999	
Germany	1977-1998	1977-1998	1962-1997	Slovenia		1994-2000	
Greece	1975-1998		1978-1997	South Africa	1975-2000		
Guatemala	1986-2000			Spain	1987-1999		1978-1997
Honduras	1981-2000			Sri Lanka	1975-2000	1975-2000	
Hungary	1982-2000	1982-2000		Sweden	1975-2000	1975-2000	1962-1997
Iceland	1975-2000	1975-2000	1973-1997	Switzerland	1976-2000	1976-2000	
India	1975-2000	1975-2000		Turkey	1984-2000	1984-2000	
Ireland	1975-1998	1975-1998	1962-1997	United Kingdom	1975-1999		1962-1997
Israel	1975-1999	1975-1999		United States	1977-2000		
Italy	1977-1998	1977-1998	1962-1997	Uruguay	1975-2000	1975-2000	
Japan	1980-1994			Venezuela	1975-2000		
South Korea	1975-1997						

Part IV

Summary & Conclusion

Chapter 9

Empirical Reprise

9.1 Introduction

Parts II and III of this thesis have explored different contextual features that affect governments' incentives to increase the deficit in election years. Each chapter has aimed to disentangle these effects and empirical models were tailored to suit each particular contextual factor. Identifying the appropriate statistical procedure always involves trade-offs: between bias and efficiency, sample size and the number of statistical controls, the quality and quantity of instrumental variables, and many more. Such necessary choices made about statistical specification were carefully justified in the estimation sections of each chapter. By way of conclusion, this chapter will now combine the analyses from all chapters in an empirical reprise to examine whether the empirical results uphold when all factors that were shown to play a role in the determination of the magnitude of political budget cycles are included in one statistical model. In this light, this chapter is an empirical wrap-up of this thesis.

The chapter proceeds as follows. The next section will review choices of empirical specification made in this thesis. It will pay particular attention to the use of different models, such as Fixed Effects (FE) and Random Effects (RE) models, bias-corrected Least Square Dummy Variable (LSDVC) regression, Generalised Method of Moments (GMM) estimators, and Fixed Effects Vector Decomposition (FEVD). It will also explain how the thesis has handled issues of reverse causality: endogeneity is a serious and common problem in empirical research designs and it was an issue that this thesis has taken seriously. The next section, section three, will then proceed to the empirical reprise, in other words a re-analysis of all the empirical relationships in combined, comprehensive statistical models. The last section concludes.

9.2 Review: Empirical Specification

This thesis has made use of a number of statistical models. The model choice was determined by the structure of the data and the goal of unbiased, efficient inference. Particular attention was devoted to accounting for uncertainty in the estimates through model choice, simulations, and graphical presentation. Data in all empirical chapters were in panel structure. The exception is chapter 3 where data were drawn from different countries and different periods but time series were not necessarily continuous for all units. Moreover, the data

in chapter 3 were different from all other data sets used in this thesis as they combined variables collected at the individual, respondent, level and the country level. A multi-level model (or, essentially, an RE model) was chosen to estimate the hypothesised effects since, it was argued, such models are most appropriate for this type of data. Arguably the most important reason for this is that this estimation procedure corrects the standard errors by accounting for the two-level structure of the data. This is important to correctly account for uncertainty.

The data in chapters 4, 5, 6, and 8 all were 'proper' time series-cross sectional data with all observations at the country level and with continuous time series. Depending on the nature and availability of data, different statistical problems emerged. In chapters 4 through 6 the key variables were generally continuous and time-varying, in chapter 8 the main variables were institutional with little temporal variation. Where data were continuous the key challenge was to obtain unbiased estimates. The principal source of bias in these models was the so-called Nickell-bias resulting from the correlation between a lagged dependent variable (LDV) and the unit effects.¹ As in all other statistical models of political budget cycles in the literature, the LDV was included to model the dynamics of the data.² Yet with an LDV and unit effects, simple FE estimation is biased. A relatively simple alternative, the RE estimator, was rejected by a Hausman test.

The thesis has presented two better alternatives to remedying the Nickell-bias. One method is based on Arellano and Bond's GMM estimator and one on a relatively straightforward bias correction through the LSDVC estimator.³ Which estimator is the best for the data in each chapter? The thesis has based this choice on Monte-Carlo simulations presented by Judson and Owen who show that the GMM estimator is preferable for relatively short time series with many units and the LSDVC estimator for long time series with few units.⁴

¹Nickell, Stephen J. (1981) Biases in Dynamic Models with Fixed Effects, *Econometrica: Journal of the Econometric Society*, Vol. 49, No. 6.

²See, e.g. Shi, Min and Svensson, Jakob (2003) Political Budget Cycles: A Review of Recent Developments, *Nordic Journal of Political Economy*, Vol. 29, No. 1; Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9; Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7; Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3.

³For GMM, see: Arellano, Manuel and Bond, Stephen (1991) Some Tests of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, Vol. 58, No. 2; Arellano, Manuel and Bover, Olympia (1995) Another Look at the Instrumental Variables and GMM: Estimation and Testing, *Stata Journal*, Vol. 3, No. 1; Blundell, Richard and Bond, Stephen (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, Vol. 87, No. 1. For LSDVC see in particular: Bruno, Giovanni S.F. (2005a) Approximating the Bias of the LSDV Estimator for Dynamic Unbalanced Panel Data Models, *Economics Letters*, Vol. 87, No. 3.

⁴Judson, Ruth A. and Owen, Ann L. (1999) Estimating Dynamic Panel Data Models: A Guide for Macroeconomists, *Economics Letters*, Vol. 65, No. 1.

Accordingly, the LSDVC estimator was chosen for chapter 4 with very few countries but time series of up to 30 years and the GMM estimator for chapters 5 and 6 with more countries but shorter time series.

Whilst in these chapters bias was the main concern, in chapter 8 both bias and efficiency were of concern. Based on the argument of Plümper and Tröger, more attention was given to efficiency by choosing the FEVD estimator.⁵ However, the Nickell-bias was not ignored but circumvented by estimating the model with an LDV as well as with the Prais-Winsten transformation which accounts for the dynamics in a more indirect way (one downside of this, it was argued, is that more long-run effects are largely wiped out by this procedure).

In the empirical analysis that follows the models are estimated with the GMM procedure. GMM has a number of advantages that make this estimator the most competitive among the ones available and discussed above. The LSDVC estimator is a possible alternative with regards to the number of countries, but since time series are relatively short the GMM procedure seems more appropriate. GMM has other advantages that make it particularly attractive. For one, it allows to instrument for other endogenous predictors. Reverse causality, or endogeneity, is an issue in many of the chapters. In chapter 4, it was addressed by finding a lag-structure for the key variable (vote intention) that ensures that the deficit is a consequence of government popularity and not vice versa. With GMM, as used in chapters 5 and 6, variables such as credit ratings or bond yields could be instrumented to reduce the scope for endogeneity. Reverse causality is an issue that should be taken seriously and this chapter will also instrument variables that are potentially endogenous. Lastly, system-GMM, as consistently employed in this thesis, includes level and difference equations and preserves variation in institutional variables, at least for the levels equations. Therefore, it allows for inclusion of the institutional variables from chapter 8. For these reasons, system-GMM is the method chosen for the comprehensive statistical models in this chapter. For robustness purposes, the FEVD procedure was also employed (yet results will not be reported).

9.3 Empirical Analysis

This thesis has taken considerations of both bias and efficiency seriously. However, it is mainly focused on bias induced by endogeneity due to lagged dependent variables in a time

⁵Plümper, Thomas and Tröger, Vera E. (2007) Efficient Estimation of Rarely Changing Variables in Panel Data With Unit Fixed Effects, *Political Analysis*, Vol. 15, No. 2.

series-cross sectional format and reverse causality. Yet there is another source of bias that has been treated only to a limited extent in this thesis: omitted variable bias. Griliches, for example, shows that the omission of key predictors from an empirical model can bias the inferences; this is particularly a problem when the omitted variables are correlated with the predictors that are included in the model.⁶ The thesis has opted to omit some variables for the following reasons: first, data availability differs across variables. Including controls with more limited data availability decreases the sample size, increases in turn the standard errors and decreases efficiency. The thesis has chosen efficiency over (omitted variable) bias. Second, relatedly, including more variables in a model reduces the degrees of freedom and thus the power of the analysis. Third, if certain controls are not available for some countries, these countries will have to be dropped from the analysis, reducing the external validity of the findings. Lastly, in particular for chapters that employ the GMM method, additional variables weaken the strength of the GMM instruments.

However, omitted variable bias is a source of concern that should not be taken lightly and to address this issue and wrap up the thesis, all variables from the analysis with sufficient overlap in sample size will be included in the analysis below. If there is insufficient overlap variables will have to be excluded, however. This is in particular true for the sovereign risk ratings and credit default swaps (CDS) in chapter 5, where the former doesn't have sufficiently long time series (the sample would only include 64 observations if this variable was included) and the latter does not have enough countries and time points. The third measure of sovereign risk, T-Bond yields, is of sufficient coverage, however, and will be included in the analysis. The vote intention variable also has limited overlap with the other variables. Since it is such a key variable it will be included, yet the sample size drops significantly. For this reason the analysis will be repeated without this variable. Other variables from chapter 4, polarisation and the left-right measure will be replaced with measures from the World Bank's *Database of Political Institutions* to ensure more congruent coverage.⁷ The analysis will include main and control variables from the different chapters. These variables are listed in table 9.1, where the first column gives the variable name, the second describes the variable in a bit more detail, and the third references the chapter which the variable is used in. The dependent variable is the budget balance which, as in chapter 5 and 6 is taken from the IMF's *2009 World Economic Outlook*.

⁶Griliches, Zvi (1977) Estimating the Returns to Schooling: Some Econometric Problems, *Econometrica: Journal of the Econometric Society*, Vol. 45, No. 1.

⁷Beck, Thorsten et al. (2001) New Tools in Comparative Political Economy: The Database of Political Institutions, *World Bank Economic Review*, Vol. 15, No. 1 (URL: <http://go.worldbank.org/2EAGGLRZ40>).

Table 9.1: List of variables

Variable name	Description	Chapter
Main variables		
Vote	Vote intention/ government popularity (levels)	4
Polarisation	Party system polarisation	4
LnBond	3-month T-Bond yields	5
LnVariance	Log variance in economic growth	6
Regulate	Regulation index (Gwartney & Lawson (2009))	6
Open	Openness index (Dreher 2007)	6
SingleParty	Single-party government	8
LargestParty	Vote share of the largest party in government	8
Elect	Election dummy	All
Control variables		
LnGDP	Log GDP	All
Growth	Economic growth	All
Left-Right	Left-right index	4
Trade	Current account balance	5
PartyAge	Age of democratic parties	5
Unified	Unified government dummy	8
Fraction	Party system fractionalisation	8
PR	Proportional Representation dummy	8
Presidential	Presidential system dummy	8

The empirical model to be estimated can then be expressed as follows:

$$\begin{aligned}
F_{i,t} = & \beta_0 + \beta_1 F_{i,t-1} + \beta_2 ELECT_{i,t} + \beta_3 COND.VAR_{i,t} \\
& + \beta_4 ELECT_{i,t} * COND.VAR_{i,t} + \gamma' \mathbf{X}_{i,t} + \eta_i + \lambda_t + \nu_{i,t}
\end{aligned} \tag{9.1}$$

, where $i = 1, 2, \dots, N$ and $t = 1, \dots, T$. $F_{i,t}$ is the indicator of fiscal policy, i.e. the budget balance. $ELECT$ is the election dummy, $COND.VAR$ represents the conditioning variable (see the main variables in table 9.1) and the interaction between the two variables is given by $ELECT * COND.VAR$. Conforming with the previous chapters, the model includes a lagged dependent variable, $F_{i,t-1}$. Control variables are given as $\gamma' \mathbf{X}_{i,t}$. The parameters η_i and λ_t are the country and time specific error terms while $\nu_{i,t}$ indicates the overall error. The β 's represent the parameters to be estimated. This model will be estimated with the system-GMM estimator in the same fashion as in chapters 5 and 6. Given the number of regressors and the sample characteristics, only two lags will be used for the endogenous regressors. A subsidiary analysis suggests that the T-Bond measure and the one for the variance in economic growth are endogeneous and will thus be instrumented (with two lags). Endogeneity of the vote intention variable was addressed through the specific

lag structure. To be safe, the analysis below also treats it as endogenous for additional confidence but this procedure does not alter the results in any substantive way. Table 9.2 reports the results when including the vote intention variable.

Previous chapters have also reported the FE and pooled estimates for the LDV to check model specification. These estimates are omitted here to keep the tables parsimonious. The FE coefficient for the LDV is 0.64 (with a standard error of 0.08) and the pooled one is 0.80 (with a standard error of 0.05). Inspecting table 9.2 indicates that the LDV coefficients for the GMM model lie in between the FE and pooled estimate, suggesting that the model is correctly specified. With first-order but no second-order autocorrelation in the first-differenced residuals the instruments are also acceptable.

The results in the table are disappointing. Except for the measure of the largest party (*LargestParty*, from chapter 8) none of the interaction terms are significant.⁸ This is not surprising, however, since the sample size is so small. For the vote intention variable (*Vote*) it is also not surprising that the results do not uphold since the sample would have to be split into high and low polarisation samples - with this small sample size and the number of variables this is no longer feasible. A cubic form of the vote function was estimated to check for the predicted nonlinearities but constituent terms are dropped due to collinearity. To gain confidence on the effect of vote intention on the budget deficit the sample with all the controls is simply too small. Is the vote intention variable the reason that the other predicted effects are insignificant? The analysis was repeated with the same number of observations but excluding the vote intention variable, to see whether the statistical insignificance of the other variables is a result of controlling for vote intention. This is not the case. Thus, the weak results are likely a consequence of the small sample size.⁹

Table 9.3 reports the same analyses without the vote intention variable. Moreover, the left-right measure and the polarisation measure, from the *Comparative Manifesto Project* in chapter 4 and table 9.2 are replaced by measures taken from the DPI to ensure longer coverage (time series thus range from 1980 to 2006).¹⁰ Again, the FE and pooled LDV coefficient estimates are not reported in the table: they are 0.73 (with a standard error of 0.05) and 0.89 (with a standard error of 0.04) respectively and the autocorrelation structure

⁸Note that the analysis in column 9 is, as in chapter 8, restricted to coalition governments. The election dummy was adjusted as in chapter 8 to only consider majority coalitions. In this sample, there are no single party governments and no presidential governments which is why no coefficients are estimated for these variables in column 9. This also holds for table 9.3.

⁹Note also that the only significant result in column 9 is based on 78 observations, making the inferences of this analysis questionable.

¹⁰The variables are strongly and positively correlated.

Table 9.2: Empirical reprise I: including vote intention

Dep. variable	Budget balance			
Model	(1)	(2)	(3)	(4)
Cond. variable	-	Vote	Polar.	LnBond
Balance (L1)	0.79*** (0.07)	0.78*** (0.06)	0.79*** (0.07)	0.79*** (0.06)
LnGDP	1.32 (0.89)	1.38* (0.84)	1.35 (0.87)	1.54* (0.79)
Growth	0.17*** (0.06)	0.15*** (0.05)	0.16*** (0.06)	0.16*** (0.06)
Left-Right	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.01)	-0.02 (0.02)
Trade	0.04 (0.05)	0.08* (0.05)	0.05 (0.05)	0.06 (0.05)
PartyAge	-0.01 (0.00)	0.00 (0.00)	-0.01 (0.00)	0.00 (0.00)
Unified	0.23 (0.26)	0.33 (0.24)	0.24 (0.25)	0.33* (0.20)
Fraction	-3.24* (1.77)	-4.03** (1.96)	-3.36** (1.71)	-3.26 (2.05)
PR	0.10 (0.29)	0.20 (0.33)	0.09 (0.30)	0.17 (0.35)
Presidential	0.34 (0.37)	0.29 (0.39)	0.36 (0.38)	0.32 (0.38)
Vote	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Polarisation	0.01 (0.04)	0.02 (0.04)	0.00 (0.04)	0.01 (0.04)
LnBond	0.68*** (0.25)	0.57*** (0.21)	0.67*** (0.25)	0.62** (0.24)
LnVariance	0.04 (0.10)	0.03 (0.10)	0.04 (0.10)	0.02 (0.12)
Regulate	-0.26 (0.27)	-0.31 (0.29)	-0.27 (0.27)	-0.33 (0.24)
Open	0.03** (0.01)	0.03** (0.02)	0.03** (0.01)	0.03** (0.02)
SingleParty	0.22 (0.35)	-0.07 (0.31)	0.23 (0.34)	-0.06 (0.29)
LargestParty	0.45 (0.79)	0.49 (0.71)	0.37 (0.76)	0.95 (0.80)
Elect	-0.35* (0.21)	-0.60 (0.55)	-0.33 (0.36)	-0.34 (0.35)
Elect x Cond. Var.		0.01 (0.01)	0.00 (0.03)	-0.03 (0.19)
AR(1) ^a	-2.63 (0.01)	(0.013) (0.01)	-2.63 (0.01)	-2.64 (0.01)
AR(2) ^a	0.72 (0.47)	0.78 (0.43)	0.70 (0.48)	0.82 (0.41)
No. countries	15	15	15	15
No. obs	151	151	151	151

*** p<0.01, ** p<0.05, * p<0.01; standard errors in parentheses

a: p-values in parentheses

Table 9.2 continued

Dep. variable	Budget balance				
Model	(5)	(6)	(7)	(8)	(9)
Cond. variable	LnVar.	Regulate	Open	SingleP.	LargestP.
Balance (L1)	0.78*** (0.06)	0.79*** (0.07)	0.78*** (0.06)	0.79*** (0.07)	0.67*** (0.12)
LnGDP	1.38* (0.82)	1.28 (0.92)	1.42* (0.86)	1.17 (0.87)	3.47*** (1.01)
Growth	0.16** (0.06)	0.16*** (0.06)	0.16*** (0.06)	0.15*** (0.05)	0.13* (0.08)
Left-Right	-0.02 (0.02)	-0.02 (0.01)	-0.02 (0.02)	-0.02 (0.01)	-0.05 (0.03)
Trade	0.06 (0.05)	0.04 (0.05)	0.04 (0.05)	0.05 (0.05)	-0.11 (0.08)
Party Age	-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)	-0.02** (0.01)
Unified	0.33 (0.24)	0.25 (0.25)	0.31 (0.22)	0.39 (0.29)	1.47*** (0.40)
Fraction	-3.39* (1.96)	-2.94 (1.96)	-2.98* (1.70)	-2.60* (1.56)	-7.44** (3.25)
PR	0.04 (0.31)	0.10 (0.29)	0.07 (0.30)	0.09 (0.28)	0.76* (0.43)
Presidential	0.36 (0.41)	0.44 (0.38)	0.41 (0.37)	0.25 (0.46)	N/A N/A
Vote	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.02** (0.01)
Polarisation	0.01 (0.05)	-0.02 (0.04)	0.00 (0.04)	-0.01 (0.04)	0.30*** (0.10)
LnBond	0.60** (0.24)	0.63** (0.26)	0.66** (0.27)	0.61** (0.25)	0.83** (0.37)
LnVariance	0.09 (0.13)	0.04 (0.10)	0.05 (0.10)	0.02 (0.10)	0.26** (0.12)
Regulate	-0.24 (0.28)	-0.36 (0.27)	-0.26 (0.27)	-0.19 (0.21)	-0.94* (0.53)
Open	0.04** (0.01)	0.03** (0.01)	0.03** (0.01)	0.03** (0.01)	0.06*** (0.01)
SingleParty	0.29 (0.34)	0.29 (0.38)	0.23 (0.35)	0.29 (0.34)	N/A N/A
LargestParty	0.32 (0.76)	0.32 (0.81)	0.51 (0.79)	0.50 (0.76)	-0.80 (0.76)
Elect	-0.53 (0.42)	-2.77 (1.86)	-0.21 (1.07)	-0.27 (0.68)	1.67*** (0.19)
Elect x Cond. Var.	-0.05 (0.21)	0.34 (0.26)	0.00 (0.01)	-0.86 (0.70)	-4.04*** (0.78)
AR(1) ^a	-2.65 (0.01)	-2.59 (0.01)	-2.63 (0.01)	-2.54 (0.01)	-2.12 (0.00)
AR(2) ^a	0.82 (0.41)	0.59 (0.56)	0.75 (0.45)	0.51 (0.61)	0.51 (0.60)
No. countries	15	15	15	15	10
No. obs	151	151	151	151	78

*** p<0.01, ** p<0.05, * p<0.01; standard errors in parentheses

a: p-values in parentheses

Table 9.3: Empirical reprise II: excluding vote intention

Dep. variable	Budget balance			
Model	(1)	(2)	(3)	(4)
Cond. variable	-	Polar.	LnBond	LnVar.
Balance (L1)	0.87*** (0.04)	0.86*** (0.04)	0.87*** (0.04)	0.86*** (0.05)
LnGDP	-0.28 (0.82)	-0.29 (0.82)	-0.17 (0.89)	-0.26 (0.67)
Growth	0.30*** (0.07)	0.30*** (0.07)	0.30*** (0.08)	0.31*** (0.06)
Left-Right	-0.11 (0.34)	-0.11 (0.34)	-0.18 (0.28)	-0.18 (0.27)
Trade	0.04 (0.09)	0.04 (0.09)	0.10 (0.09)	0.05 (0.08)
PartyAge	0.00 (0.01)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)
Unified	0.19 (0.36)	0.21 (0.35)	0.21 (0.22)	-0.08 (0.20)
Fraction	-1.22 (2.55)	-1.06 (2.59)	-1.36 (2.43)	-0.84 (2.31)
PR	0.49 (0.46)	0.44 (0.49)	0.53 (0.36)	0.17 (0.30)
Presidential	1.20 (0.96)	1.20 (0.97)	0.64 (0.51)	0.67 (0.60)
Polarisation	-0.32 (0.24)	-0.29 (0.26)	-0.28 (0.20)	-0.33 (0.20)
LnBond	-0.49*** (0.18)	-0.51*** (0.18)	-0.38** (0.16)	-0.38** (0.16)
LnVariance	0.16* (0.09)	0.17* (0.09)	0.14 (0.11)	0.09 (0.11)
Regulate	0.00 (0.42)	0.00 (0.42)	0.15 (0.44)	0.07 (0.43)
Open	0.05** (0.02)	0.06** (0.02)	0.04* (0.02)	0.05*** (0.02)
SingleParty	-0.49 (0.33)	-0.49 (0.33)	-0.60 (0.40)	-0.57 (0.37)
LargestParty	2.08 (1.98)	2.08 (1.97)	2.40 (2.15)	2.23 (1.95)
Elect	-0.19 (0.23)	-0.05 (0.23)	-0.90*** (0.18)	-0.01 (0.35)
Elect x Cond. Var.		-0.12 (0.13)	0.35*** (0.11)	0.16 (0.20)
AR(1) ^a	-3.08 (0.00)	-3.09 (0.00)	-2.98 (0.00)	-2.88 (0.00)
AR(2) ^a	-0.74 (0.46)	-0.46 (0.64)	-0.42 (0.67)	-1.08 (0.28)
No. countries	18	18	18	18
No. obs	215	215	215	215

*** p<0.01, ** p<0.05, * p<0.1; standard errors in parentheses

a: p-values in parentheses

Table 9.3 continued

Dep. variable	Budget balance			
Model	(5)	(6)	(7)	(8)
Cond. variable	Regulate	Open	SingleP.	LargestP.
Balance (L1)	0.87*** (0.05)	0.86*** (0.04)	0.83*** (0.04)	0.68*** (0.05)
LnGDP	-0.25 (0.83)	-0.26 (0.80)	-0.13 (0.78)	0.54 (0.73)
Growth	0.29*** (0.07)	0.30*** (0.07)	0.34*** (0.06)	0.36*** (0.08)
Left-Right	-0.13 (0.32)	-0.12 (0.34)	-0.20 (0.23)	0.25 (0.22)
Trade	0.04 (0.09)	0.04 (0.09)	-0.01 (0.05)	-0.05 (0.08)
Party Age	0.00 (0.01)	0.00 (0.01)	0.01 (0.00)	0.02*** (0.01)
Unified	0.25 (0.34)	0.24 (0.35)	0.49 (0.46)	0.77 (0.53)
Fraction	-1.15 (2.59)	-1.42 (2.57)	1.24 (3.37)	1.59 (3.89)
PR	0.54 (0.47)	0.54 (0.46)	0.012 (0.52)	-1.86*** (0.49)
Presidential	1.24 (1.03)	1.16 (0.95)	0.58 (0.90)	N/A N/A
Polarisation	-0.34 (0.22)	-0.31 (0.23)	-0.19 (0.23)	0.39* (0.20)
LnBond	-0.53*** (0.18)	-0.49*** (0.18)	-0.42** (0.20)	-0.65** (0.26)
LnVariance	0.15 (0.09)	0.15 (0.09)	0.15* (0.08)	-0.02 (0.09)
Regulate	-0.14 (0.46)	0.02 (0.42)	0.43 (0.38)	1.14*** (0.32)
Open	0.06*** (0.02)	0.05** (0.02)	0.05** (0.02)	0.03** (0.01)
SingleParty	-0.46 (0.32)	-0.49 (0.33)	0.10 (0.26)	N/A N/A
LargestParty	1.66 (1.85)	1.95 (1.98)	1.43 (1.74)	2.74 (2.03)
Elect	-5.19** (2.33)	-0.81 (1.38)	-1.14** (0.48)	0.73 (0.85)
Elect x Cond. Var.	0.70** (0.32)	0.01 (0.02)	-0.76 (0.65)	-1.88* (1.13)
AR(1) ^a	-3.05 (0.00)	-3.11 (0.00)	-3.20 (0.00)	-2.46 (0.01)
AR(2) ^a	-1.25 (0.21)	-0.91 (0.36)	-1.60 (0.11)	-0.93 (0.35)
No. countries	18	18	18	13
No. obs	215	215	269	120

*** p<0.01, ** p<0.05, * p<0.01; standard errors in parentheses

a: p-values in parentheses

suggests that the instruments are acceptable. This suggests that the model is correctly specified.

The interaction effects now look more promising. The T-Bond measure (*LnBond*), the regulation index (*Regulate*), and the largest party variable (*LargestParty*) are all correctly signed and statistically significant, thus corroborating key findings from chapters 5, 6, and 8. The other variables are all correctly signed but not statistically significant. Again, this is likely to be due to the sample size. For example, for the measure of economic volatility (*LnVariance*), the sample size is cut in half, compared to chapter 6. Thus, overall, the results look encouraging. Re-estimating this model with the FEVD procedure, including the LDV, and accounting for time-invariant variables yields similar results, further supporting the arguments of this thesis.

9.4 Conclusion

This thesis has put forward a number of arguments about the contextual determinants of political budget cycles. The arguments were derived in theoretical models and tested empirically. Whilst individual chapters have focused on isolating the effect of specific factors under consideration on the budget balance this chapter wraps up the empirical analysis by including all factors in one comprehensive empirical model. The chapter has reiterated that the methodology for individual chapters was chosen very carefully, paying attention to trade-offs with regard to bias and efficiency. One source of bias, omitted variable bias, was traded off against other desirable model features. This last chapter has addressed this last source of bias by including all variables shown in previous chapters to affect political budget cycles in one grand empirical model. The empirical results are relatively positive, even though some effects vanish, most likely due to the decreased sample size. However, overall the results are reassuring since they are overall relatively supportive.

Chapter 10

Conclusion

10.1 Introduction

Sir William McMahon, Australia's longest continuously serving Prime Minister, summed up his profession by saying: "politics is trying to get into office." Electoral competition, the contest for public office, is at the heart of politics in a democratic society and this thesis has looked at one tool that governments may choose to prevail in this competition: strategic borrowing before elections. The dynamics of public debt thus have a political dimension, induced by governments trying to enhance their electoral fate. The thesis has explored this dimension in great detail, in particular by examining the political, economic, and institutional contexts that condition political budget cycles.

The story told by this thesis is built on strong microfoundations where the mechanism that gives rise to political budget cycles was examined in great detail in part I. Several models of strategic debt were discussed and contrasted and the model type that emerged as the most suitable from this discussion was subjected to rigorous empirical tests of its key underlying assumption. This model, a moral hazard type model of political budget cycles, then formed the basis for all substantive analyses in the subsequent two parts. Part II examined governments' motives to borrow, looking at the costs and benefits from strategic debt, with a particular emphasis on party system polarisation, government popularity, and sovereign risk. Part III then took the motives for borrowing as given and examined the effectiveness of debt as a strategic instrument. In this light, the three parts logically build up to illuminate several interdependent aspects of strategic borrowing. Each chapter thereby incorporates insights from a large research tradition to extend existing arguments as well as to arrive at altogether new conclusions. The theoretical analyses are underpinned by empirical findings that generally support the argument. The thesis thus provides one of the most extensive and comprehensive treatments of context-conditional budget cycles.

This chapter summarises and synthesises the insights gained in the previous chapters. The next section will pay particular attention to model selection, which occupied part I of the thesis, and summarise what has been learned about modeling the incentives for strategic borrowing. Part I constituted an essential part of this thesis as it developed the basis for the theoretical analysis in the subsequent two parts that looked at different contextual features and their impact on incentives for electioneering. Section three will summarise the findings that have been derived in these two parts, parts II and III. Section four will then discuss the scope of the thesis. Section five will explain as to how the thesis contributes to the academic discourse and section six will examine its wider implications. The last section will point to

issues that the thesis has left unresolved and that provide avenues for future research.

10.2 Models and Assumptions

Nobel Laureate Milton Friedman suggested that theoretical models should be judged by their predictive power.¹ He saw assumptions as short-cuts to reduce complexity by treating certain underlying mechanisms *as if* they were considerably simpler than they may in reality be, and thus merely as heuristic devices. His recommendation proved controversial but it constitutes one benchmark against which to judge different models that aim at explaining the same phenomenon. Part I of this thesis has shown that there are many theoretical models in the literature that can potentially explain fluctuations in the budget balance during election times. These models have hitherto stood alongside each other which means that there are many, often competing, possible explanations for political budget cycles. This thesis has aimed to fit these models into an analytical structure and evaluate them based on certain criteria. To this end, Friedman's criterion of predictive power was supplemented by the criteria of generality and the realism of underlying assumptions. In particular the emphasis on realistic assumptions is noteworthy. It contrasts with Friedman's recommendation but, it was argued, is an important consideration when evaluating the *explanatory* power of a theoretical model.

Chapter 2 argued that models that emphasise how governments may abuse fiscal policy in order to exploit a reputational advantage are rather specific and at times based on weak assumptions.² Models that emphasise the time-inconsistency problem of public debt, which enables governments to borrow during their term and leave the financing to their successor, are particularly interesting when analysing unpopular governments, and thus also rather specific.³ The most general type of models, it was argued, are models that emphasise governments' incentives to appear competent. These models fall into two categories: models emphasising the adverse selection problem and those emphasising moral hazard. In the adverse selection model, governments observe their own competence and rely on deficits to

¹Friedman, Milton (1953) *Essays in Positive Economics*, Chicago, IL: University of Chicago Press.

²These models were presented in Aghion, Patrick and Bolton, Philippe (1990) Government Domestic Debt and the Risk of Default: A Political-Economic Model of the Strategic Role of Debt, In Dornbusch, Rudiger and Draghi, Mario, editors *Capital Markets and Debt Management*, Cambridge, MA: MIT Press; Milesi-Ferretti, Gian Maria and Spolaore, Enrico (1994) How Cynical Can an Incumbent Be? Strategic Policy in a Model of Government Spending, *Journal of Public Economics*, Vol. 55; Milesi-Ferretti, Gian Maria (1995) Do Good Or Do Well? Public Debt Management in a Two-Party Economy, *Economics and Politics*, Vol. 7, No. 1.

³These models were presented in Persson, Torsten and Svensson, Lars E.O. (1989) Why Would a Stubborn Conservative Run a Deficit: Policy with Time-Inconsistent Preferences, *Quarterly Journal of Economics*, Vol. 104; Alesina, Alberto and Tabellini, Guido E. (1990) A Positive Theory of Fiscal Deficits and Government Debt, *The Review of Economic Studies*, Vol. 57, No. 3.

signal their competence to voters;⁴ in the moral hazard model, governments do not observe their competence but try to feign competence.⁵ It was argued that the moral hazard model was analytically superior due to more realistic assumptions. To bolster this argument, chapter 3 tested the moral hazard assumption. The evidence from that chapter favours the moral hazard model over the adverse selection model. Chapters 2 and 3 in part I of this thesis constitute the first attempt in the literature to arbitrate between these competing models. The insights gained strengthen the findings of the subsequent chapters in Parts II and III since they are built on a strong theoretical model; but they may also benefit future researcher since they provide valuable guidance on model selection.

10.3 Context and Strategic Debt

Discussing different models of strategic debt has given rise to the first examination of how context affects incentives for strategic debt, in chapter 4. If governments have an incentive to feign competence before an election but borrowing is costly, they are likely to want to borrow when electioneering will be decisive for the election. Therefore, the moral hazard model predicts that pre-election deficits are highest when the race between the governments and its challengers is neck-on-neck. Polarisation adds a second dimension to this calculus. Models that emphasise future constraints teach that governments may wish to finance their preferred expenditure with debt when they anticipate electoral defeat, thus pre-empting adverse shifts in policy enacted by another government. The higher the degree of polarisation, the larger will be the incentive to constrain a successive government since challengers are likely to have different spending priorities in a polarised system. As polarisation increases, chapter 4 has argued, this incentive to constrain the successor increasingly dominates incentives for feigning competence. For this reason, when polarisation is low the effect of government popularity on pre-election deficits is non-linear, first increasing to the point where competition is the tightest, and then decreasing. When polarisation is high, the deficit will increase and the effect of government popularity on deficits becomes increasingly linear, resulting in higher debt at lower levels of popularity. These findings are only partly

Table 10.1: Context and strategic debt

Chapter	Context	Effect	Mechanism
Part II: Costs & Benefits			
4	Polarisation	+	Polarisation increases the relative value of holding office.
	Vote intention	+/-	Low polarisation: gain swing-votes when race is tight. High polarisation: constrain likely successor.
5	Sovereign risk	-	Sovereign risk increases the relative cost of strategic borrowing.
Part III: Signal Extraction			
6	Economic volatility	-	Economic volatility blurs the government's competence signals.
	Number of economic actors	-	As the number of nonelectorally dependent decision makers increases, voters cannot easily disentangle government competence.
7 & 8	Coalition government	-	A fraction of shocks to government competence will be attributed to coalition partners.
	Size of the largest party in government	+	Larger parties receive greater credit for boosts to government competence.

borne out by the data, however.

These and all other findings from parts II and III are summarised in table 10.1. The table separately lists the findings for part II, in the top part, and for part III in the bottom part. The first column indicates the chapter in which the findings were developed, the second column lists the specific context under consideration. The third and fourth columns summarise the overall effect of the contextual factor under consideration on the budget balance in election years. Part II looked at the costs and benefits, in other words governments' motives, to manipulate the budget before elections. Apart from the contextual analysis of polarisation and vote intention, part II also looked at sovereign risk. Whilst polarisation and the likelihood of re-election increase the value of retaining office, sovereign risk decreases it. It was argued that borrowing is costly. For this reason, the more expensive it is to feign competence the less willing governments will be to accumulate strategic debt. Sovereign risk is a key determinant of the cost of borrowing and for this reason, it was shown, it dampens the political budget cycle.

⁴Rogoff, Kenneth and Sibert, Anne (1988) Elections and Macroeconomic Policy Cycles, *The Review of Economic Studies*, Vol. 55, No. 1.

⁵Persson, Torsten, Roland, Gérard and Tabellini, Guido E. (2000) Comparative Politics and Public Finance, *The Journal of Political Economy*, Vol. 108, No. 6; Shi, Min and Svensson, Jakob (2006) Political Budget Cycles: Do They Differ Across Countries and Why? *Journal of Public Economics*, Vol. 90, No. 8-9; Alt, James E. and Lassen, David Dreyer (2006a) Fiscal Transparency, Political Parties, and Debt in OECD Countries, *European Economic Review*, Vol. 50, No. 6.

Part III then turned to signal extraction. Even if governments have a motive to borrow strategically, public debt may not be an effective tool to feign competence. For this reason, part III looked at contextual features that may decrease the effectiveness of debt as a strategic instrument. The argument looked at two distinct factors that may blur competence signals. First, it turned to nonelectorally dependent decision makers. These actors do not run for public office but do contribute to economic performance. When voters go to the polls to select a competent government, they will try to disentangle the government's most recent individual competence shock from overall performance shocks. It was shown that both economic volatility and the number of non-government economic actors, proxied in chapter 6 through economic openness and regulatory density, impede the extraction of the governments' competence shock, thus making debt a relatively ineffective strategic instrument. Since it is a rather ineffective tool in these settings, governments will be less likely to employ it before elections, which, as was shown, in turn reduces the magnitude of political budget cycles.

Lastly, chapters 7 and 8 turned to electorally dependent decision makers, with a particular eye on signal extraction under coalition government. It was shown that the analysis of coalition government is complex because of multiple different dimensions and has to incorporate several individual research strands. For this reason, two chapters were devoted to this issue. Chapter 7 developed a theoretical argument of individual coalition partners' incentives to borrow before elections and then discussed how these incentives are likely to be translated into outcomes. Chapter 8 then tested these empirical implications in a statistical analysis. It was shown that political budget cycles are smaller under coalition than single-party government because voters will attribute a fraction of shocks to coalition partners. This makes it less profitable for each individual party to borrow before elections. However, it was also shown that the incentive to borrow increases for larger coalition partners because they will receive greater credit for boosts to government competence. To the extent that these parties can implement their preferences and turn them into policy, larger, or more powerful, coalition parties tend to accelerate borrowing before elections. These predictions are borne out rather well by the data.

All individual analyses in parts I to III have focused on isolating the specific contextual effects discussed in each chapter. Control variables in these chapters were chosen on a relatively minimalist basis in order to maximise the sample size and number of included countries/ years (and accordingly external validity), and to improve the quality of instrumental variables. However, this approach increased the scope for omitted variable bias.

Chapter 9 therefore included all variables considered in the individual chapters to be important predictors of political budget cycles in one comprehensive model. Generally, the results uphold and it was argued that where they do not, it is largely a size of the reduced sample size due to limited data overlap. The arguments are thus largely corroborated by the data.

10.4 Scope of the Thesis

One of the key strengths of this thesis is that it uses the most recent available data for the analysis of political budget cycles, up to the year 2008 in some chapters, in particular chapters 5 and 6. For robustness purposes, such recent data were also used in chapters 8 and 9. To maximise the number of observations and to foster comparability amongst different studies of context-conditional political budget cycles, already existing datasets were also employed. Chapters 4 and 8 largely relied on a vast dataset assembled by Brender and Drazen, spanning a period of over 40 years up the year 2001 and including data from both developed and developing countries.⁶ In chapter 4 this allowed to include time series beginning in the 1970s - and in chapter 8 it additionally allowed to include more developing countries. Thus, the choice of the datasets allowed to maximise the scope of the thesis over space and time.

However, it should be noted that, with the exception of chapter 8 and the study of coalition government, developing countries are underrepresented in this thesis. This is in particular due to data availability. There is a prominent argument in the literature that political budget cycles are particularly weak in developed countries.⁷ Thus, focusing on developed countries in the analysis was particularly challenging and unless there are systematic underlying differences between developed and developing countries affecting the relationships discovered in this thesis, the findings are likely to be even stronger in developing countries.

10.5 Contribution to the Literature

This thesis makes a few important contributions to the academic discourse. One such contribution, already alluded to above, is the discussion of several theoretical models that have been proposed to study political budget cycles. This discussion was thorough, both combining the evidence in support of different theories from the existing literature, but also

⁶Brender, Adi and Drazen, Allan (2005) Political Budget Cycles in New versus Established Democracies, *Journal of Monetary Economics*, Vol. 52, No. 7.

⁷Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 6); Shi and Svensson (2006) *Journal of Public Economics* (as in n. 5).

directly testing the key assumption of the model that seems to have the greatest explanatory power, the moral hazard model. The moral hazard model has been widely used already;⁸ this thesis adds ex-post justification for this but also encourages future use of this model type for the study of strategic deficits.

Secondly, the thesis has added significantly to a growing literature on context-conditional political budget cycles by turning to additional features that influence governments' incentives to borrow before elections. In doing so, it has incorporated insights from many different strands of academic research, including voting behaviour, institutional analysis, and even finance. A good illustration of this is chapter 6 which heavily draws on the economic voting literature. Whilst this literature examines how voters respond to government output, this thesis has taken the argument one step further: since governments are vote-seekers, they will want to choose policies that maximise their vote share. When the economic vote is suppressed, for example due to a volatile economy, it is not profitable to appeal to voters on this economic dimension and the incentive to feign economic competence is dampened. Thus, this thesis has incorporated insights from different areas of research to generate largely new findings.

A third contribution is that it holds against an often foregone conclusion that political budget cycles are close to non-existent in developed, established democracies. Although the evidence in this thesis does show that strategic debt in these countries is relatively small, the thesis also shows that depending on the context, political budget cycles do exist, even in the developed world. For example, unpopular governments in polarised systems, in relatively closed economies, or with low borrowing costs, or, indeed, single-party governments, are likely to borrow before elections in developed democracies. A new literature is currently emerging that is often labelled 'strategic budgeteering': instead of borrowing before elections, governments shuffle spending items in an attempt to win votes. Drazen and Eslava justify this approach by arguing that "there is a significant amount of evidence that increasing aggregate spending or deficits before an election is not an effective tool to gain votes."⁹ The argument is valid. This thesis has shown that voters do not respond to expenditure boosts in election years, so governments do not gain from strategic debt. However, the thesis has also argued that political budget cycles result from a moral hazard problem in which political budget cycles occur because they are *expected*. The fact that strategic debt does not

⁸See, e.g. Persson, Torsten and Tabellini, Guido E. (2000) *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press; Shi and Svensson (2006) *Journal of Public Economics* (as in n. 5); Alt, James E. and Lassen, David Dreyer (2006b) Transparency, Political Polarization, and Political Budget Cycles in OECD Countries, *American Journal of Political Science*, Vol. 50, No. 3.

⁹Drazen, Allan and Eslava, Marcela (2008) Electoral Manipulation via Expenditure Composition: Theory and Evidence, *NBER Working Paper*, p. 1.

help politicians to get re-elected thus does not weaken the argument about political budget cycles *vis-à-vis* strategic budgeteering. The two literatures can complement each other, yet one does certainly not preclude the other. Political budget cycles are a by-product of the democratic process and even though their size may be context-conditional, they are still a phenomenon worth studying.

10.6 Wider Implications

Against the backdrop of the 2007-2010 global financial and economic crisis, this thesis is topical and the insights are likely to be interesting to a relatively diverse audience. Public debt levels have mushroomed in many countries, both in the developed and the developing world. Voters, politicians, investors, and regulators alike will be wary of the dynamics of public debt in this environment and the thesis provides them with interesting conjectures to speculate about fiscal policy before upcoming elections. For example, a volatile economic environment, as during this crisis, is likely to dampen strategic borrowing. Similarly, the potential or actual downgrading of sovereign credit ratings in many countries, most notably in Greece in early 2010, raises the cost of public debt and lowers governments' motives to borrow strategically. Thus, political budget cycles can be expected to be relatively small in the economic environment following the 2007 credit crunch.

Irrespective of the topicality of the subject, this thesis has a number of interesting, normative implications. Political budget cycles are a social inefficiency, in other words the 'price of democracy'.¹⁰ It would thus be desirable to avoid them. Politicians are responsible for policies and they respond to incentives that are to an extent a product of institutions. Buchanan thus argues that "to improve politics, it is necessary to improve or reform rules, the framework within which the game of politics is played. There is no suggestion that improvement lies in the selection of morally superior agents who will use their powers in some 'public interest'."¹¹ To avoid political budget cycles, incentive structures must change. At the core of strategic debt, as this thesis has shown, lies the moral hazard problem. Moral hazard is a consequence of insufficient monitoring. To contain strategic debt, government accountability would thus have to be increased, especially in election years.

This can be done in multiple ways. One possible solution can be derived from studies

¹⁰Block, Steven A. and Vaaler, Paul M. (2004) The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries, *Journal of International Money and Finance*, Vol. 23, No. 6.

¹¹Buchanan, James M. (1989b) *Explorations into Constitutional Economics*, College Station, TX: Texas A & M University Press, p.18.

on fiscal transparency which increases accountability and thus remedies the problem at its root. Indeed, Alt and Lassen show that fiscal transparency reduces the magnitude of political budget cycles.¹² Another possible way is to increase citizen awareness by a more comprehensive coverage of fiscal policy in the media, as can be inferred from Shi and Svensson's studies of political budget cycles in developed and developing countries.¹³ Lastly, political sophistication is likely to be an important factor that determines how well voters can hold governments accountable. An improvement in political education would thus likely reduce public borrowing in election years.

In fighting the symptoms, rather than the cause of the problem, the thesis provides limited advice.¹⁴ Certainly, one cannot change the political system as to reduce political polarisation or to change the structure of the economy to increase volatility. Increasing the cost of borrowing deliberately would result in smaller political budget cycles but also hurt government investment. Coalition government is associated with less strategic debt - but that is a consequence of the electoral system. In the United Kingdom, electoral reform is one of the key campaign controversies of the 2010 election. If a form of PR was adopted in Britain, which would likely result in more frequent coalition government, strategic debt would probably decrease. However, whilst this may be an interesting consideration for British voters, electoral reform does not happen often across the world; and constraining electioneering every four years may not be the most important criterion for reform. Yet the insights this thesis has generated do have implications for institutional design which may at least play a small role in determining the structure of future political systems.

10.7 What Remains to be Done?

This thesis has derived interesting propositions and provided some robust empirical evidence of context-conditional political budget cycles. However, it still has a number of shortcomings. For one, the restricted data availability means that developed democracies are represented disproportionately in the empirical analyses. Future research should extend the analysis to developing countries. Moreover, the evidence from chapter 4 should be reviewed to obtain more conclusive results. This will also largely depend on the availability of data. Given the pervasiveness of opinion polls in contemporary politics, more attention should be

¹²Alt and Lassen (2006a) *European Economic Review* (as in n. 5); Alt and Lassen (2006b) *American Journal of Political Science* (as in n. 8).

¹³Shi and Svensson (2006) *Journal of Public Economics* (as in n. 5).

¹⁴Looking at other studies in the literature, fiscal rules appear to be one possibility to constrain governments' ability to borrow before elections, see in particular Rose, Shanna S. (2006) Do Fiscal Rules Dampen the Political Business Cycle? *Public Choice*, Vol. 128, No. 3.

devoted to disentangling the effect of government popularity on pre-election deficits. This thesis has suggested that polarisation may be the key to uncovering the nuances of this relationship. Again, expanding the analysis to include developing countries where political budget cycles are more pronounced is likely to yield stronger results.

Coalition government is another area that more research should be devoted to. The thesis has only taken a first step in this direction. As was shown, the analysis is very complex due to the multi-dimensional nature of coalition politics with many different protagonists. The theoretical model could be further enhanced to better incorporate this multi-dimensionality and immediately derive the equilibrium deficit for the model for different coalition constellations. The model in chapter 7 has concentrated on signal extraction. However, subsidiary results were presented that show how different contextual features can provide further insights into the effect of coalition government on strategic debt. It should also be noted that coalition government is a particularly pronounced feature of developed countries - this provides a potential alternative, institutional, explanation to the empirical finding that developing countries have larger political budget cycles. Taken together, coalition government thus provides promising avenues for future research.

Another issue that should be further explored is the endogenous timing of elections. Governments might call elections when they are doing economically well.¹⁵ Such endogeneity may bias empirical estimates. This thesis has largely ignored endogenous elections because they do not appear to pose a serious problem empirically.¹⁶ However, the issue deserves further and closer examination.

Lastly, more research should be devoted to the costs of strategic debt. The estimates in this thesis indicate that deficits increase by about 0.5 to 1% of GDP in election years. However, this is only the amount of government borrowing that voters will have to re-pay in the future. As this thesis has argued throughout, deficits are costly and these costs go beyond the mere amortisation of debt. They include interest payments as well as distortions to the real economy which are likely to be considerable. If political budget cycles are the ‘price of democracy’, it will be desirable to understand what this price is. The higher it is, the more valuable will be the insights derived from this thesis on electoral competition and the dynamics of public debt.

¹⁵Kayser, Mark Andreas (2005) Who Surfs, Who Manipulates? The Determinants of Opportunistic Election Timing and Electorally Motivated Economic Intervention, *The American Political Science Review*, Vol. 99, No. 1.

¹⁶See, e.g. Brender and Drazen (2005) *Journal of Monetary Economics* (as in n. 6); Schleiter, Petra and Morgan-Jones, Edward (2009) Constitutional Power and Competing Risks: Monarchs, Presidents, Prime Ministers, and the Termination of East and West European Cabinets, *The American Political Science Review*, Vol. 103, No. 3; Hanusch, Marek (2009) The Economy and Political Budget Cycles, (URL: <http://ssrn.com/abstract=1456795>.) – visited on 3 November 2009.

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