ESSAYS ON THE POLITICAL ECONOMY OF ECONOMIC POLICIES AND PUBLIC SECTOR INSTITUTIONS IN DEVELOPING COUNTRIES

by

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Table of Contents

Preface

It has been said that writing is like travelling. It might be added that researching an issue is like exploring a new country. You travel into territory which is more or less unknown to you, and usually also to a greater or lesser extent uncharted by others. You might have the benefit of a general description of the country and its people or even a guide book, but more often than not you will have to make do with a book of puzzles and riddles that have to be solved in order for you to be able to move on. Thus, on the road you are as likely to camp by the wayside, on the top of windy mountains, or in deep misty valleys as in a cosy traveller's inn.

Like writing, researching can be a solitary journey. Still, you encounter many different individuals along the way. The people you meet can be divided into three groups. There are some who would have made great careers in the tourist agencies of one of the former communist countries. They keep you waiting forever and never give you the help you need. To the second group belong those who are too polite to admit that they have no clue about what you are asking for and therefore points out a direction by chance. Finally, you always (sometimes when you least expect it) meet people who go out of their way to aid your travels, whether it be by providing shelter, food, directions, or just plain good company. These are the ones who become ingrained in your memory, overshadowing even the scenery and great historical sites you see on your trip.

I have been travelling "to and fro" in the land of Political Economy since 1.January 1994, and this thesis is the account of my travels. For obvious reasons, I will not name those whom I met during these years who fall into the first two categories. For helping me to stake out the course at various points during my expedition, I would like to thank my two supervisors, Karl Rolf Pedersen and Gaute Torsvik. They have shared the main responsibility about equally, starting with the former and ending with the latter. Both have been on my committee all along, and have always been willing to read drafts of my travel accounts or discuss ideas of where to head next. I am also grateful to the third man on the committee, Kalle Moene, who has definitely not been the odd man out.

While a group of able and willing persons charged with the formal responsibility of managing your expedition is indispensable to the inexperienced traveller, you also benefit a lot from having friends and colleagues with whom you can share your stories around the campfire at the base camp, discuss your plans for future trips, and relax ahead of your next journey. My base camp has been the Department of Economics at the Norwegian School of Economics and Business Administration (NHH). I am thankful for having had the good fortune of sharing the company of Kjetil Bjorvatn, Lars Håkonsen, and Bertil Tungodden, among others too numerous to mention, during these five years. Torid Elvebakk has comforted many weary travellers, including me, by making the base a good place to rest, and has always been ready to help in solving practical problems encountered along the way.

Speaking of practical problems, there seems to be some kind of law ensuring that the number and severity of such problems increase at critical stages of your journey. In trying to wrap things up in a faraway land, I have had to struggle with both missing files and a computer that finally made good on its threat to break down. I was helped out of my predicament by Afsaneh Bjorvatn, to which I am grateful for supplying me with both the draft files for chapters two to five and background material for chapter one.

One of the highlights of my travels was the memorable year I spent at the Department of Economics, Boston University during 1995. For making my stay possible, I would like to thank Professors Erling Steigum of the Department of Economics, NHH and Larry Kotlikoff of the Department of Economics, Boston University. I would also like to thank Ellen Vollebæk of the Norwegian Research Council for helping me tackle the numerous practicalities that must be dealt with in such cases.

Travelling far and wide does not come cheaply these days. My journeys have been sponsored by the Norwegian Research Council, the Bank of Norway, and NHH. I appreciate their support.

Even though I enjoy travelling, there is still no place like home. For their support, going way back before the travels accounted for here, and for being who they are, I am indebted beyond possibility of repayment to my mother and Trygve. Having completed the mission I set out to accomplish, I plan to spend a lot more time with them, my friends, and my beloved Hilde, whom I met during these years of travelling (but that is another story).

Dar-es-Salaam

October 1999

Rune Jansen Hagen

Chapter 1

Political Economy and Economic Growth
An Introductory Exposition*

October 11, 1999

Abstract

Public sector institutions constitute the structure whereby demands for public policies are reflected in the supply of such policies. In this way, as well as by structuring activity in the private sector, such institutions contribute to determining the rate of economic growth. In the main part of this introductory chapter, I review the theoretical and empirical literature on the links between economic policies, political and bureaucratic institutions, and economic growth. Since economic growth seems a necessary but not sufficient condition for economic development, it is essential to develop an understanding of both how policies are shaped by specific institutional structures and how these structures are formed. In the last part of the chapter, I summarise how the substantive chapters of the thesis contribute to this research project.

"What development economics lacks is an adequate theory of government policy." (Fishlow 1991, p.1736)

1 Introductory Remarks

Public sector institutions constitute the structure whereby demands for public policies are reflected in the supply of such policies. In this way, as well as by structuring activity in the private sector, such institutions contribute to determining the rate of economic growth. In the main part of this introductory chapter, I sketch the most important theoretical and empirical results on the links between economic policies, political and bureaucratic institutions, and growth. Presently, public policies and institutions are considered major determinants of economic growth. Since in practice increasing average income seems a necessary but not sufficient condition for economic development, it is essential

*I could not have written this chapter without the help of Afsaneh Bjorvatn, to whom I am extremely grateful for providing me with the necessary material. I have also benefited from, and thus appreciate, the penetrating criticisms and helpful suggestions of Kjetil Bjorvatn, Hans Hvide, Hilde Selbervik, and Bertil Tungodden. Of course, none of these valuable aides can be held responsible for what I have produced on the basis of their support.

to develop an understanding of both how policies are shaped by specific institutional structures and how these structures are formed. The citation above, taken from a review of *Handbook of Development Economics*, attests to the importance of this research project. In the last part of the chapter, I summarise how the substantive chapters of my thesis contribute to it. Readers familiar with the subject of the next section might therefore want to proceed directly to section 1.3.

I start by outlining the main features of the world distribution of income as well as how different countries have fared in the four decades since the great wave of decolonalisation and the onset of economic assistance to what was euphemistically termed the developing countries. It appears that the great disparities between rich and poor countries are rather persistent, and might even be widening. Many countries have seen little or no progress since 1960. Worse still, countries like Somalia, Liberia, and Sierra Leone seem to be moving in the wrong direction. That is, they are not in the process of becoming the rich modern societies that were envisaged at the time, but are rather spiralling into greater poverty and social anarchy.

On the other hand, there are some examples of significant material improvement, most notably in Eastern Asia. Modern theories of economic growth emphasise the important role of economic policies, and not incidentally the so-called East Asian Tigers have been praised for their good economic policies (at least until recently). However, answering the question "Why do some countries grow faster than others?" with "superior economic policies" only begs the question "Why do some countries adopt superior economic policies?" Conventional economic theory cannot answer this question.[1] It has only a normative theory of economic policy, probably because the study of economic policy choice has been seen as beyond the borders of the discipline. However, there is now a rapidly developing field of (new) political economy straddling the border of economics and political science. Its tools are mathematics and game theory, allowing the subject matter to be studied at the same level of rigour which has been applied to "traditional" economic subjects.[2]

The substantive chapters of my thesis belong to this line of work. Three of them deal with various stages of the economic policy process. As noted above, economic policies are initiated, chosen, and implemented within an institutional framework which guides the process. Thus, almost by definition one should expect countries with "superior" public sector institutions to adopt "superior" economic policies. In the fourth substantive chapter, I ponder the question lurking behind this answer to the question "Why do some countries adopt superior economic policies?" That is, I make an effort at understanding the forces shaping the institutional framework. As all of these chapters are of a theoretical nature, it seems appropriate to devote some space here to the economic realities and previous theoretical work which in combination have motivated my choice of subject - *the political economy of economic policies and public sector*

[1] Of course, the public choice school has been developing such a theory for many decades.

[2] See Persson and Tabellini (1990) for a general account of the methodological approach of political economy.

institutions in developing countries.

2 Economic Growth, Economic Policies, and Public Sector Institutions[3]

2.1 The State of Our Disunion

The greatest challenge facing economic theory is to explain why some countries are poor while others are rich. The gap between rich and poor countries is immense. In a sample of one hundred and four countries, the ratio of the per capita income of the richest country to that of the poorest was never below 30 in 1960, 1970, and 1980, rising to as high as 45.24 in 1990.[4] That is, in 1990, average income in the richest country (USA) was 4424% higher than in the poorest country (Chad).[5]

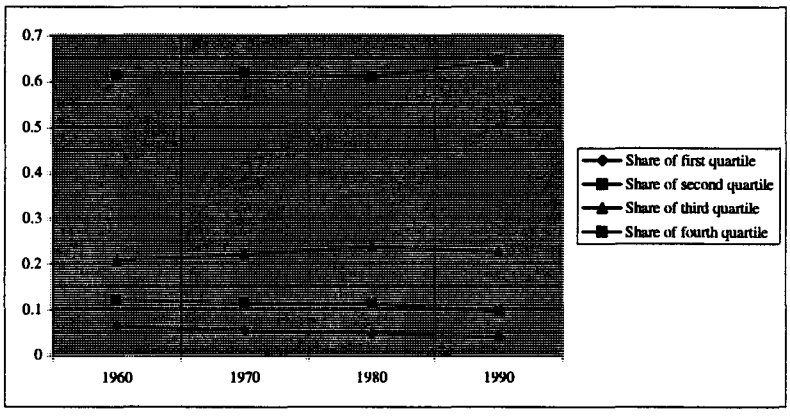

Figure 1: cross-country income shares 1960-90

This great inequality of income extends to the level of quartiles (figure 1). In 1990, the share of the fourth quartile of this sample in total income (the richest twenty-six countries) was almost 65%, while the share of the first quartile was well below 5%. In fact, during the thirty years since 1960, the upper half of the sample arranged by income has increased its share at the expense of the poorest half, the cumulative share of which declined from about 18.3% to 13.1%. Granted, the group of countries making up the lower tail of the cross-country income distribution in 1960 was not identical to the corresponding group in 1990. But the grouping was still remarkably stable, with nineteen out of twenty-six

[3] Some of the passages in this section are translations of material from Hagen and Pedersen (1999) and Hagen (1999).

[4] The data are taken from Easterly (1997). The income measure is real GDP per capita in constant 1985-dollars (the Penn World Tables Mark 5 is the primary source).

[5] In each of these years, the USA was the richest country. Chad shares the dubious status of being the poorest country with the fellow African states of Lesotho (1960), Burundi (1970), and Burkina Faso (1980).

members being the same. Moreover, this stability extends to the sample as a whole. Table 1 contains Spearman's rank correlation coefficient between country income rankings (poorest to richest country) in 1960, 1970, 1980, and 1980. A value of the coefficient of unity means that the two rankings being compared are identical. As the coefficients for consecutive years are in the region of 0.96-0.98, it is evident from table 1 that there is very little change in the ranking of countries from decade to decade. Even on a thirty year basis, the coefficient is as high as 0.89.

Table 1: Spearman's rank correlation coefficients across decades

	1960	1970	1980	1990
1960	1.0000			
1970	0.9793	1.0000		
1980	0.9387	0.9641	1.0000	
1990	0.8930	0.9314	0.9777	1.0000

In sum, there are great cross-country inequalities of income which seem to be increasing rather than decreasing. One might argue that a persistent (in ranks) or worsening (in levels) cross-country income distribution is nothing to worry about if every country is experiencing growth in income. However, this is not the case in the current sample. Even though the average income in the sample more than doubled from 1960 to 1990, not only did countries not share evenly in this growth, twelve of them (more than 10% of the sample) actually saw their per capita income decrease in this period (c.f. figure 2).

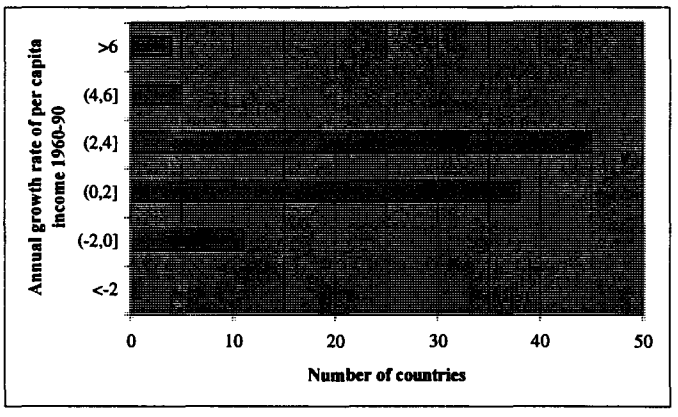

Figure 2: frequencies of growth rates 1960-90

Note: the average annual growth rates g have been calculated by the author from the data in Easterly (1997) based on the formula $GDPPC1990=(1+g)^{30}GDPPC1960$, where GDPPC1960 (GDPPC1990) is GDP per capita in 1960 (1990).

2.2 Catching Up And Falling Behind: On Miracles and Tragedies

The picture just painted is disappointing not only from an egalitarian perspective. About four decades have now passed since the hopeful term "developing countries" was coined. The optimism of the early years was not unfounded. On the contrary, both theory and facts seemed to indicate that rapid development was possible. The experience of the European countries (as well as Japan) in the aftermath of the Second World War, where the funding provided by the Marshall plan had resurrected their economies in about a decade seemed to point to the investment of capital as the decisive factor. This was corroborated by the (in)famous Harrod-Domar model, which held that income was a function of the capital stock only.[6] Hence, poor countries were poor because they had little capital. Moreover, being poor, there was little to save and invest. That is, there was a gap between the savings these countries could generate on their own and what was required for them to develop economically. Thus, foreign assistance was required, and would translate into immediate gains in living standards. As experience was gained, more gaps were added to the model, notably a foreign exchange gap and a public revenue gap, both of which seemed to reinforce the case for foreign aid to developing country governments.

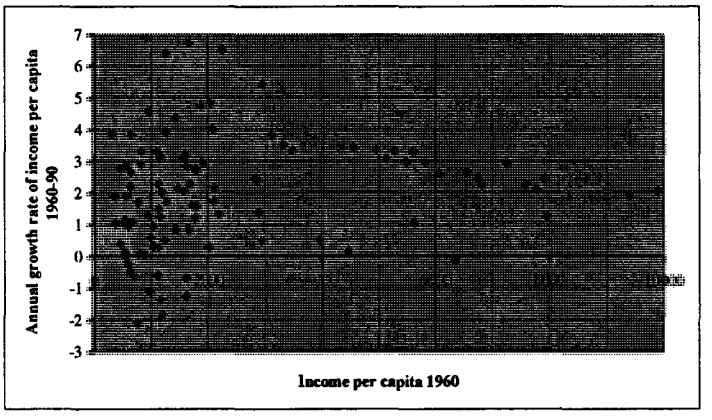

Figure 3: absence of absolute convergence

Note: The sample is the same as in figure 2. See the note to that figure for details.

However, even though the Harrod-Domar model is simplistic in the extreme, more sophisticated models also seemed to give cause for optimism. For example, another early model of economic growth, the Solow-model, predicts that if two countries are identical in every respect except for their income level, the poorest of these should grow faster than the richest on the way to their common steady-state. That is, if the assumptions of the model hold true and other things are

[6] In fact, it is not much of a model, being based on the identity $Y \equiv cK$, where $c = Y/K$, output per unit of capital, is assumed to be constant. Thus, manipulating the level of capital employed makes it possible to generate any level of output.

equal, poor countries should eventually catch up with rich.[7]

Though, by now the prediction of *absolute convergence* has been soundly refuted by the evidence. Figure 3 demonstrates this based on the countries in the current sample. If there was something to the notion of absolute convergence, the pairs of data on initial income and subsequent growth should have been scattered more or less along a line falling from the north-west to the south-east. No such pattern can be detected. Moreover, eleven out of the twelve countries with a negative average growth rate from 1960 to 1990 were countries with income below the sample average in 1960.

Figure 3 also illustrates that countries with similar economic starting positions have fared rather differently over the period covered. This can be exemplified by comparing the recent economic histories of Ghana and South Korea. Ghana was the first colony in Sub-Saharan Africa to become independent (in 1957). Under the leadership of the charismatic Kwame Nkrumah, the country symbolised the bright future of the countries on the continent. In 1960, GDP per capita stood at 894 1985-dollars. In the same year, the corresponding figure for South Korea was about the same (at 904). Its economic prospects did not seem as bright as Ghana's. On the contrary, suffering from a highly corrupt and inefficient regime and facing the threat from the communistic North, the country seemed destined for stagnation. That fate, however, befell Ghana instead. Thirty years on, having experienced practically no growth at all, it was still a low-income country. On the other hand, South Korea was approaching status as a high-income country (something which it has later achieved, together with membership of the OECD). This was the result of a phenomenal six-fold increase in the level of income.

Table 2: Highest and lowest average annual growth rates 1960-90

Fastest growth		Slowest growth	
Country	Growth rate (%)	Country	Growth rate (%)
South Korea	6.9	Chad	-2.1
Singapore	6.7	Madagascar	-1.9
Hong Kong	6.5	Mozambique	-1.4
Taiwan	6.4	Guyana	-1.3
Japan	5.4	Zambia	-1.1
Cyprus	4.8	Nicaragua	-0.7
Portugal	4.7	Central African Rep.	-0.6
Thailand	4.5	Benin	-0.6
Malaysia	4.4	Burundi	-0.5
Greece	4.0	Uganda	-0.3

As illustrated in table 2, the cases of Ghana and South Korea are actually fairly representative of the difference between the growth record of countries in East and Southeast Asia and those in Sub-Saharan Africa.[8] Of the ten fastest

[7] Of course, other things - i.e., other parameters of the model such as the level of technology and its growth rate and discount and savings rates - need not be (and are not) equal in poor and rich countries.

[8] It is easy to find other examples of countries in these two regions starting at about the

growing countries in my sample, seven are old and new "tiger" economies (the rest are from Southern Europe). This is the so-called East Asian "miracle".[9] Of the ten slowest growing economies, eight are from Sub-Saharan Africa. This phenomenon has been dubbed "Africa's growth tragedy" (Easterly and Levine 1997).

2.3 Economic Policies and Economic Growth

So far we have seen that there are income differentials between countries that seem rather persistent on average, but that some countries have managed to bridge the gap and thus improve their lot. The latter is important because at first sight the answer to the question "Why?" seems simple enough: rich countries are rich because they are in possession of the prerequisites for creating wealth, such as advanced technology, machines, and a highly educated labour force. However, on closer inspection this answer is incomplete. The level of technology, the number of machines, and the quality of a country's labour force are not determined by nature. Moreover, being richly endowed with natural resources is not a necessary condition for becoming a high-income country. If it were, Japan would never have achieved such a status. It is not sufficient either, because then Nigeria would be one of the richest countries in the world and not one of the poorest, which is in fact the case.[10] The million dollar question is therefore why some countries experience resource accumulation and technological progress while others get stuck in technological backwaters without getting more of neither human nor physical capital?

The intuition behind the convergence result of the Solow-model is the following. Poor countries have less physical capital than rich countries. Thus, if the marginal product of capital is decreasing, the returns to investment should be lower in rich countries than in poor. One reason why the marginal product of capital might be decreasing in the aggregate is that it seems reasonable to expect that the best investment opportunities are exploited first. Subsequent investment will therefore be in projects with lower and lower returns. If the set of possible projects is the same in all countries, poor countries should therefore

same level of income in 1960 but finding themselves worlds apart by 1990. Zambians were actually richer on average than the Thais in 1960 (965 versus 943). But while income per capita declined by about 1.1% annually in the former during 1960-90, it grew at 4.5% in the latter. Therefore, in 1990 the average Thai had more than five times the income of the average Zambian. The people of Madagascar fared even worse than the Zambians, losing almost half of their per capita income from 1960 to 1990. The Taiwanese, on the other hand, who were only about 5% richer on average in 1960, had a level of per capita income in 1990 which was a whopping 1095% above their fellow islanders.

[9] For general surveys of the recent economic history of the East Asian "miracle" countries, see e.g. Campos and Root (1996) and World Bank (1993). The case studies of Amsden (1989) and Wade (1990) provide less euphorial and more in-depth descriptions of South-Korea and Taiwan.

[10] Another interesting (if depressing) example is Venezuela, also one of the most important oil-producers in the world. However, out of the twelve countries in my sample with negative average growth rates 1960-90, Venezuela is the only one which had a level of income above the sample average in 1960.

see more investment and thus higher growth than rich countries.[11]

Of course, being poor countries with small capital stocks will not be able to save much (in absolute terms). One way in which the potential growth differential between capital-rich and capital-poor economies might be realised is then through capital flows from the former to the latter. Such flows might be private or public and might come in the form of investments, loans, or grants. While the conditions attached to the transfer will differ between the various types of international capital flows, if invested efficiently (as assumed in the Solow-model) all of them can contribute to increased economic growth on the way to the long-run "equilibrium" state of the economy.

The importance of the investment rate for economic growth has been corroborated by empirical evidence.[12] It is therefore somewhat paradoxical that in the steady-state of the Solow-model, economic growth is constant and determined by the rate of technical progress, which is exogenous. In other words, this is a theory of long-run growth which does not explain long-run growth! Note in particular that this means that economic policies do not affect the growth rate of the economy.[13] This feature would probably puzzle any layman, and as the 1970s unfolded, many development economists became convinced that policies do indeed matter for economic growth. In particular, the path of state-led development that had been followed by many low-income countries in Latin America, Africa, and Asia, came increasingly to be viewed as an obstacle to progress. With the rallying cry of "get prices right", these economists mounted an increasingly aggressive attack on quotas, multiple exchange rates, state-owned enterprises, and other symbols of societies with a high degree of state involvement in economic affairs. Eventually, these views came to dominate the agenda of the development community, and the 1980s ushered in structural adjustment programs supported by the multilateral financial institutions and bilateral donors.

While the record of structural adjustment programmes is rather disappointing to date, the belief that economic policies matter for economic growth has been bolstered by modern theories of growth in which the rate of resource accumulation is endogenous, that is, explained within the model.[14] The essence of economic growth is accumulation of resources (broadly defined) across time. Accumulation necessitates abstaining from consuming resources today so as to be able to have greater consumption tomorrow. The returns to postponing consumption are therefore crucial for savings and investment. Two major categories of determinants of the returns to accumulation arising from this literature are 1) differences in institutions across countries and 2) differences in economic policies.

[11] This if is of course just as brave as the ones noted in the last sub-section.

[12] For example, Levine and Renelt (1992) find that the share of investment in GDP is the only robust (in a certain statistical sense) explanatory variable in cross-country growth regressions.

[13] Economic policies might affect the growth rate of the economy along the transition path to the steady-state. Since the speed of transition might be low, policies could have an impact for a long time even in the environment assumed in this model.

[14] Many of these theories focus on investment in human capital. For the issues explored here, though, it seems more relevant to concentrate on investment in physical capital.

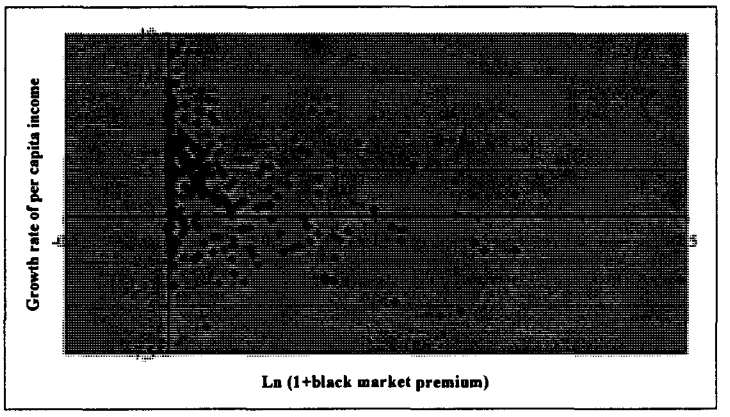

Figure 4: growth as function of black market premia

Note: each data point is a combination of the average annual growth rate of per capita income (calculated by the author using the income data in Easterly 1997) and the natural logarithm of one plus the black market premium (taken from Easterly and Levine 1997). Both numbers are decade averages. The figure is based on the maximum number of such observations that I could assemble from my sources.

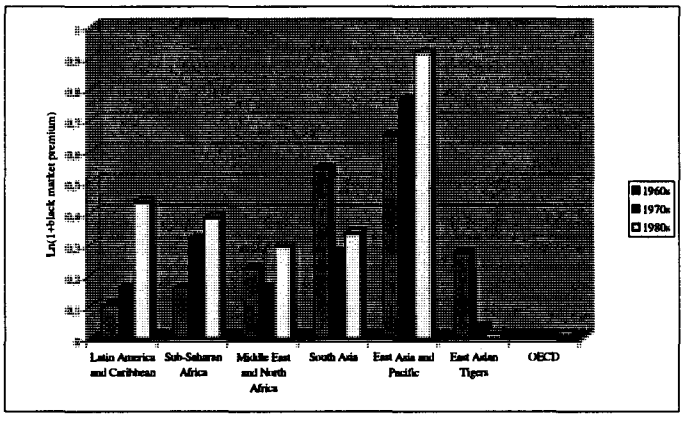

Figure 5: regional decade averages of black market premia

Note: the figure is based on 103 countries for which data were available from Easterly and Levine (1997) for all three decades. There are 32 countries from Sub-Saharan Africa, 23 OECD-countries (excl. Turkey), 20 from Latin America and Caribbean, 10 from the Middle East and North Africa (incl. Turkey), 5 from South Asia, 6 from East Asia and Pacific (excl. the Tigers), and 7 Tigers (Hong Kong, Indonesia, Malaysia, Singapore, South-Korea, Taiwan, and Thailand).

Starting with the latter, it is common to point out the differences between the policies pursued by the East Asian Tigers and most other developing countries. For example, a premium on foreign exchange in the black market (or equivalently, the existence of such a market) can be regarded as a reflection of distortionary macroeconomic policies. Indeed, as figure 4 demonstrates, average

annual growth rates of per capita income over decades are a negative function of the average decade black market premium.[15]

Since policies differ markedly between regions (as exemplified in figure 5), this might explain why some countries grow faster than others. In particular, since the East Asian Tigers seem to have followed much less distortionary macroeconomic policies than other developing countries, this might explain how miracles are made.

As economic policies are partly determined by political processes (they are also shaped by bureaucratic processes), there is clearly a need for studying these if one are to understand either cross-country variability in economic policies or shifts within a country over time. In the last decade, there has been a lot of research on the impact of political polarisation and political instability on economic policies.

Political instability can take two different forms. First of all, governments might change. Such changes can proceed according to pre-established rules, e.g. after elections or votes of confidence in the legislature. However, they can also occur by unconstitutional means such as coups and revolutions. The second type of political instability is exemplified by socio-political events such as strikes, demonstrations, riots, and political violence.[16]

Note well that it is potential instability which is important for economic decisions with long-term consequences. In the process of making up their minds about what to do, agents will try to forecast the development of decision-relevant variables. For example, a private investor evaluating whether to establish a factory with a physical life-span of twenty years will try to forecast what the prices of the products produced in the factory and government policy on issues like profit taxation and infrastructure development will be during that period. Once the capital has been committed, the decision is normally not fully reversible, i.e., it is not possible to recapture the full value of the investment if the investor decides to close down the factory. Therefore, changes in government policies affecting the profitability of the venture cannot change the investment decision once it is made (it might of course change the profitability of continuing production). However, the possibility of such changes might affect the original decision on whether to build the factory.

Political polarisation is caused by differences between individuals or groups in a society in terms of for example income, ethnicity, religion, culture, or ideology. Since there are no societies which are completely homogenous in every respect, polarisation (like instability) is a matter of degree. For our purposes, what is important is that political polarisation implies that there is disagreement over what economic policies should be pursued. It is to be expected that the greater the degree of polarisation, the greater is the disagreement over policies. This means that one should expect both the differences in the economic policies of potential future governments and the opposition of those out of power to the

[15] A simple regression of growth rates on ln (1+black market premium) yields GRWTH = 2,6-2,8BLCKMKT. The t-statistic of the slope coefficient is a healthy 6,9 and R^2=0,13.

[16] Of course, these two types of political instability might occur simultaneously, and this is in fact common in practice.

policies of the current government to be increasing in the degree of polarisation.

The societies of poor countries tend to be more polarised politically than those of rich countries. One possible reason for this difference is that income and wealth is distributed much more unequally in the former type of countries. Table 3 illustrates this. It is based on all the countries (thirty-nine) in the dataset of Easterly (1997) for which decade averages of the Gini-coefficient were available for the four decades shown. For each decade, I have ranked the countries according to the degree of income inequality. It can be seen that no developing country appear among the three countries with the most egalitarian income distributions in any decade. On the other hand, the three countries with the most unequal income distributions are always developing countries. In fact, they are always from Latin America or Sub-Saharan Africa, with Kenya being consistently among the top three.

Table 3: Highest and lowest values of Gini-coefficients

	Most egalitarian	Least egalitarian
1960s	1. Bulgaria 21.46	1. Jamaica 62.80
	2. Czechoslovakia 22.15	2. Kenya 62.55
	3. Hungary 24.25	3. Peru 61.83
1970a	1. Bulgaria 20.34	1. Ecuador 65.38
	2. Czechoslovakia 20.88	2. Kenya 63.60
	3. Hungary 22.17	3. Peru 57.14
1980s	1. Czechoslovakia 20.63	1. Kenya 57.30
	2. Hungary 22.47	2. Chile 54.61
	3. Bulgaria 23.20	3. Mexico 52.45
1990s	1. Finland 23.55	1. South Africa 62.30
	2. Czechoslovakia 24.56	2. Kenya 54.39
	3. Germany 26.00	3. Chile 52.35

Note: the primary source is Deiniger and Squire (1996).

Recent empirical studies have found initial inequality (i.e., at the start of the period covered) to be negatively associated with subsequent rates of growth. These econometric studies are supported by case-studies (e.g. Birdsall, Ross, and Sabot 1995) claiming that one of the important reasons why East Asian countries such as South Korea and Taiwan have been able to prosper is that income and wealth have been much more equally distributed there than in many Latin American and Sub-Saharan countries. There are of course many different ways in which inequality might have a negative impact on accumulation.[17] However, it seems reasonable to assume that one of the most important channels is through increased polarisation with a concomitant increase in political instability. This is what Alesina and Perotti (1996) find, for example. More specifically, they find that income inequality tends to increase "socio-political instability" (as measured by indicators of political violence and government instability (coups)). In turn, this sort of instability reduces aggregate investment

[17] On theories and evidence on the various possible channels from inequality to growth, see e.g. Alesina and Rodrik (1994), Clarke (1995), Deiniger and Squire (1998), Perotti (1996), and Persson and Tabellini (1994). An excellent review is provided by Benabou (1996).

in their data set.

It is important to note that when speaking of the consequences of potential instability, the degree of polarisation is crucial. First of all, there are several models which predict that potential instability changes politicians' evaluation of public finances over time. The reason is that when policy-motivated politicians might be replaced by political opponents with different views on public spending, the only sure thing is that they determine how public funds are spent today. Since from their point of view their own stance on spending is superior to those of their adversaries, the value of having resources available in the future changes, the more so the greater the polarisation between the current and potential future governments. The result might be highly inefficient policies.[18] Indeed, several empirical studies show that political instability leads to higher public sector deficits and debts and higher rates of inflation.[19]

Secondly, if there is no polarisation, the uncertainty about future policies engendered by the potential for instability is more apparent than real - if all politicians are the same they will presumably pursue the same policies. Hence the negative impact of instability on private investment is likely to be negligible. On the other hand, the greater the political differences between potential future governments, the greater the potential policy volatility. This is likely to reduce irreversible investments in physical capital as investors postpone their decisions to "wait and see" what the outcome will be or move capital abroad to countries which are considered to be more stable. In fact, econometric analyses such as those of Fischer (1993) and Brunetti (1998) demonstrate that indicators of macroeconomic instability (e.g. high and variable inflation) tend to have a negative impact on economic growth.

As noted above, one way in which the growth potential of poor countries might be unleashed is through capital flows from the capital-rich economies. However, private capital has often been flowing in the opposite direction, that is, from the presumably high-returns-to-investment economies to those which presumably are low-returns-to-investment.[20] In addition, those developing countries which presently receive private foreign investment tend to be middle-income countries, which by the logic behind the convergence result should have lower returns to investment than low-income countries (once again, other things being equal). Political risk - or, more generally, policy risk - is probably the single most important reason why capital is not consistently flowing into poor countries with untapped investment possibilities.[21] Moreover, it is also a major reason why the funds that have been forthcoming in recent years have tended to be portfolio investment and not investment in fixed capital. The latter, which is necessarily of a long-term character, is much more vulnerable with respect to sudden changes in policy than the former, which is "hot" money, i.e., can be

[18] Consult the survey in section 2 of chapter 3 for references.

[19] See the survey in chapter 4 of Hagen (1994).

[20] Lucas (1990) speculate on the reasons for this apparent paradox. Tornell and Velasco (1992) provide a possible political economy explanation.

[21] It can also explain phenomena such as private outflows of capital occurring simultaneously with public borrowing abroad (c.f. Alesina and Tabellini 1989).

withdrawn at the suspicion of adverse developments in the rate of return (or indeed merely better prospects elsewhere). Capital-importing countries, on the other hand, are much more vulnerable if they are overly dependent on short-term capital flows, a point which the financial crises of this decade (Mexico, East Asia) have driven home with a vengeance.

Thirdly, it seems reasonable to assume that socio-political instability is likely to occur more often and be of a more serious character in highly polarised societies. Strikes clearly reduce the productivity of workers; riots and political violence might cause harm to employees or damage equipment; and demonstrations or blockades can prevent raw materials from being imported or finished products from finding their way to the markets. Events such these can therefore seriously erode the profitability of investment, and the uncertainty surrounding their occurrence will contribute to making profits seem more variable ex ante. This is likely to reduce private investment. The study by Alesina and Perotti (1996) cited above seems to confirm this presumption.

As an illustration of the magnitude of the effects of polarisation and instability on economic growth, consider table 4 which is adapted from table 2 of Alesina, Özler, Roubini, and Swagel (1997). Each cell contains the average growth rate of GDP per capita in one of six different groups of countries in years of specific types of government changes. First of all, it is noteworthy that the average growth rate is lower in years of government change than in years without such changes for all groups (compare columns one and two). On average, the growth rate in years where the government does not change is almost twice the rate in years where such changes take place.

Table 4: Government instability and economic growth 1960-82

	No change in gov't	Gov't changes	Insignificant gov't changes	Significant gov't changes	Coups
All countries	2.8	1.5	2.3	0.2	-1.4
Latin Amer.	2.4	1.5	2.9	0.2	-0.6
Africa	2.0	-0.4	1.1	-1.9	-2.6
Asia	4.0	1.7	1.9	1.2	1.0
Ind. countr.	2.9	2.8	3.0	2.3	-
Others	5.3	2.0	2.5	1.4	-2.2

Note: See the source for data definitions. The country classification of the IMF is used. "Others" are non-industrial European countries. There are no instances of coups in industrialised countries in the sample period.

Secondly, significant government changes have a much greater negative impact on growth than insignificant ones. A change is deemed to be significant by the authors if i) it takes place by irregular procedures (such as coups) or ii) if pre-established rules are followed but there is a considerable change in the government's political affiliation. Hence this category is created to try to capture the effects of polarisation, and demonstrate that the negative effects of political instability are much stronger when coupled with polarisation. In fact, in Africa per capita GDP declined by almost 2% on average in years of significant changes in government while the corresponding numbers in years with

insignificant changes and no changes were increases of 1.1% and 2% respectively. One reason why Africa does so poorly is that on several accounts polarisation seems to be more severe in these countries, at least in Sub-Saharan Africa. In connection with table 3, I noted that Kenya was among the three countries with the most unequal income distributions in all decades. However, that table was based solely on countries for which data were available for all four periods were included. This severely restricted the number of African countries covered. If we look at the 1980s only, which is the period for which I have the most observations (eighty-three), four of the five countries with the highest decade averages of the Gini-coefficient are from Sub-Saharan Africa.[22]

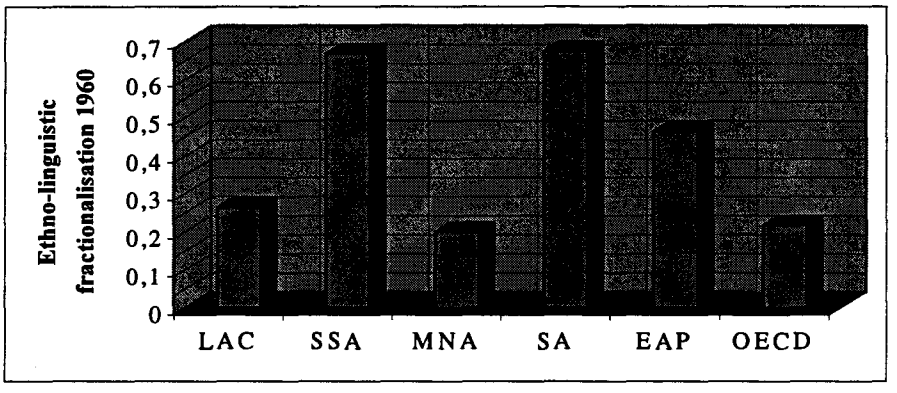

Figure 6: regional averages of ethno-linguistic heterogeneity 1960

Note: the data, taken from Easterly and Levine (1997), covers 110 countries. Consult this paper for details of the primary source. The indicator measures the probability that two randomly chosen individuals in a country do not belong to the same ethno-linguistic group.

Moreover, Sub-Saharan has one of the most fragmented population structures of all the regions of the world, c.f. figure 6. The horrifying human consequences of ethnic strife have been all too clear in recent years as countries such as Somalia, Liberia, and Sierra Leone have disintegrated into anarchy and Rwanda has experienced genocide. But even in times and places less dramatic than these, the artificial borders bequeathed by the colonial powers seem to have contributed to making African politics a zero-sum game between various redistributive coalitions based on ethnicity. The negative economic consequences have been documented by Easterly and Levine (1997), who show that the ethno-linguistic fragmentation of Sub-Saharan Africa contributes both directly and indirectly (through e.g. more inefficient policies and more corruption) to the well-known abysmal recent growth record of these countries. It might be added that the ethnic homogeneity of some of the East Asian Tigers could well be a factor that has contributed to their relative political stability and, thereby, to their economic success.[23]

[22] Lesotho is on top (or bottom, depending on how you see it) with a Gini-coefficient of 60. Malawi is in third place, Kenya is number four, and Botswana is in fifth place.

[23] It is noteworthy that fourteen of the fifteen most heterogeneous countries in my sample

2.4 Public Sector Institutions and Economic Growth

Institutions are laws, rules, and norms that govern human behaviour or clusters of such regulative features of society. They might be informal, such as customs, or formal, examples of which are statutory laws. Many formal institutions are established through political decision-making while informal institutions do not come about through explicit action at a point in time. Formal and informal institutions usually interplay. Such interplay is found in the market place, for instance, where formal property rights, customs, and expectations based on common norms of behaviour are all shaping the behaviour of individuals and the consequences of these.

There has been some interest recently in using cross-country differences in informal institutions to explain differences in growth.[24] Here I shall concentrate on formal institutions, since these are amenable to purposive choice. Furthermore, formal institutions are not only shaping behaviour in the economic arena. In particular, public sector institutions structure the process by which economic policies are formed. Political institutions mediate pressures from various social groups and turn them into policy choices. In turn, bureaucratic institutions shape the manner in which policy choices are actually implemented. In sum, the economic policies pursued in a country are determined in a multi-staged process of initiation (or agenda-setting), choice, and implementation. At each stage of the process, public sector institutions are crucial.

The genesis of this uplifting hypothesis - that all good things go together - was of course the experience of the industrialised countries. However, the conclusions of the modernisation school were soon challenged both theoretically and empirically. Many African countries which had adopted democratic institutions at independence switched to more autocratic political regimes even though overall African economies were not doing too badly in the 1960s.[25] Moreover, autocracies such as South-Korea, Taiwan, and Brazil experienced rapid growth based on manufacturing and were thus modernising their economies without experiencing democratisation. Both economists and political scientists proposed theories of why democracy was at odds with economic development. They held that countries which sough rapid growth should postpone political development in the form of democratic rights and adopt a more autocratic political regime.[26]

The political regime of a country - the degree of democracy - is perceived by

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are from Sub-Saharan Africa. South Korea, on the other hand, is the only country in the sample which is completely homogenous, while Japan is the second most homogenous country and Hong Kong is the fifth.

[24] One example is Landes (1998), who sees culture as the main determinant of economic progress. Culture can be viewed as a set of commonly held beliefs and expectations which influence behaviour. Similarly, the literature on "social capital" (see e.g. Knack and Keefer 1997) purports to show that countries with more social capital grows faster.

[25] For example, of the 33 countries from Sub-Saharan Africa for which I was able to calculate the average yearly growth rate 1960-90, 25 grew more rapidly than this on average in the 1960s.

[26] A classic example is the book by Huntington (1969). For an account of the ups and downs in the standing of democracy in the development debate, see Sirowy and Inkeles (1991), who also reviews early empirical studies of the relationship between democracy, economic growth, and inequality.

many to be the most significant formal institutional characteristics of its society. One reason is of course that many people view democracy as an end in and of itself. However, the link between political regime and economic development is a long-standing and controversial issue as well. The proponents of the so-called modernisation school of political science, which had its heyday in the 1950s and 1960s, argued that the transformation of traditional societies involved more than urbanisation, industrialisation, and higher income levels. Modern societies were also democratic societies, they alleged, so the process of modernisation would lead to the establishment of democratic rights for the inhabitants of developing countries (who would acquire the attitudes and norms associated with life in a modern democratic society).

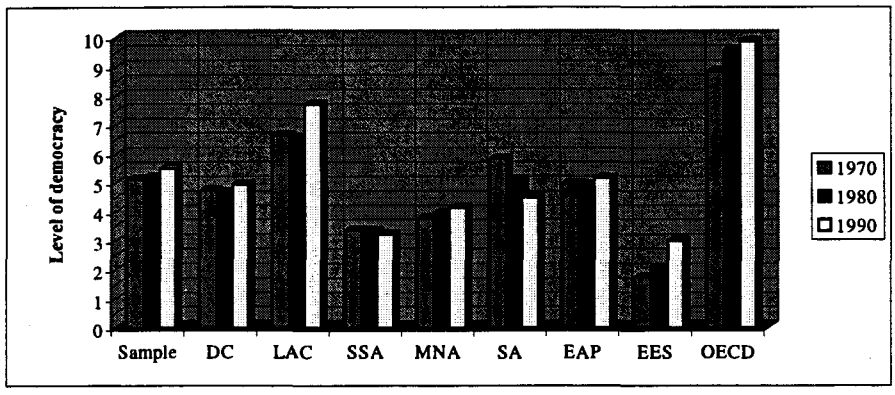

Figure 7: regional levels of democracy

Note: the data are taken from Easterly (1997). Only countries for which data could be obtained for all three years have been included. I have calculated the average of the two sub-measures of political and civil rights after converting them to a 1-10 scale. The acronyms stand for Latin America and Caribbean (LAC, 33 countries), Sub-Saharan Africa (SSA, 46 countries), Middle East and North Africa (MNA, 21 countries incl. Turkey, Malta, and Cyprus), South Asia (SA, 9 countries), East Asia and the Pacific (EAP, 23 countries), and Eastern Europe and the former Soviet Union (EES, 9 countries). DC is the average of the developing countries, i.e., all regions except EES and the OECD (23 countries).

For some reason the view that democracy is a prerequisite for economic growth seems to have become in vogue again. Perhaps it is due to the abysmal record of countries ruled by dictators such as former President Mobutu of Zaïre. Indeed, "good governance" is often held to imply the rule of law, accountability on the part of public officials, and participation in public affairs by citizens, features which are more reliably present under democratic regimes. Moreover, as shown in figure 7, the level of democracy varies widely between the regions of the world.[27] If political regime has an impact on economic development,

[27] Even though the debate is often couched in terms of the dichotomy autocratic-democratic, it should be clear that political regime is a continuous variable. Moreover, it is a multi-dimensional concept and any real world regime is likely to score differently along the various dimensions. Of course, measuring the degree of democracy involves a certain degree of subjectivity. Figure 7 is based on the most widely used measure of democratic rights, known as

this institutional feature is thus a potential answer to the question "Why are some countries rich and some poor?" But though democracy is currently even heralded as a sine qua none by some observers, alas neither theory nor facts support this optimistic conclusion. This is not the place to recount the numerous arguments pro and con a positive effect of democracy on economic growth.[28] Suffices to say that there are about as many cons as pros. Figure 8 neatly summarises the main conclusion of the empirical literature: there is no robust relationship between political regime and economic growth.[29][30]

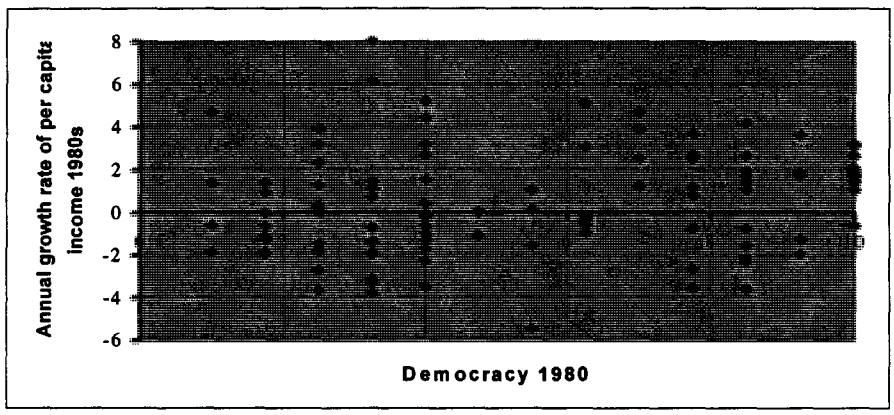

Figure 8: democracy and economic growth

Note: the figure is based on 109 observations on the average of Gastil's indices of political and civil rights (converted to a 1-10 scale) and the average annual growth rate of per capita income 1980-90. Both data series have been computed by the author based on the raw data in Easterly (1997).

While the overall institutional characteristic political regime is not systematically related to growth performance, more disaggregate features of public sector institutions are. Figure 9 shows a measure of "institutional quality". This measure is the simple average of five measures. Two of these might be said to reflect characteristics of political institutions (freedom from expropriation and repudiation of contracts by the government), two concerns the quality of administrative institutions (freedom from corruption and bureaucratic quality),

Gastil's index (see Gastil 1991). However, other measures tend to reasonably consistent with this measure. That is, their ordinal properties tend to be the same, which is the most that one can hope for given the subjective nature of the variable.

[28] An account is given in Hagen (1999).

[29] See Brunetti (1997) for a recent summary of empirical studies of the impact of political regime on growth.

[30] Even though the sources of political instability usually differs across regimes - for instance, in autocracies governments rarely change due to elections while in more democratic regimes this is rather common - no regime type is completely stable. This could be the reason why political regime is not a robust explanatory variable in growth regressions. The degree of instability might vary as much between countries with the same political regime as between regime types. This is not to say that political institutions do not have an impact on instability (and polarisation). For the sake of brevity, I do not elaborate on this issue here. See Hagen (1999) for an example of how electoral institutions might affect these political phenomena.

and one attempts to measure state of a country's judicial institutions (rule of law).[31] Obviously, all of these are subjective measures. However, they have been constructed by companies specialising in selling country risk assessments to commercial firms considering trading or investing abroad. The willingness of the latter to pay for the information indicates that it is perceived to be valuable, i.e., reflect important characteristics of the business environment in the countries analysed.

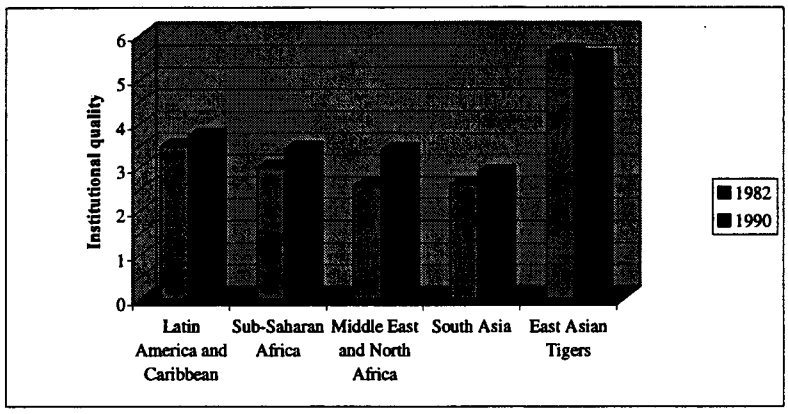

Figure 9: average regional institutional quality in 1982 and 1990

Note: the figure is based on 63 countries for which data (from Easterly 1997) were available for both points in time (1982 is the first year for which these measures are available). Of these, there were 22 countries from Latin America and Caribbean, 15 from Sub-Saharan Africa, 14 from the Middle East and North Africa, 7 Tigers, and 5 South Asian countries.

As can be seen from figure 9, in terms of institutional quality the Tigers are head and shoulders above other regions of what was formerly known as the Third World.[32] Many researchers have found that measures such as these are significant explanatory variables in growth regressions. For example, Knack (1996) and Keefer and Knack (1997) demonstrate that the ability of poor countries to catch up with the rich is affected by the quality of their public institutions. The econometric analysis of Mauro (1995) shows that growth is slower in countries with more corruption. Finally, Knack and Keefer (1995) find that investment and growth is higher in countries where property and contract rights are better protected.[33]

Table 5 illustrates the link between institutional quality and economic growth based on the countries in my sample. It contains simple regressions of average

[31] Knack and Keefer (1995) and Mauro (1995) contain descriptions of the definition of these measures.

[32] I have data for both years for only three OECD-countries, one (Turkey) of which I include in the Middle East and North Africa category, one Eastern European country, and two East Asian countries which are not Tigers. Therefore, these regions are not included in the figure 6.

[33] In addition, Hall and Jones (1996) find that differences in institutional quality explain some of the variation in production per worker between countries.

decade growth rates 1980-90 on various measures of institutions dating from the beginning of that decade. All of the coefficients are of the expected sign. That is, the regressions confirm that in countries where the risks of government expropriation of private property and repudiation of contracts are low, there is little corruption, the quality of the bureaucracy is high, and the rule of law is well established, the rate of economic growth is higher than in countries with the opposite characteristics. Not surprisingly, the summary measure of institutional quality tells the same story. Moreover, all of the coefficients are highly significant at conventional levels, and the R2s are quite satisfactory given the monocausal nature of the regressions.

Table 5: Institutions and Economic Growth

	Independent variable					
	REPUD	EXPROP	CORRUPT	BURQUAL	RULELAW	INQUAL
Const.	-4.3407	-3.4522	-1.7209	-2.0166	-1.6258	-3.3268
t-stat.	(3.7007)	(3.4750)	(2.4927)	(3.4305)	(2.7957)	(3.8848)
Coeff.	0.8548	0.6918	0.7430	0.9449	0.8100	0.9896
t-stat.	(4.0430)	(3.9097)	(3.2163)	(4.4914)	(3.8253)	(4.4506)
R^2	0.23	0.22	0.16	0.27	0.21	0.26

Note: the table reports the results of ordinary least square regressions of average yearly growth rates for the 1980s on each independent variable. The number of observations is 57.

2.5 International Lending, Foreign Aid, and Conditionality

If poor countries might grow faster if they adopt the right policies and institutions but are unable to establish them on their own, why do not the international community help them get their house in order? Well, it is certainly not for want of trying. The role of external financing with economic and institutional reforms in developing countries has been at the forefront of the policy debate for the last 15-20 years. While the IMF already had a long history of attaching conditions to its short-term loans for balance-of-payments support in order to safeguard its capital, it was in "the lost decade" of the 1980s that the international pressure for change really started to get to the governments of poor countries. This was the decade of the debt crisis, when many developing countries saw their ability to borrow on the world market severely restricted, real interest rates rose, and arrears on debt payments mounted.

Though, the economic difficulties were rarely of a purely external nature. Many developing countries had clearly followed unsustainable macroeconomic policies, while at the same time over-extending the role of the state. This was only reluctantly conceded by some of these governments, and other governments refused to mend their ways even in the face of external financing problems. The resulting economic crises, though, forced even some of the hard-liners to turn to the international financial institutions (IFIs) and bilateral donors as substitutes for the private funds that were no longer forthcoming. These actors, however, were generally of the opinion that reforming economic policies was necessary, and this opinion was bolstered as the decade proceeded, resulting in increasingly

insistent demands for reforms. Project-based funding was replaced by policy-based funding. The reluctance to reform on the part of some governments receiving public bilateral and multilateral funding resulted in a proliferation of conditions attached to both grants and loans.

One of the reasons why international lenders have been trying to coax and coerce borrowing countries into pursuing certain economic policies is that the debt crisis underlined the fact that it is very difficult to enforce repayment of foreign debts in general and sovereign debt in particular. Legal proceedings against defaulting private borrowers in developing countries are likely to be very costly, and there are no international courts in which one can seek redress for breach of contract if a government defaults on its foreign debt. If borrower countries can be made to implement policies that promote economic growth and sound public finances, the likelihood of both private and public debtors repaying their foreign debt will presumably increase. Moreover, the inhabitants of borrowing countries will also gain if these policies are successful.[34]

Recast in this perspective, the motives of the lender countries and the IFIs seem eminently defensible. When it comes to foreign aid though, it is easy to point to various donor motives that are likely to reduce the effect of the funds transferred. For example, commercial interests have lead to the widespread practice of tying aid to purchases of goods and services from the donor country. This reduces the value of the aid to the recipient since it is highly unlikely that untied aid would have been spent in the same way. Furthermore, many donors have been allocating their aid according to strategic interests.[35] Although this was perhaps an even greater problem during the cold war, the practice is still evident in e.g. the French bias towards its former colonies. Clearly, if foreign assistance is given to prop up friendly regimes, any positive effects on economic growth would be merely coincidental.

However, even altruistic donors face problems in trying to promote economic development in poor recipient countries. Though in principle their aid is given to enable the recipients to fend for themselves one day, their focus on income levels serves to undermine this goal. The reason is that aid conditioned on income works like a tax on efforts made by the recipients to increase their income - the richer they get the less aid they will receive. The result is aid dependency. This is the so-called *Samaritan's Dilemma*.[36]

On the other side of the relationship it is clear that many countries do not have well-meaning authorities or well-functioning political and bureaucratic systems. Phenomena such as corruption and elites which misappropriate aid by diverting funds to their own overseas bank accounts while the majority of the population lives in poverty attest to this. To counteract such shortcomings on

[34] This is not to say that these policies are entirely uncontroversial. However, even though Williamson (1994) seems to be exaggerating a bit when using the word "consensus" to describe the policies promoted by the IFIs, there is a fairly broad agreement among economists on what policies will foster economic growth.

[35] Alesina and Dollar (1998) provide an empirical analysis of the motives of various bilateral donors.

[36] References to the literature on the "Samaritan's Dilemma" are given in chapter 4.

the part of the recipient, one might think that donors could ear-mark their funds for specific purposes. However, aid seems to be *fungible* to a large extent. That is, recipients are often able to divert funds from ear-marked activities to other projects and programs. Thus, ear-marked grants only substitute for money the recipient would have spent on the activity anyway, and the donors end up financing something else. The fungibility of foreign economic assistance can explain the so-called *micro-macro paradox*. The paradox is that whereas many projects financed by aid have had high rates of return the income level in the recipient countries has not been significantly affected by aid flows. More generally, on a cross-country basis it is difficult to detect any significant positive effects of aid in terms of higher rates of economic growth, improvements in income distribution, or reductions in poverty. Thus in the aggregate the optimism of the early years of development economics has not been rewarded. As noted, over time this has led many bilateral donors to endorse conditionality too, principally by "insisting" that countries enter into agreements with the World Bank and the IMF.

The merits of conditionality in inducing actual and lasting policy changes are not too impressing.[37] One of the main reasons for this is that the threat of withholding funds which is the stick of the strategy is not credible. Both the IFIs - in particular, the World Bank - and the bilateral donors have systemic incentives to keep the money flowing. The World Bank needs to ensure that its capital is recirculated and therefore rewards its employees for "pushing" loans; and the bureaucrats of the donor agencies want to spend the funds they have been allocated in order to justify the budgets which pay their salaries.

The lack of success of structural adjustment programs imposed from the outside has lead institutions such as the World Bank to emphasise the importance of "ownership" of reform programmes (World Bank 1998), i.e., that developing country governments are committed to reforms because they voluntarily choose this set of policies. It remains to be seen whether the strategy of picking reformers instead of creating them will make the future of foreign economic assistance brighter than the past.

3 Summaries of Chapters 2-5

3.1 Chapter 2: Political Instability, Political Polarisation, and Public Sector Institutional Reforms

Two noteworthy characteristics of institutions are "durability" and "lumpiness". The first feature is part of the definition of institutions. One of the reasons that institutions are durable is, I believe, that it is not possible to make continuous adjustments in them, i.e., that they are "lumpy". The lumpiness of institutions contributes to making it costly to change them. This is why they can shape policies - if institutions were as easy to change as policies, the former could not restrict the latter and the distinction would be vacuous.

[37] For references, see chapters 3 and 4.

There are no property rights attached to public sector institutions, only control rights. Often, therefore, in order to reap the benefits of reforming the institution(s) he controls, a politician must be able to stay in office. Assuming that reforms do not change the probability of being replaced by political opponents, I demonstrate that compared to a situation of no political uncertainty a potential for losing office will reduce the likelihood of reforms being adopted as long as potential opponents have different preferences (broadly defined). That is, when coupled with political polarisation, exogenous political uncertainty makes it less likely that an incumbent will incur the costs of implementing reforms. Furthermore, the disincentives to reform are increasing in the degree of polarisation.

In light of these findings, the durability of institutions might be recast as inertia. That is, inefficient institutions might prevail because no-one has strong enough incentives to change them on their own. Institutions that once served their purpose well might also become inefficient as the environment changes since the political impetus to adjust them to the new circumstances is small.

However, things might change if the probability of staying in office is affected by the decision on reforms. More precisely, if reforming the institution(s) he controls increases the probability of staying put sufficiently, potential political instability will actually increase the incumbent's incentives to adopt reforms. Moreover, the incentives are greater the higher the degree of political polarisation between him and possible successors.

Above, I demonstrated both that economic growth is increasing in the quality of a country's public institutions and that political instability and polarisation have been found to lower the rate of growth. The model presented in chapter 3 provides a possible link between these empirical results.[38] It is obvious that the efficiency with which the public sector is run will affect the private sector. Other things being equal, lower public sector efficiency implies that more resources have to be transferred from the private sector in order to generate a given amount of activity in the public sector or that less can be done for a given level of transfer. The first possibility is negative whatever the impact of the public sector on the rest of the economy is. The second possibility will have a negative effect on the private sector to the extent that the public sector contributes positively to its productivity. I have already shown that the protection of property rights does increase economic growth. Another example of such productive governmental inputs to private production processes is infrastructure.[39] It might be concluded that if such goods and services are not forthcoming because no politician finds it in his interest to ensure their supply or output is lower than it needs to be because the incentives for adopting productivity-enhancing reforms are weak or non-existent in the public sector, private investment and growth will suffer.

As noted above, in a certain sense it is also possible for reform incentives to be too strong. This might imply that the trade-off between current and future

[38] In addition, it provides an alternative channel through which political instability and polarisation might effect economic growth.

[39] Easterly and Rebelo (1993) present evidence on the positive growth effects of public infrastructure investments.

output is tilted too heavily towards the latter. In a dynamic model, this could translate into an excessively high level of taxation in order to fund the budgetary outlays for continuous reforms. Once again, the result would be that political instability and polarisation have a negative impact on economic growth.

3.2 Chapter 3: Political Will versus Political Power. On the Political Economy of Economic Reforms

A corollary of the proposition that ownership matters is that only those reforms that are wanted by these governments will be chosen and sustained. Non-adoption of reforms is thus a consequence of the lack of political "will" and this kind of will is all it takes to change economic policy-making in a country. However, others have countered that at least in the short run, mainstream policy prescriptions impose hardships on large sectors of the populace. Because of this, the social and political stability of poor countries adopting them will be endangered. Moreover, any change in policies harms those who have benefited from previous policies (particular with respect to trade and regulation). These "vested interests" will not stand idly by when their privileges are threatened. Indeed, in some case they will simply "veto" any change. Thus, even governments who acknowledge the need for reform will not be able to pursue such policy changes because of the negative political repercussions. In this view, "political power" is the sole determinant of reform adoption by developing country governments.

In chapter 3 I investigate the relative merits of these two stylised positions. I assume that there are two types of governments. The reform government wants to scale down the size of the public sector relative to the status quo, which is supported by the other type of government. The relative size of the public sector has been one of the most important issues in the debate on structural adjustment in developing countries. The political constraint from which political power emanates is the electoral constraint. Thus, a government is powerful if it has an electoral advantage. This is in line with many case-studies of the political economy of reform, which concludes that interest groups seems to have played a minor role relative to electoral events in shaping the decisions on whether or not to adopt reforms.[40]

Somewhat surprisingly, I find that under a fairly wide range of circumstances, it is only political will that matters. More specifically, I find that "reform" governments will not emulate "status quo" governments even if this increases the probability that they stay in power (and vice versa). This is so because the gain from being in power in the next period, namely, that policies are determined

[40] See section 3 of the chapter for references. In addition, note that figure 7 reflects what has been dubbed the "third wave" of democratisation (Huntington 1993). In particular, countries in Latin America and Southern and Eastern Europe have become more democratic during the last few decades. Furthermore, on average the developing countries in my sample have become more democratic in this period. This implies that democratic political institutions are becoming a more important in shaping the public policies in these countries, and so supports the use of this framework in chapters 3 and 4.

according to your preferences, is the same as the loss from pretending to be the other type of government in order to fool voters into supporting you. However, the gain comes in the future and is uncertain. Thus, unless future outcomes are given disproportionate weight, it does not pay to postpone reforms. The result holds whether or not the government has access to international credit markets or not. Hence, it supports the currently popular notion that domestic ownership is important if reforms are to materialise.

3.3 Chapter 4: Aspects of the Political Economy of Foreign Aid

In chapter 4 I elaborate on the interaction of reform choice and external financing by analysing what influence a bilateral aid donor seeking to promote reforms might have over domestic policies in recipient countries. This is a highly pertinent issue, for after forty years of economic development assistance, it seems fair to say that economic development has not been assisted. Furthermore, during the second half of this period, donor have sought to impose their policies on governments thought lacking in the will or ability to follow the right course. As noted above, there is no evidence that these efforts have succeeded.[41] One of the major reasons for this is that aid is fungible. Another is that donors lack credible mechanisms for committing themselves to conditional aid strategies.[42] Thus, a realistic assessment of the influence that donors can have in recipient countries has to be based on these two observations.

Previous discussions of fungibility have not taken the strategic interaction of donors and recipients into account. I provide a definition of the degree of fungibility in a strategic context. In such a setting, it can be recast as the degree of influence that a donor has over final outcomes.

Next, I show that influence can be bought, but only at a very high price. This holds true even if the government in the recipient country is reform-minded. Moreover, if the government is democratically elected, the donor might affect the outcome of elections, but if it does it is to the disadvantage of the reformers! Hence the conclusion is that it is probably neither realistic nor advisable for donors to try to leverage their resources in order to buy influence. Instead, they should try to find out which developing country governments are willing to pursue policies that promote economic development (broadly defined).

3.4 Chapter 5: Local-Level Politics and Policy Implementation

Except for the obvious one that it is an exceedingly difficult task, there is probably only one caveat to the statement that donors of foreign economic assistance

[41] See Burnside and Dollar (1997) for empirical evidence on the impact of aid on economic policies in recipient countries.

[42] Indeed, the incentives created by the institutions that allocated aid seem to worsen the time-inconsistency problem of donors, namely, that their interest in assisting recipient countries (whether for strategic or altruistic reasons) render threats of withholding funds empty.

which aim at promoting growth, equality, and poverty reduction should seek to select "good" recipients. The caveat is that politicians do not implement the policies they choose. That is left to bureaucrats, which might have other goals. Since politicians are unlikely to be able to fully resolve their differences with the bureaucrats through contractual means (due to informational asymmetries working in favour of the latter group), realistically one must expect there to be a gap between the policies chosen by politicians and those that the government actually pursues.

In chapter 5 I investigate how implementation gaps might arise by constructing a model with three players. There is a politician with a policy to be implemented by a bureaucrat. However, the bureaucrat is also expected to be "prudent" while executing the policy. The reason might be that the politician fears that "controversy" might endanger his position. The third player is what I call a "strongman". Strongmen are politically powerful figures at the local or regional level. Large landowners, industrial magnates, and ethnic or religious leaders are obvious examples. These have social and economic power over the populace in their area, and might seek to use this power either directly to pressure the bureaucrat into deviating in implementation or indirectly by "making a fuss" which will harm the politician. In turn, the latter will respond by derailing the bureaucrat's career.

Thus, all actors take potentially costly actions. Costs are imposed on bureaucrats which are caught deviating in implementation and/or are unable to stave off social unrest in response to their choices. The strongman incur costs if he wants to protest the policy implemented by the bureaucrat. Finally, the politician must expend resources if he is to find out what has transpired between the first two players.

If these monitoring costs are not prohibitive, i.e., not so high that he will never intervene whatever he may suspect about the interaction of the bureaucrat and the strongman, I find that implementation gaps arise. This is because some types of bureaucrats will collude with the strongman against the interests of their superiors. Others, however, will heed the Principle of accommodation by adapting to the credible threats of strongmen whose interests are aligned with those of the politician. This reduces the maximum size of the implementation gap that can arise. However, if the monitoring costs of the politician incurs are prohibitive any bureaucrat is free to do as he pleases and the strongman is powerless in trying to prevent him from doing so whether or not he wants to.

In sum, the model demonstrates that even committed reformers might come up empty-handed against the complex web of social relations and local-level politics that envelop the bureaucracies in developing countries.

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Chapter 2

Political Instability, Political Polarisation, and Public Sector Institutional Reforms*

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Abstract

For politicians in office, reforming public sector institutions is an investment; they must spend resources now in order to achieve future gains. There are no property rights attached to these institutions. Therefore, politicians need to remain in control if they are to reap the benefits of reform. Political uncertainty changes the "returns" to investment compared to a benchmark of no uncertainty. When political uncertainty is exogenous, the non-appropriability of future benefits in case of political change results in a lower critical value for the cost of investment if there is political polarisation between incumbent and challenger(s). The reduction in the cut-off rate is increasing in the degree of polarisation. However, if reforms increase the probability of staying in office, the likelihood of investment might increase, the more so the greater the polarisation in preferences.

1 Introduction

From the point of view of a politician holding office today, creating or reorganising public sector institutions is an investment; in order to realise future gains, he must spend resources at his disposal now. These resources could have been utilised for current purposes, thus creating an opportunity cost of institutional change. One example of this is using budgetary funds to gather the requisite information, design, and establish an organisation instead of spending them on the political tasks of today. Another is a politician allocating his limited time to achieve changes in formal procedures of operation. As institutions, I shall define both rules and organisational structures.[1] Because informal institutions

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[1] North (1990), for example, distinguishes between institutions and organisations. But if "institutions include any form of constraint that human beings devise to shape human interaction" (p.4), then organisastions can be viewed as sets of institutions, e.g. rules of

such as customs are unlikely to be amenable to purposive design, the focus will be on formal institutions. The returns to reforming the latter accrue in the future in the form of cost savings, a more efficient allocation of resources, or the production of new goods and services which are valuable either personally or politically.

An important feature of public sector institutions is that there are no property rights attached to them. Through his office, say as the leader of a ministry, a politician might have control rights over public sector units. These rights might include the liberty to determine what goods and services are to be produced and in what quantities and to decide on the distribution of the output of the units controlled. Such rights are obviously useful for achieving a variety of ends that a political officeholder might have. But he cannot sell these rights to his successor, not even when he has created these units himself. Often, therefore, he can only reap the fruits of his efforts in building institutions as long as he retains control over them. It follows that his expected tenure is an important determinant of the expected benefits from such activities. The expected tenure of a politician in a democratic country is usually closely linked to elections. However, governments sometimes change between elections, prompting changes in personnel, the extent of which depends on the number of positions filled through political appointments. In autocracies, of course, political change is ordinarily not institutionalised. Still, there is generally a positive probability of a change in government or regime, and not infrequently the "politics of survival" dictate rotations or substitutions of personnel at the higher echelons of the state.[2] While the form changes, potential political instability is an ever-present feature of politics regardless of regime. The claim made here is that the degree of such instability is important for the institutional development of the public sector because the higher the probability of retaining office, the greater the share of the benefits appropriated by the person making the investment decision. As political instability is more severe in low-income countries, this might explain why public administrations generally seem to work less well there. For example, this argument would lead one to expect that the political control of the bureaucracy is weaker in these countries, and casual empiricism certainly suggests that it is in fact so.

Notably, the polities of the former Third World also tends to be more polarised politically. As shown below, for politicians who are policy-motivated - whether for ideological reasons or because they represent some constituency - this strengthens the effect of political instability on reform incentives. While political instability affects the likelihood of "good" or "bad" states occurring, political polarisation determines how much better the "good" state is than the "bad". If the current office-holder is purely motivated by policy concerns, he would be indifferent between continuing in office and being replaced by another politician with identical preferences. Conversely, the greater the differences

operation. While other features such as functional roles can also be used to characterise organisations, these are of no importance to the argument made in this paper and I therefore prefer the more inclusive definition adopted here.

[2] See Migdal (1988) for a discussion of the "politics of survival".

between an incumbent and his challenger(s), the greater the consequences of losing office. Consequently, the lower are the incentives to reform public sector institutions for a given probability of remaining in office.

There might also be a third effect in operation: if investing in public sector institutions affects the probability of retaining office, the calculus of the incumbent is changed. Obviously, if sacrificing current resources for future gains reduces this probability, he will be less likely to do so. But if investing in the institutions he controls today improves his chances of staying put, there are benefits from doing so over and above those relating to increases in future output or the production of new goods and services. Therefore, the effect on the desirability of reforms in the eyes on an incumbent politician can depend crucially on whether such acts affect the probability of retaining office and if they do, in what direction. And in sum, political polarisation combines with political instability to determine the net incentives for changing the institutional structure of the public sector.

The remainder of this paper is organised as follows. In the next section I first describe certain generic features of institutions and illustrate them with examples from the public sector. I use this to relate the issue analysed here to previous work in political economy. The formal analysis is presented in sections 3 and 4. In section 5, I argue that the quality of public sector institutions is another avenue through which political instability and polarisation might retard growth. Both of these effects, i.e., from instability and polarisation to growth and from the quality of public sector institutions to growth, have independently been established in recent empirical work. Section 6 concludes the paper.

2 Public Sector Institutional Reforms: Examples and Relation to Existing Literature

2.1 Generic Features of Institutions

The model developed below belongs to the rapidly growing literature on the political choice of state variables such as the public debt. Because state variables affect the future, they allow incumbent politicians to influence tomorrow's policies and the outcomes generated by them. Hence the interest in studying the effects of political uncertainty and polarisation on the choice of state variables. By definition, institutions are "durable". In other words, they are state variables. Institutions tend to be "lumpy" as well, in the sense that they cannot be continuously adjusted. The durability and lumpiness of institutions distinguish the choice of them from the choice of policies, and combines to make it more costly to change the former than the latter.

In the model analysed below, a rather abstract "productivity-enhancing" reform is possible. However, it is easy to come up with real-world equivalents of such an act. A literal interpretation is one example. That is, improving organisational procedures in a ministry and buying a new computer system for a bureau are measures that should increase the productivity of employees.

Though, buying software and paying consultants to set up the new system compel the head of the bureau to spend budgetary funds that could have been used to increase supply today. For instance, more case-workers could have been hired. The ensuing period of lower productivity while employees learn their way in the new system also results in fewer cases being processed, fewer investigations being undertaken, or less or whatever the organisation is producing. Thus, there is a trade-off between current and future output.

Likewise, improving monitoring and control of personnel might deter shirking, moonlighting, corruption, and theft. These effects contribute towards raising output once the improvement has taken place, either directly (less shirking and moonlighting) or indirectly (because what has been stolen has to be replaced in order to keep productivity constant). Preventing corruption might even result in a better "real" output mix from the view-point of the politician in charge; at the very least, his ability to control the output mix is increased. All of these effects are real gains to him. However, devising the optimal changes in organisational procedures necessitates the spending of resources such as time (either his own or that of his sub-ordinates) or money (as when outside consultants are used). These resources could have been spent on the production of more goods and services now. Moreover, if the probability of losing office is positive, some other politician might reap part of the benefits from improved organisational efficiency. The institution could also be geared to other tasks which today's incumbent values less, in which case greater future efficiency will be of even smaller benefit to him.

Note that institutional reforms differ from policy reforms. An example which illustrates the distinction is changes in tax rates versus changes in tax bases. The direct costs of the former are very small and the change can be implemented by "a stroke of the pen". The latter requires not only empirical investigation to establish optimal reforms; usually quite extensive changes in administrative procedures have to be made and the political process might consume both valuable time and political capital in the form of sacrifices on other issues to pull reforms through.[3] On the other hand, it is clear that major policy reforms often necessitate institutional changes in order to become durable (and thus credible). For instance, implementing a less expansionary monetary policy might not be credible unless the central bank is made more independent of politics. Normally, such a change will demand both administrative and political resources in more than marginal quantities before the new policy is operative. In other words, there are fixed costs of constituting a new regime.

The creation of organisations to perform new tasks is perhaps the kind of reform that most directly demonstrates the lumpy nature of such undertakings. Examples include state-owned enterprises, agencies, ministries, and sub-units of such organisations. The resources spent on designing them, screening new

[3]Of course, there might also be political costs of changing tax rates. But the durability of institutions implies that changes in them have much greater long-term consequences than policy changes have. This tends to make the former more important politically than the latter. Furthermore, political institutions might increase the political costs of changing administrative structures and processes, say, because supermajorities are required.

employees, and buying the equipment needed clearly represent a fixed cost of getting the production of goods and services up and running. Whether the output is to be sold in markets, distributed for free to eligible citizens, or consumed by the politicians themselves (e.g. staff services produced by bureaucrats), a share of the resources available for productive purposes today is in this case devoted to making an expanded range of products available in the future. As we shall see, political uncertainty then might prevent this kind of investment from materialising because politicians cannot be certain that they or their political allies will share in the benefits when they arrive.

2.2 Relation to Existing Literature on the Political Choice of State Variables

The political economy of public debt is the issue that has received the most attention in the literature on the strategic manipulation of public sector state variables; a number of authors have studied this subject in various guises.[4] The general conclusion that follows from this line of work is that *(potential) political instability changes the optimal choices of politicians by changing their evaluation of expenditures over time.* That is, a government will spend differently when there is a positive probability of being replaced than it would if it had been certain to continue in office.[5] Changes in the stock of debt alter the constraints facing other actors, like voters (influencing election results) or future governments (influencing their spending patterns or the level of public expenditures). In most models, manipulating the level of the debt bequeathed to the future affects only the latter. That is, election outcomes are not influenced by the optimal policies of future governments and hence not by variations in the size of the public debt. Two important exceptions are Milesi-Ferretti (1995) and a recent paper by de Wolff (1996), where such a link exists.[6]

A related result is derived by Cukierman, Edwards, and Tabellini (1992): governments fearing that they will be replaced by others with different preferences over public expenditures will keep the efficiency of the tax system low so as to constrain the revenue-generating capacity of their adversaries (or increase the dead-weight costs of collecting revenues).[7] The tax system is a public institution as defined here. However, they assume that the efficiency of the tax

[4] Examples include Aghion and Bolton (1990), Alesina and Tabellini (1990), Milesi-Ferretti (1995), Persson and Svensson (1989), Tabellini and Alesina (1990), and de Wolff (1996).

[5] Note that it is the possibility of being replaced that matters here. Whether a change occurs is determined after the fact, i.e., after the setting of policy today has been completed.

[6] Of the six papers mentioned in footnote 4, two (Persson and Svensson 1989 and Tabellini and Alesina 1990) contain analyses of the outcome when the median voter might change between periods and another (Alesina and Tabellini 1990) describes a two-party model with exogenous probabilities of winning the election (which can be interpreted as a probabilistic voting model under policy-maker discretion). In the model of Aghion and Bolton (1990), policy influences election outcomes under some conditions only, leaving Milesi-Ferretti (1995) and de Wolff (1996) as the only "pure" studies of how today's debt policies might affect election results when voters are rational.

[7] Also see Milesi-Ferretti and Spolaore (1994). In that paper, the probability of getting re-elected is affected by the incumbent government's actions in some conditions.

system is a state variable that can be costlessly changed. As argued above, I think that there are costs associated with making these changes, and it seems reasonable to expect this to be a general feature of reforms. Therefore, in the model developed below I study costly institutional reforms.

Glazer (1989) discusses how political instability might distort the political choice between projects of different duration. He demonstrates that the commitment-power of durable (two-period) projects might lead to their adoption in situations where no project or a short-lived (one-period) one would be preferred if current policy-makers were certain to continue in office. For example, if a durable project precludes the adoption of a short-lived one in the future, it can make the preferences of today's policy-makers prevail tomorrow even if the hands of future policy-makers, who might evaluate project benefits differently, cannot be tied directly. The preferences of possible successors are not modelled by Glazer (1989), however. This precludes a discussion of how political instability and political polarisation interact. As the policies and outcomes under a succession of identical decision-makers would be the same as those produced by having one of them in charge all of the time, it is clearly necessary to analyse explicitly differences in preferences between current and (potential) future policy-makers. The model presented below allows me to do so in a context where the choice is between adopting a "project" or not.

In this paper, I develop two variants of a model of public sector institutional development. In the first, the probability of losing office is not affected by the actions of the current policy-maker. When the probability of being replaced is exogenous, political uncertainty always reduces the likelihood of investment being made, the more so the less certain of retaining his position the current office-holder is and the greater the difference between his and the challenger's optimal policies in period 2. The intuition for the results can be better understood by exploring the analogy with public debt. We get "under-investment" in public sector institutions in the context of exogenous political uncertainty because of the non-appropriability of future benefits in the case of political change, just like partisan governments in these conditions tend to borrow "excessively" because this is the only way of being certain that they will in fact decide the way future funds are spent.[8] Either way, more resources are consumed today relative to tomorrow than would have been the case had the politicians currently in office been convinced that their positions were secure. And the extent of "over-consumption" is positively correlated with differences in preferences between incumbent and challenger.

In section 4, I make the extension to the case where there is a link between reform choice and the probability of losing power. It is shown that this extension might significantly affect the results. Of course, the results just reported are strengthened if investing in public sector institutions lowers the probability of

[8]The excessive borrowing result is not general, but intuitively, it seems the most plausible one. It is a possible outcome in the models of Alesina and Tabellini (1999) and Tabellini and Alesina (1990), for example. Naturally, the predictions about government behaviour described here reflect the incentives created by potential political instability and ideological polarisation which are but a sub-set of the determinants of the public debt.

staying put. Though, if such an action produces a "significant" increase in this probability, the results might be reversed. That is, the incentives to invest might actually be spurred by political uncertainty, and political polarisation will then tend to work towards increasing the likelihood of investment.[9] Similar contingent results are derived in de Wolff (1996) where the production of public goods today affects the election results because it determines the level of the public debt which in turn has an effect on next period's optimal policies.[10]

3 Exogenous Probability of Replacement

3.1 Model Structure

There are two political alternatives, an incumbent (I) and a challenger (C). The incumbent occupies an office in period 1, but might be replaced by C in period 2. I and C can be collectives like parties or individual politicians. For simplicity, I will only speak of the latter. The political office conveys the power to decide on the quantity produced of each of two "goods", X and Y, and to determine whether productivity-enhancing measures should be undertaken. I follow the literature on the strategic use of public debt in assuming that politicians are ideologically motivated. That is, they have preferences over the policies that are to be set.[11] The per-period objective function of politician i is

$$(1)U^i(Q_t; j_t) = \left[\delta^{Xi}(j_t) X_t\right]^{\alpha^i} \left[\delta^{Yi}(j_t) Y_t\right]^{1-\alpha^i}, i = I, C, t = 1, 2;$$

where $\alpha^i \in (0,1)$ and $Q_t = \{X_t, Y_t\}$.[12] $j_t \in \{I, C\}$ denotes the identity of the politician holding office in period t. The functions $\delta^{hi}(j_t)$ satisfy

$$(2)1 = \delta^{hm}(m) \geq \delta^{hm}(n) \geq 0; h = X, Y; m, n = I, C, m \neq n;$$

with at least one of the inequalities being strict. These functions are meant to capture disagreement between the politicians about how to distribute the goods or services produced within the institution in question. More specifically, $\delta^{hi}(k)$ is the share of units of good h that are distributed according to i's wishes when k is in office at time t. Thus, I allow for both ideological differences between incumbent and challenger over the total amount of each good or service to be produced, and for the possibility that they have different "constituencies" which

[9] That is, we might get "over-investment" compared to a situation with no potential for political instability.

[10] Also see Milesi-Ferretti (1995).

[11] Purely office-motivated politicians of the standard variety (i.e., coveting some exogenous "gain from holding office") would be meaningless in the present context where it is assumed that the probability of staying in office is exogenous. When it is endogenous, as in the next section, the behaviour of office-motivated politicians is trivial: they choose the action that results in the highest value of this probability.

[12] In this paper, parantheses are reserved for functional arguments.

they would like to supply.[13] As we shall see, the Cobb-Douglas specification used in (1) yields an attractive measure of political polarisation.[14]

The technology for producing the goods has the following simple form:

$$\begin{array}{l}(3a)X_t = f\left(K_t^X\right)b_t^X; \\ (3b)Y_t = g\left(K_t^Y\right)b_t^Y;\end{array} \quad ;t = 1,2.$$

b_t^h is the amount of budgetary funds spent on the production of good h in period t. $f\left(K_t^X\right)$ $\left(g\left(K_t^Y\right)\right)$ is the marginal (and average) productivity of funds, K_t^X $\left(K_t^Y\right)$ being the "capital stock" vested in the production of X (Y) at the beginning of period t. The latter can be interpreted as the level of resources that has been invested in productivity-enhancing measures in earlier periods. For simplicity, I will assume that it is not possible to improve the technology for producing good X, whereas there is room for increasing the productivity of budgetary funds in the production of good Y in period 2. This can be done by paying a fixed cost $F > 0$ in period 1. Denoting the investment variable by κ, these assumptions can be formally summarised in the following manner:[15]

$$\begin{array}{rcl}(4a)f\left(K_1^X\right) & = & f\left(K_2^X\right) = \chi > 0; \\ (4b)g\left(K_1^Y\right) & = & \underline{v} > 0; \\ (4c)g\left(K_2^Y\right) & = & g\left(K_1^Y + \kappa\right) = \left\{\begin{array}{l}\underline{v}\ if\ \kappa = 0, \\ \overline{v} > \underline{v}\ if\ \kappa = F.\end{array}\right.\end{array}$$

In each period, the total budget available is fixed and normalised to 1. Of course, no productivity-enhancing measures will be undertaken in period 2, so there is one unit of resources available for production. If I does not pay F in period 1, the total budget will be spent on production in period 1 as well. However, if I does decide to pay the fixed cost, there will be only $1 - F$ left for producing the goods in the first period:

[13] A more thorough discussion of these issues follows in sub-section 3.4.

[14] Other specifications of the politicians' objective functions would lead to similar results without having this desirable property. Some of these would allow the incumbent to influence next period's choices (budget shares) whereas the functional form utilised here only allows him to influence next period's outcomes (production levels). However, as the strategic incentive for policy-motivated to manipulate state variables is well known, I prefer the sharper focus on the effects of polarisation and instability on the quality of the public sector institutions that I get by using the Cobb-Douglas form.

[15] The investment choice is made discrete because it seems realistic to assume that institutional reforms are "lumpy", at least in the sense that infinitesmal changes are not possible. More generally, the specification of the technology presented in (4) is not as restrictive as it might seem. It can be shown that the nature of the results is not affected by making output of good h a strictly concave function of K_t^h and/or b_t^h or a continuous function of K_t^h (i.e., making κ a continuous varaible). Likewise, studying reforms that improve the productivity of funds in the production of both goods does not alter the qualitative properties of the conclusions. For proofs of these and subsequent claims and results, see the appendices.

$$
\begin{aligned}
(5a) b_1^X + b_1^Y + \kappa &= 1; \\
(5b) b_2^X + b_2^Y &= 1.
\end{aligned}
$$

By maximising (1) subject to (5) in each period, it can be deduced that the optimal allocation of budgetary funds to the production of each good is equal to its weight in the objective function of the politician holding office times the resources available for production. Using these results and (2), we can succinctly state the expected maximal value of the sum of I's per-period objective functions as a function of κ as follows (for simplicity, discounting is ignored):

$$
\begin{aligned}
(6) V^I(\kappa) &= U^I(Q_1; I) + E\left[U^I(Q_2; j_t)\right] \\
&= \left\{\chi \alpha^I [1-\kappa]\right\}^{\alpha^i} \left\{\underline{v}\left[1-\alpha^I\right][1-\kappa]\right\}^{1-\alpha^i} \\
&\quad + p(\kappa)\left\{\chi \alpha^I\right\}^{\alpha^i} \left\{g\left(K_1^Y + \kappa\right)\left[1-\alpha^I\right]\right\}^{1-\alpha^i} \\
&\quad + [1-p(\kappa)]\left\{\delta^{XI}(C)\chi \alpha^C\right\}^{\alpha^i} \left\{\delta^{YI}(C) g\left(K_1^Y + \kappa\right)\left[1-\alpha^C\right]\right\}^{1-\alpha^i}.
\end{aligned}
$$

Because the decision on whether to undertake productivity-enhancing measures is discrete, we must compare two distinct values of $V^I(\kappa)$, $V^I(0)$ and $V^I(F)$. As can be seen from (6), the value of the objective function in period 2 is uncertain, with $p(\kappa)$ denoting the probability that I retains his position. Hence, the potential for losing office might influence I's first-period decision on whether to pay F or not. I will now go on to discuss how this effect varies with different assumptions about the politicians' objective functions. Throughout this section, it will be assumed that the probability of retaining office is exogenous, i.e., not affected by I's actions. That is, $p(0) = p(F) \equiv p$. Since there is only a single challenger, C decides on the production of X and Y in period 2 with probability $1-p$.[16]

3.2 A Benchmark: no political uncertainty

It is useful to have a benchmark against which we can compare the effects of political uncertainty. The natural benchmark is the case where there is no such uncertainty so that I is ensured a two-period stay in office. Thus, here $p \equiv 1$.

Denote the two-period pay-off to I in this case by $V^{I*}(\kappa)$. If $V^{I*}(0) > V^{I*}(F)$, I should not invest in higher productivity in the production of good Y in period 2. If on the other hand the inequality is reversed, that is exactly what he ought to do. If the two expressions are equal, both actions result in

[16] This is for ease of exposition only. In appendix B, I prove that the results generalise to an arbitrary number of challengers. The only new feature is that due to differences in the attractiveness of various challengers in the eyes of the incumbent, changes in the probability of one challenger winning might affect the cut-off rates derived below even if the probability of I retaining his position remains constant.

the same pay-off. Clearly, an important determinant of the relative value of the pay-offs from these two actions is the size of the fixed cost. We can find a value of F such that if F actually exceeds this value, I should set $\kappa = 0$; if F equals this value, I is indifferent; whereas if F is lower than the cut-off level, investing is the optimal thing to do. The cut-off level $\overline{F}^*$ is of course found by solving $V^{I*}(0) = V^{I*}\left(\overline{F}^*\right)$. Carrying out this exercise, we get

$$(7)\overline{F}^* = \left(\frac{\overline{v}}{\underline{v}}\right)^{1-\alpha^I} - 1 \equiv \omega^{1-\alpha^I} - 1.$$

Observe that since $\overline{v} > \underline{v}$ and $\alpha^I < 1$, $\overline{F}^* > 0$.[17] Hence, for sufficiently low values of F, I will find it worthwhile to invest. Also note that the preferences of C do not appear in (7). That is, when there is no potential for instability, polarisation is of no consequence.

In the following, I will investigate how political uncertainty affects the level of fixed costs which makes I indifferent between investing and not. If potential political instability is found to lower (increase) the cut-off level, the conclusion that can be drawn is that such instability weakens the incentives to undertake productivity-enhancing measures because the hurdle that has to be surpassed in order to make it optimal to invest is higher (lower); for some values of F for which I will choose $\kappa = F$ ($\kappa = 0$) when he is certain to carry on at the helm, he will reach the opposite conclusion when he is not.

3.3 The Pure Case of Political Instability and Polarisation

To generate a potential for political instability, I set $p < 1$. Furthermore, it is assumed that $\delta^{hI}(C) \equiv 1, h = X, Y$. In other words, I first look at the case where the only potential source of discrepancies between the situation in which I retains his office in period 2 and that in which C takes over are differences in the weighting of the two goods in the objective functions leading to unequal optimal budget shares.

The investment hurdle in this situation is calculated using the same procedure as above, yielding

$$(8)\overline{F}^{**} = \left[p + [1-p]\,\sigma\left(\alpha^C\right)\right]\left[\omega^{1-\alpha^I} - 1\right],$$

where

[17] If $\omega > 2^{\frac{1}{1-\alpha^I}}$, the cut-off rate exceeds one. Because the total budget equals one in both periods, this implies that the cut-off rate ceases to be binding in the sense that for any fixed cost less than or equal to the total budget, investing is the optimal thing to do. In the following, I ignore this corner solution. Furthermore, note that the cut-off rate depends on the preferences of the incumbent: the more he values good Y, the higher the cut-off rate. This feature does not affect the qualitative properties of the results derived below and so will not be discussed.

$$(9)\sigma\left(\alpha^C\right) = \left[\frac{\alpha^C}{\alpha^I}\right]^{\alpha^I}\left[\frac{1-\alpha^C}{1-\alpha^I}\right]^{1-\alpha^I}$$

is a measure of the degree of *similarity* of preferences between I and C (thus its inverse is a measure of *polarisation*). The degree of convergence between the weights on the two goods is weighted by the importance of the good in I's objective function. Since it is assumed that $\alpha^i \in (0,1)$, $i = I, C$, $\sigma\left(\alpha^C\right)$ is well defined. Its properties are given by the following lemma:

$$\begin{aligned} &\textbf{Lemma} \quad : \\ &1)\sigma\left(\alpha^I\right) = 1; \\ &2)\sigma\left(\alpha^C\right) = 1, \alpha^C \neq \alpha^I; \textit{and} \\ &3)\lim_{\alpha^C \to 0}\sigma\left(\alpha^C\right) = \lim_{\alpha^C \to 1}\sigma\left(\alpha^C\right) = 0. \end{aligned}$$

That is, if I and C have identical preferences, the measure takes on a value of unity. If C's preferences differ from I's, however, the value of the measure is less than one, and in the limit, when the "distance" between the politicians' weighting of the goods becomes maximal (in either direction), the value of the measure is zero.[18]

Comparing (7) and (8), we get

Proposition 1 *1) The absence of polarisation means that potential instability has no effect on reform incentives;* $\forall p$*:* $\sigma\left(\alpha^C\right) = 1 \Longleftrightarrow \overline{F}^{**} = \overline{F}^{*}$. *2) A positive degree of polarisation means that instability reduces reform incentives;* $\forall p < 1$*:* $\sigma\left(\alpha^C\right) < 1 \Longleftrightarrow \overline{F}^{**} < \overline{F}^{*}$. *3) When there is political uncertainty, reform incentives are a decreasing function of the degree of polarisation;* $\forall p < 1$*:* $\frac{\partial \overline{F}^{**}}{\partial \sigma(\alpha^C)} > 0$. *4) when there is polarisation, reform incentives are a decreasing function of the probability of losing office;* $\forall \sigma\left(\alpha^C\right) < 1$*:* $\frac{\partial \overline{F}^{**}}{\partial p} > 0$.

Not surprisingly, political instability is of no importance in the current case if I and C have identical preferences. For $\sigma\left(\alpha^C\right) = 1 \Longleftrightarrow \alpha^C = \alpha^I$, (8) reduces to (7).[19] However, inspection of (8) informs us that the slightest divergence between incumbent and challenger in the weights attached to the goods implies $\overline{F}^{**} < \overline{F}^{*}$. In other words, even a minimal degree of ideological disagreement results in the incentives for undertaking productivity-enhancing reforms being weaker when there is political uncertainty. And the greater the divergence in

[18] For $\alpha^I \neq 0,5$, $\sigma\left(\alpha^C\right)$ is not symmetric around α^I. This is due to the fact that the degree of preference-similarity is weighted by the importance of the two goods to I so that divergence in the weighting of a good becomes less important the less weight I puts on it. However, the lack of symmetry is not particularly interesting for our purposes and so is ignored.

[19] The equivalence of no polarisation and no potential instability would be broken if political officeholders are partly office-motivated, i.e., if there are some benefits from being in office which are independent of being able to determine policies.

views, the weaker the incentives become: $\overline{F}^{**}$ is increasing in $\sigma\left(\alpha^C\right)$. Thus, as the preferences of I and C becomes less similar ($\sigma\left(\alpha^C\right)$ goes down), $\overline{F}^{**}$ is reduced, i.e., there are fewer levels of F for which it is optimal to invest. Furthermore, as long as $\alpha^C \neq \alpha^I$, the less secure I feels about his prospects of retaining office, the greater the hurdle that has to be surpassed for investment to become optimal (as p goes down, so does $\overline{F}^{**}$).[20] The proposition that potential political instability is antithetical to reforming public sector institutions in the environment assumed here is thus proved.[21]

3.4 Disagreement between Incumbent and Challenger over Distribution

Being in office might be important not only because it confers the power to decide on how much should be produced. In addition to such a "pure" ideological effect, a politician will usually derive some benefit from being able to determine the distribution of the output from the organisation he controls among members of society. Even for a pure public good in the Samuelsonian sense, it matters politically where it is produced or located, and since most publicly produced goods and services are not public goods in the strict sense, it matters even more.[22] In politics, a national museum located in one city is not the same as an identical national museum located in another; placing it within or outside of his constituency is likely to mean a great deal to a politician's chances of being re-elected, and so is the number of contracts given to firms who have contributed to his election campaign when the museum is to be built.[23] More generally, distributing goods and services to electoral constituency, campaign contributors, local political leaders, or any other individual, group, or organisation that is important to a politician personally or politically is greatly facilitated by holding the reins of power.

While many of the reasons why distribution matters pertain to office-related motivations for a politician, it is obvious that a politician might also have an intrinsic concern for these issues because of ideology or altruism (towards family, friends, ethnic group, etc.). In any case, as one has to be in office to be able to set public policies, in practice partisan concerns often mix with incentives generated by the process by which one achieves political power. The objective functions assumed here are general enough to allow one to interpret the benefit derived from the distribution of the two goods in terms of corruption, nepotism, or ideology. Furthermore, even though some of the reasons why it could be important for a politician to be in office pertain to the impact he can make on the likelihood of continuing there - and thus sits a little uneasy with the

[20] In passing, note that only in the extreme case where $p = \sigma\left(\alpha^C\right) = 0$ is $\overline{F}^{**} = 0$. In all other case, I retains an incentive to invest even if productivity increases are not free.

[21] Observe that adding more goods for which productivity increases cannot be achieved would add more weighted preference ratios to the measure of preference compatibility. It is easily seen that this would not affect the conclusions.

[22] Aranson and Ordeshook (1981).

[23] For an elaboration on this subject, consult e.g. Weingast, Shepsle, and Johnsen (1981).

assumption that p is exogenous - it should be clear from the discussion above that there are also distributional factors which are important in their own right.

In this section, I shall investigate the consequences of this fact for a politician's willingness to reform an institution he controls. Formally, this means that I will be looking at the case where $\delta^{hI}(C) < 1$ for at least one h. To minimise notation, I will use δ^{hI} instead of $\delta^{hI}(C)$ from now on.[24] The interpretation of this variable is that it measures the share of units of good h which are distributed according to I's wishes when C is in office. It is thus a measure of the degree to which the two politicians concur in the optimal distribution of the goods and services produced by the organisation for which they compete for control (have the same constituency broadly defined). For the sake of simplicity, distributional issues are not analysed explicitly. They would in any case be separable from the decision problem studies here.

The cut-off level for the fixed cost of reform now becomes

$$(10)\overline{F}^{***} = \left\{p + [1-p]\sigma\left[\delta^{XI}\right]^{\alpha^I}\left[\delta^{YI}\right]^{1-\alpha^I}\right\}\left[\omega^{1-\alpha^I} - 1\right].$$

Comparing (10) with (7) and (8), we have

Proposition 2 *1) Distributional conflict reduces reform incentives as long as there is potential instability;* $\forall p < 1$*:* $\delta^{hI} < 1 \Longleftrightarrow \overline{F}^{***} < \overline{F}^{*}$, $h = X, Y$. *2) Distributional conflict magnifies the negative effect of polarisation on reform incentives as long as there is potential instability;* $\forall \{p, \sigma\}$ *such that* $p < 1$ *and* $0 < \sigma < 1$*:* $\delta^{hI} < 1 \Longleftrightarrow \overline{F}^{***} < \overline{F}^{**}$, $h = X, Y. \Longleftrightarrow \overline{F}^{**} < \overline{F}^{*}$. *3) As long as there is potential instability and polarisation over production and distribution is not extreme, the greater the distributional conflict, the weaker the reform incentives;* $\forall \left\{p, \sigma, \delta^{nI}\right\}$ *such that* $p < 1$, $\sigma > 0$ *and* $\delta^{nI} > 0$*:* $\frac{\partial \overline{F}^{**}}{\partial \delta^{mI}} > 0$, $m, n = X, Y$, $m \neq n$.

>From (10), it is readily apparent that it is still the case that the lower p is, the less inclined to pay F will I be. Furthermore, it can be seen that when holding office takes on the added importance emphasised here, the disincentives generated by potential political instability are magnified. Except when differences in preferences are extreme, $\overline{F}^{***} < \overline{F}^{**}$. Moreover, even when I and C weigh the goods in exactly the same way $\overline{F}^{***} < \overline{F}^{*}$, as could be the case when two politicians from the same party compete for the job as head of a particular ministry. When they cater to different agents in society, say because they represent different ethnic groups, I would still worry about losing power. These worries might keep him from spending funds which are valuable today for purposes that yield benefits only tomorrow. The greater the disagreement over distributional issues, the greater the discouragement to reform: $\frac{\partial \overline{F}^{**}}{\partial \delta^{XI}}$ and $\frac{\partial \overline{F}^{**}}{\partial \delta^{YI}}$ are both greater than zero as long as $\sigma > 0$, δ^{XI}, and δ^{YI} are all positive;

[24] Likewise, I will replace $\sigma\left(\alpha^C\right)$ by σ.

and $\lim_{\delta^{hI}\to 0} \overline{F}^{***} = p\left[\omega^{1-\alpha^I} - 1\right] = \lim_{\sigma\to 1} \overline{F}^{**} = 0$, $h = X, Y$.[25] This points to the importance of rules governing distribution, say eligibility rules. If uniformity is imposed from the outside, a potential source of contention between incumbent and challenger is removed. Thus, if such rules can be made binding, a disincentive to reform is removed.

4 Endogenous Probability of Replacement

4.1 Introductory Remarks

So far we have not paid much attention to what the probability of continuing in office is derived from. Most of the models of the effects of political instability on economic policy choice are set in the context of democratic elections of government. In fact, as they depict two-party systems they are all even more specific than that. In my opinion, the mechanism discussed in this paper is more general than national-level democratic elections. My claim is that it is important whenever a politician holding an office which allows him to make decisions about whether to sacrifice resources with valuable current uses faces an uncertain prospect of retaining his position. Hence, the mechanism is at work with dictators, democratically elected presidents, prime ministers leading minority coalitions risking defeat at the hands of the parliamentary opposition, and ministers facing would-be ministers be they from the same party or from another clique within a dictator's entourage. It even applies to high-ranking bureaucrats having the same kind of decisional powers in an agency or bureau, at least if they are appointed politically. However, with the exception of electoral competition (and possibly collective action models of revolutions), we do not (yet) have an apparatus that allows us to derive political uncertainty from first principles. Hence, the sort of general approach applied here will have to do.

Still, it is of interest to consider the case where the incumbent's actions affects his probability of staying in power. In section 2, I observed that while many of the models of political instability and economic policy do not allow for such an influence, the conclusions often depend on this assumption. And it is easy to point to reasons why the probability of continuing in office might be endogenous in the present model. For instance, the investment decisions made by I in period 1 affects the level of output of both goods in period 1 and of Y in period 2. When I and C differ in their preferences and so choose different budget shares for the two goods, the difference in the level of production of Y between their regimes is influenced by the marginal product of budgetary funds for Y. If their expected performance in office affects their chances of capturing power,

[25] A dictator fearing that he will be replaced by a rival could be an example of the extreme case where $\delta^{XI} = \delta^{YI} = 0$. Whether the objective function is interpreted literally as the dictator's utlity from consuming goods produced by his employees or as including the benefits he derives from distributing a share of the production to his entourage, it seems reasonable to venture that neither he nor them will derive any benefits if he loses power.

I's choice of κ will have an impact on p.[26] Alternatively, p might be influenced by today's performance in office. This could happen if agents taking actions which affect p do not know everything about I. For example, his preferences might not be common knowledge. Similarly, the marginal product of budgetary funds in the production of either or both goods might be individual-specific because the competency of the leadership in running the organisation matters for efficiency and only I knows how productive he is. The incumbent's choice of might then reveal information of importance to the decisions of these other agents. Subsequently, their actions will affect p.[27] A concrete example would be a minister whose competency in running his ministry is not known by the prime minister. By observing the minister's first-period actions, the prime minister might be able to infer whether he would be better off replacing him. In either case, prospectively or retrospectively, the probability of retaining office will be some kind of function of κ.

In this section, therefore, let $p = p\left(Q_1^I(\kappa), Q_2^I(\kappa), Q_2^C(\kappa)\right) \equiv p(\kappa)$, where $Q_t^i(\kappa) = \left\{X_t^i(\kappa), Y_t^i(\kappa)\right\}$ are the optimal levels of production of the two goods for politician i for a given value of κ.[28] The benchmark of no political uncertainty can now be seen to be the special case where $p(0) = p(F) = 1$. It is therefore unchanged, and in the remainder of this section I discuss cases where $p(\kappa) < 1$ for at least one value of κ.[29]

4.2 The Pure case of Political Instability and Polarisation Revisited

As above, I start with the case where the only possible source of contention between I and C concerns the aggregate amount of the goods to be produced. Accordingly, the cut-off rate for the fixed cost is[30]

$$(11)\overline{F}_p^{**} = \sigma\left[\omega^{1-\alpha^I} - 1\right] + [1-\sigma]\left[p(F)\omega^{1-\alpha^I} - p(0)\right].$$

[26] This sort of link is embedded in the models developed by Milesi-Ferretti and Spolaore (1994) and de Wolff (1996), for example.

[27] In technical terms, the model would then be a signalling game. In the context of elections, Rogoff (1990) and Alesina and Cukierman (1990) have developed models where voters are backward-looking instead of forward-looking because they would like to learn something about the incumbent's characteristics.

[28] $p(\kappa)$ might very well be I's subjective estimate of how his chances of continuing vary with his first-period choices or his relative expected performance in the second period. Note that the exact nature of this relation might depend on distributional issues. As this is not my main concern here, I take the optimal distribution of production for the two politicians to be implicit in $p(\kappa)$.

[29] The extension to more than one challenger is not as straightforward when p is endogenous, c.f. Appendix B. The reason is that any differences in $p(0)$ and $p(F)$ will then affect the cut-off rate not only through differences in outcomes between the case where I retains office and each of the challengers' regimes. Since the likelihood of these alternative regimes occurring might vary with I's decision, disparities in his pay-off across these must be considered too.

[30] Note that due to the nature of the technology, this is not an implicit definition of the cut-off level evne though F also enters on the right-hand side.

Once more, if there are no ideological rifts between incumbent and challenger, political uncertainty does not matter. For $\sigma = 1$, (11) is equal to (7). What is more interesting is the fact that for $\sigma < 1$, we cannot rule out the possibility that $\overline{F}_p^{**} > \overline{F}^*$! That is, it is now possible for political uncertainty to generate stronger incentives for reform than certain "re-appointment", c.f. Proposition 3:

Proposition 3 *For* $\sigma < 1$, $\exists \widetilde{p} \in (p(0), 1)$ *such that 1) for* $p(F) < \widetilde{p}$, $\overline{F}_p^{**} < \overline{F}^*$ *and* $\frac{\partial \overline{F}_p^{**}}{\partial \sigma} > 0$; *2) for* $p(F) > \widetilde{p}$, $\overline{F}_p^{**} > \overline{F}^*$ *and* $\frac{\partial \overline{F}_p^{**}}{\partial \sigma} < 0$.

Since $\omega^{1-\alpha^I} > 1$, we can have $\overline{F}_p^{**} > \overline{F}^*$ if and only if $p(F) >> p(0)$. In other words, there must be a strictly positive increase in the probability of continuing in office for I's investment incentives to be stronger under political uncertainty than in the benchmark case. This is why we observed in subsection 3.2 that political uncertainty worked against spending on productivity-enhancement in the production of Y. That situation can be seen to be equivalent to a special case of the one considered here, namely $p(0) = p(F) < 1$. Both when the probability of retaining office is exogenous and when it is the same regardless of the value of κ, investment has only one distinct effect, which is to increase the second-period productivity of funds spent on Y. On the other hand, when $p(\kappa)$ is a strictly increasing function of κ, investment has a second positive effect. Increases in the probability of retaining office works to the incumbent's advantage whenever the challenger has preferences which are different from his own. The more they differ, the greater is the beneficial effect of an increase in p and thus of investing.

Naturally, the required gap between $p(F)$ and $p(0)$ is not independent of the other parameters of the model. It can be seen that as $\overline{v}$ (and thus ω) or α^I goes up, the increase in the probability of retaining office that is necessary to make investment-incentives stronger under political uncertainty goes down.[31] The intuition is best grasped by observing that in the limit, as $\overline{v}$ tends to $\underline{v}$ or α^I tends to 1, there either are no productivity gains to be had or I does not care about them. Hence, the only remaining incentive to invest stems from increases in p because such increases improve the likelihood of I's optimal input mix prevailing in period 2.

Depending on the same condition that determines whether or not $\overline{F}_p^{**}$ exceeds $\overline{F}^*$, greater ideological distance between I and C strenghtens or weakens the incentive to invest. As long as $p(F) > \widetilde{p}$, the spur to invest is greater for large differences in preferences between I and C. On the other hand, if $p(F) < \widetilde{p}$ the result of sub-section 3.2 is replicated here: the cut-off rate is lower the lower σ is. If someone wanted to increase the likelihood of investment but was unable to do anything about the technology (e.g. lower F), he would be better off if he could make the incumbent's prospects of staying on uncertain as long as the

[31] An equivalent way of demonstrating these effects is to differentiate $\widetilde{p}$ with respect to these parameters. In Appendix A, I show that the signs of these derivatives are $\frac{\partial \widetilde{p}}{\partial \overline{v}} > 0$ and $\frac{\partial \widetilde{p}}{\partial \alpha^I} < 0$.

bonus from paying F in the form of a higher probability of keeping his position could be made large enough.

In situations where it is expected performance in office in the next period that is crucial to the incumbent's possibilities for staying put, one might speculate that investment would increase (decrease) p if α^I is lower (higher) than α^C. The increase in the period 2 production of Y caused by investment is $\left(1-\alpha^i\right)\left(\overline{v}-\underline{v}\right)$ for politician i. Hence, it is higher the greater the weight i attaches to the level of output of Y. As the production of X is invariant across $\kappa=0$ and $\kappa=F$ for both politicians, the one with a "comparative advantage" in the production of Y should be the one that gains the most from investment. Conversely, if performance in period 1 determines p, this is likely to make $p(0)-p(F)$ positive, at least if signalling concerns the innate productivity of the incumbent. The more productive he is, the weaker the need for investing in productivity-enhancing measures other things being equal. Upon seeing $\kappa=0$, observers might then rationally be able to infer that the incumbent is likely to be highly productive. This should strenghten his chances of staying in office. On the other hand, if what is unknown to outsiders are the preferences of the incumbent, the same signal could imply that he does not care much about good Y. Whether this would increase or decrease p would of course depend on how well his preferences are aligned with those of individuals who have an influence on p.

4.3 Distributional Conflict Revisited

If being in office benefits the incumbent over and above the gain from controlling aggregate levels of production - $\delta^{hI}<1$ for at least one h - the cut-off level is

$$
\begin{aligned}
(12)\overline{F}_p^{***} \quad = \quad & \sigma\left[\delta^{XI}\right]^{\alpha^I}\left[\delta^{YI}\right]^{1-\alpha^I}\left[\omega^{1-\alpha^I}-1\right] \\
& +\left[1-\sigma\left[\delta^{XI}\right]^{\alpha^I}\left[\delta^{YI}\right]^{1-\alpha^I}\right]\left[p(F)\omega^{1-\alpha^I}-p(0)\right].
\end{aligned}
$$

It is immediate that, as in the last sub-section, political uncertainty might actually boost reform incentives if undertaking the investment creates a large enough increase in the probability of surviving in office. In fact, the condition is identical. Therefore, changes in the ideological "distance" between incumbent and challenger work in the same way here (assuming both δ^{XI} and δ^{YI} are positive). As the effect of changes in each δ^{hI} is similar to the effect of changes in σ, the comparative statics are similar if σ, δ^{XI}, and δ^{YI} are all positive. If the increase in p from paying F is large enough to overcome the adverse effect of political uncertainty, a greater divergence of preferences over distribution or aggregate production works towards making it more likely that the reform is carried out. On the other hand, if $p(F)-p(0)$ is negative or positive but "small", lower values of σ, δ^{XI}, and δ^{YI} all imply a lower cut-off rate.

5 Public Sector Institutions and Economic Growth

The model presented here can also be viewed as contributing to the theoretical micro-foundations for the negative empirical effect of political instability on savings, investment, and growth.[32] There are several existing theories (not mutually exclusive) about these links. They have in common a focus on the behaviour of private sector agents. That is, they seek to explain why potential political instability might reduce for example private investment and thereby lower growth. A a lower probability of continuing in office works like a reduction in the discount factor, a potential for political upheaval could weaken the incentives for the government to build or keep a reputation for not expropriating private wealth. Or, as implied by the models discussed in section 2, instability could result in policies that generate inefficiencies: excessive borrowing induces expectations of higher future taxes, an inefficient tax system creates distortions that lowers the returns to investment, and so on. In a dynamic perspective, such inefficiencies could be harmful to economic growth.

A second type of link stems from the simple fact that potential political instability generally implies uncertainty about future policies (it is almost, but not quite, a tautology). When investment is irreversible, this will induce private investors to postpone investment and instead channel their resources abroad or into "unproductive" assets such as foreign currency or precious metals or simply consume them. Thirdly, potential political upheaval at the level of government often goes together with social unrest such as demonstrations, riots, or political violence, which could detrimentally affect the productivity of labour and capital or reduce the supply of these inputs. One consequence of lower productivity is lower returns to investment.

However, while the multifaceted impact of instability in the political sphere on the incentives for private accumulation is indeed important, one should not overlook the fact that so might be the impact on the behaviour of public sector decision-makers. As has been demonstrated above, political instability might weaken the incentives to take actions that will increase public sector productivity in the future and to invest resources today so as to be able to produce new kinds of goods and services in the public sector tomorrow. It is obvious that the efficiency with which the government is run will affect the private sector. Other things being equal, lower public sector efficiency implies that more resources will have to be transferred from the private sector in order to generate a given level of activity or that less can be done with a given amount of resources. The first is bad no matter the impact of governmental activity on the private sector. The second outcome has a negative effect on the private sector to the extent that public sector output contributes positively to the productivity of the private sector.[33] Infrastructure is one example of such productive govern-

[32] See e.g. Alesina and Perotti (1996) and Alesina et.al. (1996).

[33] On the effects of public expenditures and taxation in endogenous growth models, see e.g. Barro and Sala-i-Martin (1992) and Corsetti and Roubini (1996). In the traditional neoclassical model of growth, (changes in) governmental output will only affect growth along the transition path from one steady-state to another. Still, this effect might be quantitatively

mental output.[34] Another is protection of property rights.[35] If these goods and services are not forthcoming because no politician finds it in his interest to ensure their supply or output is lower than it needs to be because incentives for productivity-enhancing measures are weak or non-existent in the public sector, private investment and growth will suffer.

These effects can be sizeable. For example, Mauro (1995) finds that an increase in his index of "bureaucratic efficiency" by one standard-deviation (i.e., and improvement in efficiency) would increase the average share of private investment in GDP for the period 1970-85 by about 4.3%.[36] That is, a country in his cross-section which had an index value one standard-deviation higher than the sample mean should have had a 4.3% higher average share of private investment in GDP over this period than a country with average bureaucratic efficiency. Such an efficiency differential would produce large differences in growth rates. This is reflected in Mauro's growth regressions: the same exercise yields a 0.6% increase in average annual growth in per capita GDP over the period 1960-85.[37] Two countries having the same GDP per capita at the start of the period but differing in bureaucratic efficiency to this extent would thus find that the most efficient country would have a level of income per capita 16% higher than the other country at the end of the period.[38] However, as shown above, reform incentives might be too strong as well, implying that the trade-off between current and future output will be tilted too heavily towards the latter; or, in a dynamic model with endogenous total budgets, that the tax level will be too high because of the need to finance a continuous process of reform. Clearly, it is important to understand how potential political instability and polarisation affect the political calculus of public sector institutional development. I plan to pursue the implications of these issues for economic growth in future work.[39]

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important if the speed of transition is slow. And fiscal policy is a determinant of the steady-state level of income, which is not exactly unimportant either.

[34] Evidence on the positive effect of public infrastructure investment is presented in Easterly and Rebelo (1993).

[35] See the work of North (1981, 1990) for theoretical arguments and historical examples of how variations in the protection of property rights and enforcement of contracts affect economic development.

[36] Table V, page 697. This table contains simple regressions of various measures of investment on his indices of corruption, bureaucratic efficiency, and institutional efficiency.

[37] Table VII, pages 702-703. The number referred to stems from a simple regression of the independent variable on his bureaucratic efficiency index. The effect is larger for some of the other regressions (where more variables are included). The reason why I refer to numbers that pertain to two different time periods is that the author only produces regression results for private investment for the shorter period and for growth for the longer period.

[38] Similarly, as demonstrated by Knack (1996) and Keefer and Knack (1997), the ability of poor countries to catch up with richer ones in terms of income is significantly affected by the quality of their public sector institutions. Also see Knack and Keefer (1995) for more econometric evidence on the importance of efficient political and administrative institutions for economic growth.

[39] After the first versions of this paper were completed, a paper by Svensson (1998) was brough to my attention. He endogenises the political decision on the degree of protection of private property rights in a two-period model with private investment. The choice of the fraction of the returns to investment in the formal sector that private investors will be able to keep is continuous and possibly costly. The two potential governments derive benefits from

6 Final Remarks and Conclusions

6.1 Individual versus Collective Political Decision-Making

The logic outlined above applies not only to the bureaucracy or the executive branch more generally. Reforms of the judiciary, say to speed up the processing of cases or root out corruption, is another important class of institutional changes that is likely to suffer the effects of potential political instability and political polarisation. The same goes for changes in political institutions, e.g. budget institutions. Such institutions regulate the relationship between spending ministries and the Treasury and between the government and the legislature, and include both laws and procedural rules. Devising optimal changes necessitates spending on planning and implementation, but potential gains will not materialise until these stages have been completed.

Changes in institutions such as these will usually involve many actors. While the process by which a conclusion is drawn will of course be different, there is no reason to believe that this will change the nature of the benefits and costs of reforms in a manner which will make their undertaking more likely. It is of course immediate that if collectives are treated as single units as in models of competition between single-party governments, the situation is completely analogous to the situation modelled here.[40]

If anything, modelling collective decision-making explicitly should strengthen the main conclusion of this paper about the disincentives to reform created by potential political instability. The reason is that the benefits are likely to be diluted in the process of reform or that the consequences of political instability might be more dramatic than in the formal model presented above. For example, in majoritarian parliamentary systems, a government investing in the creation of organisations which are to produce goods and services which its supporters value highly might find that a change of government will lead to the dissolution of these organisations or that a new government will have them produce output the supporters of the former government do not value as much. In the context of considerable political polarisation such changes in mandates might approach equivalence with dissolution. In proportional representation systems, which often produce coalition or minority governments, and separation-of-powers systems gathering the requisite support for a reform might require compromises

both private consumption and public goods. The form of the utility of public goods function is less general than the one employed here (it is linear with inversely symmetric weights), and there is disagreement between the two government types over the spending pattern in period 2 only (the representative private agent only cares about total public sector output). Finally, the probability of losing office is exogenous. Svensson tests the implications of his model using the same institutional variables as in the Knack and Keefer papers cited above, and finds negative effects of political instability and polarisation on public sector institutional quality and total investment in his sample. I think his theoretical and empirical results support the idea of developing the framework used in this paper into a full-fledged political economy of growth model.

[40] Other examples are median legislator models or legislative committee member models where the preferences of some legislator situated strategically in the decision-making process are decisive for the outcome produced.

with other politicians. It should be readily apparent that such compromises cannot increase the benefits that the supporters of the reform receive and that in most cases they will be reduced. There is no reason to believe that a corresponding reduction results on the cost side of the balance sheet.[41]

Of course, this does not mean that there are no mechanisms that work towards increasing political reform incentives. One obvious example is the majoritarian impetus towards collectivising the costs of public programmes while concetrating their benefits.[42] Thus, if groups that are not important to incumbents politically or personally can be made to pay for reforms to some extent, their adoption becomes more likely.[43] The point I am trying to make is simply that collective political decision-making should be as likely to be influenced by political instability and polarisation as the calculus of individual politicians empowered with the right to decide on reforming some public sector institution. To determine whether net reform incentives are too strong or too weak in any specific instance, one would require both an explicit model of the relevant institutions and a normative benchmark.

6.2 Conclusions

In this paper, I have demonstrated the potentially adverse effects of political instability and polarisation on public sector institutional development. If the probability of staying in office is unaffected by the incumbent's investment decision, political instability increases the hurdle that has to be surpassed for such resource-use to be optimal. The adverse effects are aggravated by political polarisation in various forms, and the disincentive generated by polarisation is larger the greater the disagreement between incumbent and challenger. Only if the relationship between political uncertainty and reforms is such that investment significantly raises the probability of staying in power will such uncertainty be conducive to reforms. The reason is that the gain from an increase in the probability of retaining office then outweighs the direct negative effect of the presence of political uncertainty. If this is the case, political polarisation will actually spur investment.

It should be possible to test these predictions econometrically at the government level using the indices of institutional efficiency employed by Mauro (1995), Keefer and Knack (1997), and others and estimating political instability along the lines of Alesina et.al. (1996). The latter paper uses a simultaneous equation approach to test whether growth is affected by instability and whether growth feeds back to instability. This is how one ideally would go about testing the model presented here given the potential for two-way causation. On the

[41] On some differences between separation-of-powers and parliamentary systems with respect to the political choice of administrative structures and processes, see Moe (1990) and Moe and Caldwell (1994).

[42] See e.g. Weingast, Shepsle, and Johnsen (1981), Shepsle and Weingast (1984), and Baron (1991).

[43] A crude way of capturing this in the present model would be to let the incumbent pay a share of the costs of reform $\pi \in [0, 1]$. It is easy to demonstrate that this will inflate all cut-off rates by $\frac{1}{\pi}$.

other hand, if one is interested in investigating the consequences of micro-level political uncertainty on specific public sector institutions, one would probably have to contend oneself with case studies.

That risk-averse investors respond negatively to uncertainty about the returns to investment is well-known.[44] In this paper I have pointed out that such effects are present in the public sector as well even though politicians do not enjoy property rights over those institutions. Uncertainty about control rights generates the same kind of consequences. Moreover, it interacts with political disagreement between politicians who compete for the same office, a factor not present in the calculus of private investors. The model presented here also demonstrates the possibility of reversing the impact of insecure returns to investment, a less obvious result. This can happen when investment influences the probability distribution of its "returns". It is difficult to come up with examples of a similar effect in the context of private investment decisions.[45]

While the model is simple, I believe that the issue discussed here is important because uncertainty is an integral part of every political environment no matter its formal characteristics. Furthermore, there is no reason to expect that constructing more elaborate models would change the main conclusions drawn here. That is, when viewed in isolation, political instability and polarisation should generate predictions about reform efforts similar to those derived above even if for instance the probability of retaining office is endogenised. Of course, other features of political and administrative institutions might work to counteract these effects. And my results do indicate that the details of political institutions could be important as potential political change and ideological disagreement can have quite different effects depending on how responsive the likelihood of continuing in office is with respect to reform. Thus, more specific models are worth pursuing.

The word reform has positive connotations. Furthermore, in this paper I have spoken about the disincentives to reform generated by political uncertainty while noting that in some cases we might see "over-investment" compared to the benchmark of no potential for upheaval. Therefore, by way of conclusion, let me emphasise that the results obtained here should not be interpreted in a normative manner. For instance, while my model predicts that in conditions of political uncertainty, when combined with political polarisation of various forms, there might be comparatively fewer reforms of public sector institutions relative to more stable environments, in and of itself this need not be a bad thing. Reforms do not have to constitute an improvement compared to some status quo when evaluated according to a normative theory such as welfare economics. For example, when reforms are sought for purely partisan purposes,

[44] For a good discussion of how variations in property rights - both in degree and kind - can affect private incentives to invest in land, see Besley (1995).

[45] However, the analogy to private sector firms in which ownership and control are separated, i.e., some control rights are delegated to managers, is rather straightforward with respect to the effect of uncertainty about control rights. For example, such uncertainty might deter managers from making relation-specific investments in their own human capital for which the return depends on them continuing in charge of the company.

say to benefit some constituency of the politicians in power, overall welfare need not improve. Polarisation of preferences might then result in public sector institutions serving purposes which are at odds with the goals of a large part of the citizenry. If power does change hands rapidly, a sizeable share of the resources commanded by the public sector might be wasted on undoing the administrative reforms of the previous governments and putting up structures and procedures to serve the current office-holders. By reducing the gains from reforms and thus the incentives to engage in the restructuring of institutions created by past decision-makers, political uncertainty might actually be welfare-improving. It goes without saying that the conclusion would be the opposite if inefficient institutions prevail because would-be reformers are not certain that the benefits they see will be realised in the future.[46] Hence, the merits of (non-)reform must be judged in the context of concrete cases.

7 Appendices

7.1 Appendix A: Proofs of Claims and Results in the Main Text

I first prove that the optimal budget shares for the two goods are indeed equal to their weights in the objective function of a politician. Incorporating the budget constraint in the objective function and utilising the definitions $\delta^{Xi}(i) = \delta^{Yi}(i) \equiv 1$, the choice problem of the politician in office in period t becomes

$$(A1) \underset{b_t^X}{Max} U^i(Q_t; i) = \left\{\chi b_t^X\right\}^{\alpha^i} \left\{g\left(K_t^Y\right)\left[R_t - b_t^X\right]\right\}^{1-\alpha^i};$$

where R_t is the share of resources left for production in period t after any fixed cost of reform has been paid. Hence, $R_2 = 1$ and $R_1 = 1 - \kappa$. The first-order condition for a maximum is thus

$$\begin{aligned}(A2) \frac{\partial U^i(Q_t; i)}{\partial b_t^X} &= \alpha^i \left\{\chi \widehat{b}_t^{Xi}\right\}^{\alpha^i - 1} \left\{\chi g\left(K_t^Y\right)\left[R_t - \widehat{b}_t^{Xi}\right]\right\}^{1-\alpha^i} \\ &\quad - \left\{\chi \widehat{b}_t^{Xi}\right\}^{\alpha^i} \left[1 - \alpha^i\right] \left\{g\left(K_t^Y\right)\left[R_t - \widehat{b}_t^{Xi}\right]\right\}^{-\alpha^i} g\left(K_t^Y\right) \\ &= 0.\end{aligned}$$

The solution to $(A2)$ is $\widehat{b}_t^{Xi} = \alpha^i R_t$, from which it follows that $\widehat{b}_t^{Yi} = \left[1 - \alpha^i\right] R_t$. Hence the claim is substantiated.

[46] Even if we see the normative issue as being the maximisation of some function defined over the objective functions of I and C, ignoring the potential for political instability, the benchmark we have used for comparison would not be the right one because it is based on the arbitrary identity of the incumbent (except in the degenerate case where the "welfare" function is identical to I's objective function).

We now turn to the properties of $\sigma(\alpha^C)$. As property 1) ($\sigma(\alpha^I) = 1$) and property 3) ($\lim_{\alpha^C \to 0} \sigma(\alpha^C) = \lim_{\alpha^C \to 1} \sigma(\alpha^C) = 0$) are immediate from (9) in the main text, I will only prove property 2), i.e., $\sigma(\alpha^C) < 1, \alpha^C \neq \alpha^I$. Differentiating (9), we get

$$(A3)\frac{\partial \sigma(\alpha^C)}{\partial \alpha^C} = \frac{\alpha^I [\alpha^C]^{\alpha^I - 1} [1-\alpha^C]^{1-\alpha^I} - [\alpha^C]^{\alpha^I} [1-\alpha^I] [1-\alpha^C]^{-\alpha^I}}{[\alpha^I]^{\alpha^I} [1-\alpha^I]^{1-\alpha^I}}$$
$$= \sigma(\alpha^C) \left[\frac{\alpha^I}{\alpha^C} - \frac{1-\alpha^I}{1-\alpha^C}\right].$$

Accordingly,

$$(A4) sign \frac{\partial \sigma(\alpha^C)}{\partial \alpha^C} = sign \left[\frac{\alpha^I}{\alpha^C} - \frac{1-\alpha^I}{1-\alpha^C}\right] = sign \left[\alpha^I - \alpha^C\right].$$

Thus, $\alpha^C = \alpha^I$ is an extremum of this function. The second derivative of $\sigma(\alpha^C)$ is

$$(A5)\frac{\partial^2 \sigma(\alpha^C)}{\partial [\alpha^C]^2} = \frac{\alpha^I [\alpha^I - 1] [\alpha^C]^{\alpha^I - 2} [1-\alpha^C]^{1-\alpha^I} - 2\alpha^I [1-\alpha^I] [\alpha^C]^{\alpha^I - 1} [1-\alpha^C]^{-\alpha^I}}{\left\{[\alpha^I]^{\alpha^I} [1-\alpha^I]^{1-\alpha^I}\right\}^2}$$
$$- \frac{\alpha^I [1-\alpha^I] [\alpha^C]^{\alpha^I} [1-\alpha^C]^{-\alpha^I - 1}}{\left\{[\alpha^I]^{\alpha^I} [1-\alpha^I]^{1-\alpha^I}\right\}^2}.$$

Because $\alpha^I \in (0,1)$, this expression is strictly negative for all α^C. In particular, it is negative at $\alpha^C = \alpha^I$, proving that it is indeed the maximum of $\sigma(\alpha^C)$. As $\sigma(\alpha^C) = 1$, the proof has been completed.

As for the proof of Proposition 1, Parts 1 and 2 are clear from inspection of (7) and (8) in the main text. Parts 3 and 4 are obtained by differentiating (8) with respect to $\sigma(\alpha^C)$ and p:

$$(A6a)\frac{\partial \overline{F}^{**}}{\partial \sigma(\alpha^C)} = [1-p]\left[\omega^{1-\alpha^I} - 1\right] > 0 \ \forall p < 1;$$
$$(A6a)\frac{\partial \overline{F}^{**}}{\partial p} = \left[1 - \sigma(\alpha^C)\right]\left[\omega^{1-\alpha^I} - 1\right] > 0 \ \forall \sigma(\alpha^C) < 1.$$

Q.E.D.

Turning to Proposition 2, parts 1 and 2 can be derived by comparing (10) in the main text with (7) and (8) respectively. To complete the proof, I thus only have to demonstrate that Part 3) is correct. Differentiating (10) with respect to $\delta^{hI}(C)$, one gets

$$(A7)\frac{\partial \overline{F}^{**}}{\partial \delta^{hI}(C)} = \begin{cases} [1-p]\,\sigma\left(\alpha^C\right)\alpha^I\left[\delta^{XI}(C)\right]^{\alpha^I-1}\left[\delta^{YI}(C)\right]^{1-\alpha^I}\left[\omega^{1-\alpha^I}-1\right], h=X; \\ [1-p]\,\sigma\left(\alpha^C\right)\left[\delta^{XI}(C)\right]^{\alpha^I}\left[1-\alpha^I\right]\left[\delta^{YI}(C)\right]^{-\alpha^I}\left[\omega^{1-\alpha^I}-1\right], h=Y. \end{cases}$$

Each of these are greater than zero as long as $p<1$ and $\sigma\left(\alpha^C\right)$ and the other $\delta^{hI}(C)$ are both greater than zero. Q.E.D.

To prove Proposition 3, first note that from (7) and (11) in the main text

$$(A8)\overline{F}_p^{**}-\overline{F}^{*}=\left[1-\sigma\left(\alpha^C\right)\right]\left\{[1-p(0)]-[1-p(F)]\,\omega^{1-\alpha^I}\right\}.$$

Thus, for $\sigma\left(\alpha^C\right)<1$ we have $sign\left[\overline{F}_p^{**}-\overline{F}^{*}\right]=sign\left\{[1-p(0)]-[1-p(F)]\,\omega^{1-\alpha^I}\right\}$. It follows that in order to get $\overline{F}_p^{**}>\overline{F}^{*}$, we must have $\frac{1-p(0)}{1-p(F)}>\omega^{1-\alpha^I}$. Hence, for $p(F)>1-\left[\frac{1-p(0)}{\omega^{1-\alpha^I}}\right]\equiv\widetilde{p}$, the first result in part 2) of Proposition 3 is obtained. From (11) in the main text $\frac{\partial \overline{F}_p^{**}}{\partial\sigma(\alpha^C)}=-\left\{[1-p(0)]-[1-p(F)]\,\omega^{1-\alpha^I}\right\}$, which means that $sign\frac{\partial \overline{F}_p^{**}}{\partial\sigma(\alpha^C)}=-sign\left\{[1-p(0)]-[1-p(F)]\,\omega^{1-\alpha^I}\right\}$, proving the second result. Part 1) is the reverse case. Because $1<\omega^{1-\alpha^I}<\infty$, $p(0)<\widetilde{p}<1$. Q.E.D.

The effects of changes in $\overline{v}$ and α^I on $\widetilde{p}$ can be found by differentiating the definition. After cancelling terms one gets

$$(A9a)\frac{\partial\widetilde{p}}{\partial\overline{v}} = \frac{\left[1-\alpha^I\right][1-p(0)]}{\overline{v}\omega^{1-\alpha^I}}>0;$$

$$(A9b)\frac{\partial\widetilde{p}}{\partial\alpha^I} = -\frac{[1-p(0)]\ln\omega}{\omega^{1-\alpha^I}}<0.$$

7.2 Appendix B: Generalisations

If we allow for a more general specification of the technology, i.e., $X_t=\left[f\left(K_t^X\right)\right]^{\zeta^X}\left[b_t^X\right]^{\phi^X}$ and $Y_t=\left[g\left(K_t^Y\right)\right]^{\zeta^Y}\left[b_t^Y\right]^{\phi^Y}$, where $\zeta^h,\phi^h\in(0,1]$, $h=X,Y$, the results do not change qualitatively. We have $\widehat{b}_t^{Xi}=\beta^i R^t$, $\beta^i=\frac{\alpha^i\phi^X}{\alpha^i\phi^X+[1-\alpha^i]\phi^Y}$, and $\widehat{b}_t^{Yi}=\left[1-\beta^i\right]R_t$ for politician i. The model used in the main text is simply the special case $\zeta^h=\phi^h=1$, $h=X,Y$. As technological differences between the transformation processes for the two goods are not particular interesting for our purposes, let $\zeta^X=\zeta^Y\equiv\zeta$ and $\phi^X=\phi^Y\equiv\phi$. Then $\beta^i=\alpha^i$. The most general expression for the cut-off rate is then

$$(B1)\widetilde{F} = 1 - \left\{1 - \left\{\psi^I \left[\omega^{\zeta[1-\alpha^I]} - 1\right] + \left[1 - \psi^I\right]\left[p(F)\,\omega^{\zeta[1-\alpha^I]} - p(0)\right]\right\}\right\}^{\frac{1}{\phi}}.$$

where $\psi^I = \left[\delta^{XI}(C)\right]^{\alpha^I}\left[\delta^{YI}(C)\right]^{1-\alpha^I}\mu(\alpha^C)$ and

$$(B2)\mu(\alpha^C) = \frac{[\alpha^C]^{\phi\alpha^I}\left[1-\alpha^C\right]^{\phi[1-\alpha^I]}}{[\alpha^I]^{\phi\alpha^I}\left[1-\alpha^I\right]^{\phi[1-\alpha^I]}}$$

is the measure of preference similarity between incumbent and challenger in this case. As $\mu(\alpha^C) = [\sigma(\alpha^C)]^{\phi}$, it should be readily apparent that the qualitative properties of these measures are identical.[47] Furthermore, inspection of $(B1)$ reveals that even though the form of the cut-off rate is more complicated than in the special case discussed in the main text, the comparative statics remain similar (compare (14) in the main text). One only has to be a little more careful in specifying parameter values in order to ensure that the cut-off rate is non-negative and not greater than 1 so that corner solutions where it is never or always optimal to invest are ruled out.

If $f(K_t^X) = K_t^X$ and $g(K_t^Y) = K_t^Y$, productivity is a continuous function of the "capital stock". It is possible to demonstrate that in the case of exogenous political uncertainty the optimal investment in production of Y has the same qualitative properties as the cut-off rates. After some simplifications, the first-order condition becomes

$$\begin{aligned}(B3)S(\kappa) &\equiv \phi\left[K_1^Y\right]^{\phi[1-\alpha^I]}[1-\kappa]^{\phi-1} \\ &= \left[1-\alpha^I\right]\zeta\left\{p + [1-p]\,\mu(\alpha^C)\left[\delta^{XI}(C)\right]^{\alpha^I}\left[\delta^{YI}(C)\right]^{1-\alpha^I}\right\}\left[K_1^Y + \kappa\right]^{\zeta[1-\alpha^I]} \\ &\equiv T\left(\kappa, p, \mu(\alpha^C), \delta^{XI}(C), \delta^{YI}(C)\right)\end{aligned}$$

(assuming it is not possible to invest in the productivity of budgetary funds allocated to good X production). Applying the implicit function theorem, the derivatives of optimal investment with respect to the parameter z can be seen to be

$$(B4)\frac{d\kappa}{dz} = -\frac{\frac{\partial T}{\partial z}}{\frac{\partial T}{\partial \kappa} - \frac{\partial S}{\partial \kappa}}.$$

[47] In the more general case where possibly $\phi^X \neq \phi^Y$, it can be shown that $\alpha^C = \alpha^I$ is an extremum of the measure. However, it is more difficult to establish whether the second-order condition for a maximum holds at this point.

The numerator on the right-hand side is negative (this is the second-order condition for an optimum, which can be shown to be fulfilled). It follows that $sign\frac{d\kappa}{dz} = sign\frac{\partial T}{\partial z}$. Inspection of (B3) then reveals that the comparative statics with respect to p, $\mu\left(\alpha^C\right)$, $\delta^{XI}(C)$, and $\delta^{YI}(C)$ are qualitatively indistinguishable from the comparative statics of the cut-off rates in the main text with respect to the same parameters. Thus political polarisation and uncertainty have the same kind of effects on investment incentives in this case. When p is endogenous, one has to make assumptions about the functional relationship between p and κ in order to establish the characteristics of optimal investment.

If the assumption that the investment choice is discrete is retained while making the productivity of budgetary funds allocated to good h a function of the overall "capital stock" so that investment increases the productivity of funds in the production of both goods, i.e.,

$$\begin{aligned}
(B5a) f(K_1) &= \underline{\chi} > 0 \\
(B5b) f(K_2) &= f(K_1+\kappa) = \begin{cases} \underline{\chi}\ if\ \kappa = 0, \\ \overline{\chi} > \underline{\chi}\ if\ \kappa = F. \end{cases}; \\
(B5c) g(K_1) &= \underline{v} > 0; \\
(B5d) g(K_2) &= g(K_1+\kappa) = \begin{cases} \underline{v}\ if\ \kappa = 0, \\ \overline{v} > \underline{v}\ if\ \kappa = F. \end{cases};
\end{aligned}$$

the resulting cut-off rates have the same qualitative properties as in the main text, the only change being that $\varkappa^{\alpha^I}\omega^{1-\alpha^I}$, $\varkappa = \frac{\overline{\chi}}{\underline{\chi}}$, $\omega^{1-\alpha^I}$ replaces everywhere. It can be seen that this substitution leaves the conclusions unchanged. Thus, studying "comprehensive" institutional reforms yields the same type of results as do the analysis of "partial" reforms.

The remainder of this appendix is devoted to proving that the results generalise to the case where the incumbent faces more than one challenger. For this exercise, I stick to the formulation of the technology utilised in the main text. Let there be $L \geq 3$ politicians (indexed by l) competing for the office in question. That is, there are $L-1$ challengers and one incumbent (politician L). All politicians have Cobb-Douglas preferences over the two goods identified by $\alpha^l \in (0,1)$. Hence, their optimal period 2 choices are of the form shown above. Towards demonstrating the result, it is useful to rewrite equation (6) in the main text in its most general form:

$$\begin{aligned}
(B6) V^L(\kappa) &= \left\{\chi\alpha^L[1-\kappa]\right\}^{\alpha^L}\left\{\underline{v}\left[1-\alpha^L\right][1-\kappa]\right\}^{1-\alpha^L} \\
&\quad + \sum_{l=1}^{l=L} p^l(\kappa)\left\{\delta^{XL}(C)\chi\alpha^l\right\}^{\alpha^L}\left\{\delta^{YL}(C)\, g\left(K_1^Y+\kappa\right)\left[1-\alpha^l\right]\right\}^{1-\alpha^L}.
\end{aligned}$$

Of course, $\sum_{l=1}^{l=L} p^l(\kappa) = 1$ for each value of κ. By equating $V^L(0)$ and $V^L(F)$, the following general expression for the cut-off level can be derived:

$$(B7)\widehat{F} = \sum_{l=1}^{l=L} \left[\delta^{XL}(l)\right]^{\alpha^L} \left[\delta^{YL}(l)\right]^{1-\alpha^L} \sigma\left(\alpha^l\right) \left[p^l(F)\,\omega^{1-\alpha^L} - p^l(0)\right].$$

$\sigma\left(\alpha^l\right)$ is defined in exactly the same manner as $\sigma\left(\alpha^C\right)$ in the main text: $\sigma\left(\alpha^l\right) = \frac{[\alpha^l]^{\alpha^L}[1-\alpha^l]^{1-\alpha^L}}{[\alpha^L]^{\alpha^L}[1-\alpha^L]^{1-\alpha^L}}$. These measures of preference similarity between the incumbent and each of his challengers therefore have exactly the same properties as $\sigma\left(\alpha^C\right)$. Trivially, $\sigma\left(\alpha^L\right) = 1$. By definition, $\delta^{XL}(L) = \delta^{YL}(L) \equiv 1$. The benchmark is derived by setting $p^L(F) = p^L(0) = 1$. It is the same as in the case of a single challenger. "Pure" political polarisation results when $\delta^{XL}(l) = \delta^{YL}(l) = 1\ \forall l$, $p^l(F) = p^l(0) \equiv p^l\ \forall l$, and $p^L < 1$. If the incumbent's constituency broadly defined differs from that of any of his challengers, $\delta^{hL}(l) < 1$ for at least one h and one $l < L$. Endogenous political uncertainty is studied by letting $p^l(F) \neq p^l(0)$ for at least two ls (as the probabilities must sum to one for each value of κ, whenever $p^l(F) \neq p^l(0)$ for one politician, $p^l(F) \neq p^l(0)$ for at least one other too). It is easily seen that when the probabilities of winning office in period 2 are exogenous, the case $L-1 > 1$ adds only one really new featured compared to the case $L-1 = 1$. $(B7)$ then becomes

$$(B8)\widehat{F} = \sum_{l=1}^{l=L} \left\{ \left[\delta^{XL}(l)\right]^{\alpha^L} \left[\delta^{YL}(l)\right]^{1-\alpha^L} \sigma\left(\alpha^l\right) p^l \right\} \left[\omega^{1-\alpha^L} - 1\right].$$

In this case, increased polarisation of preferences between the incumbent and one of the challengers always reduces the cut-off level as do greater differences in the way in which they distribute the goods. $\frac{\partial \widehat{F}}{\partial \sigma(\alpha^l)}$, $\frac{\partial \widehat{F}}{\partial \delta^{XL}(l)}$, and $\frac{\partial \widehat{F}}{\partial \delta^{YL}(l)}$ are all weakly positive for $l < L$ (strictly positive as long as $\delta^{XL}(l)$, $\delta^{YL}(l)$, $\sigma\left(\alpha^l\right)$, and p^l are all strictly positive). To see the effect of changes in the probabilities of winning office, let us rank all ls in descending order according to the value of $\left[\delta^{XL}(l)\right]^{\alpha^L} \left[\delta^{YL}(l)\right]^{1-\alpha^L} \sigma\left(\alpha^l\right)$. As this expression by definition equals 1 for the incumbent, he ranks first. Then $\frac{\partial \widehat{F}}{\partial p^l} = \left\{ \left[\delta^{XL}(l)\right]^{\alpha^L} \left[\delta^{YL}(l)\right]^{1-\alpha^L} \sigma\left(\alpha^l\right) - \left[\delta^{XL}(m)\right]^{\alpha^L} \left[\delta^{YL}(m)\right]^{1-\alpha^L} \sigma\left(\alpha^m\right) \right\} \left[\omega^{1-\alpha^L} - 1\right]$ is non-negative for $l > m$ and non-positive for $l < m$ $(l \neq m)$. If no two ls are identical, $l > m$ $(l < m)$ implies that this derivative is strictly positive (negative). Hence, an increase in p^L is bound to increase the cut-off rate no matter which challenger's probability of winning is negatively affected. If the probability of a challenger winning changes, the cut-off rate increases if this challenger has preferences (widely defined) closer to the incumbent's preferences than the one whose chances are diminished. Conversely, if the challenger who gains has preferences that deviate more from the incumbent's preferences than the opponent whose probability of winning is reduced, the cut-off rate goes down. Thus,

the only new feature is that the ranking of the challengers in terms of preferences might matter for the comparative statics of changes in the probabilities of winning. It can be seen that if any two challengers are identical, the cut-off level is not affected by changes in their probabilities of winning as long as the sum of these remains constant. If challengers are heterogenous, investment incentives are strengthened (weakened) by changes in probabilities of winning that result in challengers whose preferences are more in line with the incumbent's preferences gaining (losing) at the expense of those whose preferences diverge more from his.

Things are slightly more complicated when p is endogenous. The reason is that as long as the first-period investment choice makes a difference to some p^ls, the effect discussed in connection with the comparative statics of changes in exogenous p^ls is incorporated into the definition of the cut-off level. For example, when $L-1=2$, i.e., $L=3$, we have

$$\begin{aligned}(B9a)\widehat{F}_p^{**} &= \left[p^3(F)\,\omega^{1-\alpha^3}-p^3(0)\right]+\sigma(\alpha^2)\left[p^2(F)\,\omega^{1-\alpha^3}-p^2(0)\right]\\ &\quad+\sigma(\alpha^1)\left\{\left[1-p^3(F)-p^2(F)\right]\omega^{1-\alpha^3}-\left[1-p^3(0)-p^2(F)\right]\right\};\\ (B9b)\widehat{F}_p^{***} &= \left[p^3(F)\,\omega^{1-\alpha^3}-p^3(0)\right]\\ &\quad+\left[\delta^{X3}(2)\right]^{\alpha^3}\left[\delta^{Y3}(2)\right]^{1-\alpha^3}\sigma(\alpha^2)\left[p^2(F)\,\omega^{1-\alpha^3}-p^2(0)\right]\\ &\quad+\left[\delta^{X3}(1)\right]^{\alpha^3}\left[\delta^{Y3}(1)\right]^{1-\alpha^3}\sigma(\alpha^1)\left\{\left[1-p^3(F)-p^2(F)\right]\omega^{1-\alpha^3}\right.\\ &\quad\left.-\left[1-p^3(0)-p^2(F)\right]\right\}.\end{aligned}$$

Rewriting $(B9a)$, we get

$$\begin{aligned}(B10)\widehat{F}_p^{**} &= \sigma(\alpha^1)\left[\omega^{1-\alpha^3}-1\right]+\left[1-\sigma(\alpha^1)\right]\left[p^3(F)\,\omega^{1-\alpha^3}-p^3(0)\right]\\ &\quad+\left[\sigma(\alpha^2)-\sigma(\alpha^1)\right]\left[p^2(F)\,\omega^{1-\alpha^3}-p^2(0)\right].\end{aligned}$$

As in section 4, political instability does not affect the cut-off rate when the challengers' preferences are identical to the incumbent's. Moreover, the analysis is also unchanged when they differ from him as long as the challengers are identical. Then the last term vanishes and $(B10)$ becomes indistinguishable from (11) in the main text. However, when they do differ, the cut-off rate will be affected in a direction which depends on whether investment increases the probability that challenger 1 wins office, which ceteris paribus reduces the probability that 2 wins office, and whether such a change is desirable to 3. That is, an increase in p^1 holding p^3 constant makes investment more desirable for 3 if 1's preferences are closer to his than 2's are. Thus, the relationship between $\widehat{F}_p^{**}$ and $\widehat{F}^*$ will be determined by both the effect on the incumbent's own chances relative to those of each rival and his political differences with them *and* on the likelihood of more or less palatable challengers winning, c.f. $(B11)$:

$$(B11) sign\left[\widehat{F}_p^{**} - \widehat{F}^*\right] = sign\left\{\left[1-\sigma\left(\alpha^1\right)\right]\left[\left[1-p^3\left(0\right)\right] - \left[1-p^3\left(F\right)\right]\omega^{1-\alpha^3}\right] + \left[\sigma\left(\alpha^2\right) - \sigma\left(\alpha^1\right)\right]\left[p^2\left(F\right)\omega^{1-\alpha^3} - p^2\left(0\right)\right]\right\}.$$

Clearly, we cannot really say much more as $p(\cdot)$ long as is not made explicit. The last case, where incumbent and challenger might also differ in the way in which they distribute X and Y, yields similar conclusions.

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Chapter 3

Political Will versus Political Power
On the Political Economy of Economic Reforms*

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Abstract

Issues of policy reform have been at the forefront of the development debate in the last couple of decades. It is increasingly acknowledged that the politics and economics of reform are inextricably intertwined. In this paper, the merits of two common but conflicting views of the political prerequisites for economic reform are analysed. According to the first view, political will is what matters. The second view holds that political power is decisive. I show that it is the first view that is correct under a fairly wide set of circumstances. Specifically, I demonstrate that governments which want to reform will do so regardless of the electoral consequences and that the result is independent of whether or not the government has unconstrained access to international credit markets.

1 Introduction

The political economy of economic policy reform has attracted a lot of attention from academics, bureaucrats, and politicians in the last decade or so.[1] The origin of this interest lies in the enormous reform challenges that the countries of what used to be called the Second and Third Worlds, that is, the former communist countries of Eastern Europe and the Soviet Union

*Many helpful discussions with Gaute Torsvik are gratefully acknowledged. I would also like to thank seminar participants at the Norwegian School of Economics and Business Administration, in particular my discussant Bertil Tungodden, for useful comments.

[1] A good review of the scholarly debate is provided by Tommasi and Velasco (1995).

and the developing countries of Latin America, Africa, and Asia, have faced. With the onset of the debt crisis, the latter group of countries suddenly faced not only the policy prescriptions of the IMF with respect to short-term macroeconomic management, which have always been politically contentious, but also increasingly insistent recommendations from the Fund, the World Bank, and bilateral aid donors about what set of policies would facilitate long-term economic development. Increasingly, such recommendations had to be at least nominally heeded if external funding (whether concessional or commercial) was to be provided. The debate on conditionality and structural adjustment in the developing countries was heated from the start, and still reverberating when the end of the Cold War suddenly threw the former communist countries into a reform process of even more far-reaching consequence than the one facing developing countries in their efforts to open up their economies and tilt the balance between state and market towards the latter.

The merits of policy conditionality in inducing actual and lasting policy changes are not too impressing.[2] This has lead some observers to emphasise the importance of "ownership" of reform programmes, i.e., that developing country governments are committed to reforms because they voluntarily choose this set of policies. A corollary of this view is that only reforms that are wanted by these governments will be chosen and sustained. Non-adoption of reforms is thus a consequence of the lack of political "will" and this kind of will is all it takes to change economic policy-making in a country.

Another common observation on economic policy reforms in developing countries is that governments of countries in seemingly identical economic positions often choose rather different policies. Economic "crisis" is frequently seen as an agent of policy change, but what constitutes a "crisis" seem to vary widely from country to country.[3] That is, some governments choose to reform while others hang on to their old ways even though the economic impetus for change looks roughly the same. While it is perhaps debatable whether there is a consensus regarding economic policies as some have argued (Williamson 1994), many economists at least broadly agree upon a number of macroeconomic, fiscal, trade, and industrial policy issues. It is then tempting - especially for economists - to argue that the procrastinators

[2]For a review of the experience with conditionality in World Bank programmes, see Mosley, Harrigan, and Toye (1991). Killick (1995) performs the same type of analysis with respect to the IMF.

[3]Krueger (1993) is among those who have commented on this phenomenon.

for some reason - whether ignorance or self-interest - lack the will to "do the right thing". However, others have countered that at least in the short run, mainstream policy prescriptions impose hardships on large sectors of the populace. Because of this, the social and political stability of poor countries adopting them will be endangered. Moreover, any change in policies harms those who have benefited from previous policies (particular with respect to trade and regulation). These "vested interests" will not stand idly by when their privileges are threatened. Indeed, in some case they will simply "veto" any change. Thus, even governments who acknowledge the need for reform will not be able to pursue such policy changes because of the negative political repercussions. In this view, "political power" is the sole determinant of reform adoption by developing country governments. And this explains why similar economic conditions do not yield similar political responses: differences in political power. Those who have it do reform, those who do not do not.

Clearly, which of these views are correct has important implications for conditionality and external financing of reform efforts.[4] As argued next, one would also expect them to make a major difference to the way in which private economic agents evaluate announcements of reforms (or the lack thereof), and thus for the successfulness of incipient reforms in inducing investment and growth. In turn, this will feed back on the political fate of the reforms.

2 Commitment and Credibility in Economic Reforms

While economic reforms are initiated, adopted, and implemented by politicians and bureaucrats, it is the response of private sector agents that determines their success in inducing economic growth. Particularly important in this regard are the reactions of investors, whether domestic or foreign. These reactions will to a large extent be determined by the credibility of the reforms. If reforms are not credible, the response of investors will be hesitant, totally lacking, or even destabilising. Investment will not be forthcoming and capital will not flow in from abroad to take opportunity of the new policies. Uncertainty about the durability of the new policy regime might even

[4] Of course, these views are not always made explicit in the literature, and for the sake of argument I have stylised them into to polarised positions.

engender macroeconomic instability. An example is speculation in durable goods imports in connection with a less than fully credible trade liberalisation. When the economy does not pick up or even deteriorates after reforms have been adopted, the short-term sacrifices that usually are required of (at least parts of) the populace will not seem worthwhile. This will jeopardise the reforms politically, and backtracking or reversals of policies might ensue. Thus, politico-economic reform circles might be vicious: if credibility is wanting, investment and growth will be disappointing, leading to a political backlash that fulfils the expectations of investors. On the other hand, the same kind of logic can also lead to virtuous circles if private sector agents initially find reforms credible. When the economic response is positive, the population at large is more likely to find that the reforms benefit them too, something which creates political support for the reforms. Therefore, they are likely to be sustained, once again fulfilling initial expectations of policy durability.

The debate over the role of political will and political power in economic reform naturally has implications for the credibility of reforms. If will is all that matters for the decision on adopting reforms, private agents will be busy trying to estimate the "will" to sustain reforms possessed by governments announcing such policies. If the will is estimated to be "weak", credibility will be low. However, if political power is the sole determinant of reform sustainability, the important data for potential investors is the sources and strength of reform resistance in the economy. Then reform announcements will scarcely be credible if powerful vested interests or the population at large is believed to prefer the status quo.

The problem with both of these views is that they border on the tautological. If reforms are not implemented, it is because the government lacked the requisite will. Implementation is thus a result of willingness to reform. Likewise, the contrarian position holds that the observation of non-adoption of reforms implies that the government did not have the political power necessary to carry them out. But these simplistic positions will not do. If we equate non-adoption and powerlessness, it becomes impossible to distinguish would-be reformers constrained by circumstance from governments who are wedded to the status quo. And this distinction is clearly important. While the latter type of government never would instigate change, the former would if given more political room to manoeuvre. Hence, if for instance the electorate became more pro-reform, we could observe that a set of reforms previously stalled suddenly became public policy if the government favoured

it, but not if it really sought to perpetuate the original policy stance.

One might then wish to conclude that political will is a necessary but not sufficient condition for reforms. It would follow that observing the adoption of reforms would allow us to conclude that the government consisted of true reformers. Even this might be too simplistic, though. It could be that either political or economic inducements could tempt the wolves of the status quo into posing as the lambs of reforms. An example of the former would be the reverse of the re-election constraint pictured above: a strongly pro-reform electorate could force anti-reform politicians into hiding to stay in office. Or, as in Rodrik (1989), external financing conditioned on reforms could induce a government lacking in true will to adopt new policies with an eye to cashing in before reversing the reforms.

What I want to argue therefore is that it is important to distinguish between the *preferences* of politicians, i.e., will, and the *constraints* they face in choosing policies. One type of constraints, which will be the focus of this paper, are *political.* It seems plausible that sometimes these could be so tight that true reformers have to settle for less. If persisting in adopting reforms leads to the fall of the government with the reform opposition taking its place, the act seems rather futile. Likewise, if serious social unrest will result from starting the reform process, the purpose of the reforms could easily be defeated. Both these types of political resistance to reform could lead investors to conclude that the policies are doomed or at least lower the credibility of them as their expected longevity becomes shorter or less certain. As argued above, such a lack of credibility will often be enough to jeopardise the intended effects of the change in policies.

Another type of constraints facing policy-makers are *economic.* An example of such constraints are world market conditions. As the governments of many developing countries rely heavily on taxation of international trade, these could severely constrain the fiscal position of the government. Or they could be highly volatile, which in an open economy could transplant into great uncertainty about the outcomes produced by economic policies. However, I will analyse more closely one economic constraint that we have already touched upon, namely external financing. External financing can be either on concessional or commercial terms. I will concern myself with the latter.

A third category of constraints is *administrative.* Consideration of them forces a distinction between the adoption and implementation of economic policies. For the most part policies are adopted by politicians and implemented by bureaucrats. These two types of actors might have different goals,

and asymmetries in expertise and information are likely to prevent a complete reconciliation of these through contractual means. Therefore, ignoring the distinction between policy adoption and implementation might lead to serious errors for observers trying to predict or estimate the link between policies and economic outcomes. As argued by Grindle and Thomas (1991), there is reason to believe that the discrepancies between the policies chosen by the politicians and the actual policy stance of the government are particularly large in low-income countries because the implementation stage of the policy process is more politicised there.[5] A lack of technical capacity might add to this problem. Still, I shall stick to the traditional ways of the literature on economic policy and equate adoption and implementation. This will allow me to focus on the distinction between political will and political power, which is my main concern here.

The separation of preferences and the external environment outlined here of course resembles any other game-theoretic approach to economic policy-making.[6] Substantively, it mirrors the distinction made by Drazen and Masson (1994) between the credibility of a policy-maker and the credibility of the policies chosen. The first notion of credibility relates to perceptions about his preferences, the second to consequences of the policies given the economic environment in which they are adopted. Their model is a variant of the Barro-Gordon monetary policy game set in an open economy. Politicians trade off inflation and unemployment, but they feel differently about this trade-off: some of them value reductions in inflation (which through the Phillips-curve come at the cost of an increase in unemployment) more strongly than others. Exactly what the preferences of the current policy-makers are is not known ex ante by private agents though. In their setting, inflation equals currency depreciation. The policy issue is whether to stick with a fixed exchange rate regime or undertake a devaluation of a given size. A credible defender of the exchange rate is one who is perceived by wage setters to be strongly concerned about inflation. One would expect not devaluing in the first period to increase the policy-maker's credibility, i.e., wage setters' estimate of the probability that the policy-maker is "tough" on inflation. However, there is persistence in unemployment. This means that the trade-off between unemployment and inflation becomes more severe in the next period if there is no devaluation in the first. Therefore, a policy of not devaluing in period

[5] See Hagen (1999a) for an attempt at explaining "implementation gaps".

[6] See Persson and Tabellini (1990) for a general discussion of this approach.

one could actually lower the credibility of the fixed exchange rate in period two even though private economic agents believe the policy-maker is putting a relatively high weight on the costs of inflation compared to the costs of unemployment. If wage setters believe that there is a high probability of devaluation in period two, wage increases would be correspondingly higher and this would make devaluation a more tempting option for any type of policy-maker. Hence, by not devaluing in period one, even the staunchest defender of fixed exchange rates might end up choosing to devalue later on because he faces a less favourable economic trade-off. The analogy to the reformer who risks losing power to the defenders of the status quo should be clear.

In this paper, thence, the aim is to investigate the conditions under which types of policy-makers who are differentially committed to reform pick similar or separate policies. In particular, I would like to derive the impact of more or less tightly binding political constraints on the decision on whether to adopt reforms or not. Towards that end, I build a signalling game of policy-making in a small, open economy in which governments are democratically elected. In a separating equilibrium of this game - in which "reform" governments choose policies different from those picked by governments favouring the status quo - political will is the main determinant of reform efforts because governments of different types pursue policies that correspond to their preferences. On the other hand, in a pooling equilibrium, governments choose the same economic policies even though their underlying stance on reform differs. Thus, in this case the degree of political power affects governmental policy; a "binding" political constraint forcing governments with contrarian positions on reform to pool on the same policies. An important question is therefore under what conditions (if any) these kinds of equilibria exist.

In the next section of this paper I spell out the economic and political details of the model. Section 4 is spent on deriving optimal policies for a given probability of re-election. This is a necessary precursor for the analysis of the game proper. Various extensions are pursued in section 5, which is followed by a discussion of what generalisations and extensions of the model one ideally would like to make.

3 The Model

3.1 The Economics

In the economy, which is small and open, a single good is produced combining land and labour in a constant returns to scale technology. Thus, we can write production per worker in period t, y_t, as

$$(1) y_t = a(e_t),$$

where e_t is the land-labour ratio. I assume that labour is inelastically supplied, each worker supplying one unit of labour per period, and that the size of the labour force is constant. It is convenient to normalise the labour force (which is also the total population and the electorate) to one. Thus, per-capita and aggregate magnitudes are identical.

Because both factors are in fixed supply, output is constant. Therefore, I omit time subscripts on y from now on. All citizens are assumed to be identical economically, so that we can restrict our attention to the behaviour of a representative individual when it comes to the economics.

The macro good can be spent on private consumption, c_t and public consumption, g_t. The rates of transformation of output into these goods are fixed at one.

The role of the public sector is to provide a collective good, or a publicly provided private good which is supplied in equal amounts to every citizen, through the funds raised by a proportional tax on private domestic income. Private after-tax disposable income is used for private consumption. The private sector budget constraint is thus

$$(2) (1 - \tau_t) y = c_t,$$

where τ_t is the tax rate. The public sector use the tax revenues and funds raised through bond sales to foreigners to pay for public consumption and the interest and principal due on debt inherited from the past:[7]

$$(3) \tau_t y + b_{t+1} = g_t + (1 + r) b_t.$$

[7] In sub-section 5.2, I analyse what happens if the government is credit-constrained in international financial markets, as this was a reality facing many developing country governments in the 1980s.

b_t is the public sector debt at the beginning of period t. r is the rate of interest prevailing in the world capital market.

There are two periods. At the start of the first, the inhabitants of this society inherits a stock of public debt. They are not allowed to leave any debt at the end of the second period.[8] Below, it will be convenient to have expressions for the amount of resources which is available for spending on private and public consumption. They are found by combining the private and public budget constraints. Let Φ_t denote this magnitude in period t; and let Φ be the discounted value over the two periods. By (2) and (3) we have

$$\begin{aligned}(4a)\Phi_1(b_2) &= y + b_2 - (1+r)\,b_1;\\ (4b)\Phi_2(b_2) &= y - (1+r)\,b_2;\\ (4c)\Phi &= \Phi_1(b_2) + \frac{\Phi_2(b_2)}{1+r} = \frac{y}{1+r} + y - (1+r)\,b_1.\end{aligned}$$

3.2 The Politics

All individuals h in this economy evaluate private versus public consumption at time t according to a utility function of the following form:

$$(5)U^h(c_t, g_t) = \alpha^h \ln c_t + \left(1-\alpha^h\right) g_t.$$

Potential governments i (first period) and j (second period) have similarly structured preferences.[9] In other words, they are policy-motivated.[10]

[8]Even though the time-inconsistency problem of public debt is likely to be the source of the credit constraint, I assume it away because it is not my concern here.

[9]This specification is chosen because it eliminates the incentives policy-motivated governments have to manipulate the level of debt (or any other state variable controlled) in order to affect second-period policies. These incentives are well known - see e.g. Milesi-Ferretti (1995), Persson and Svensson (1989), or Tabellini and Alesina (1990) - and are also not particularly interesting in connection with the issue at hand. However, the results can also be extended to the case where there are strategic incentives to manipulate the public debt (see Appendix D). In addition, the homotheticity of preferences ensures that the probability of an incumbent government being re-elected does not depend on first-period policies other than through the voter beliefs these policies induce (see below). This greatly simplifies the discussion.

[10]This can easily be extended to the case where they also put some weight purely on being in office, as long as the "gain from being in office" is not too high. For proof of this claim, see Appendix E.

For simplicity, we shall assume that there are only two potential types of governments, pro-reform (R) and pro-status quo (S). The reform that we will study below is a stylised depiction of "privatisation" or a scaling down of the size of the public sector relative to the private sector.[11] To some extent this captures an important part of many structural adjustment programmes in developing countries during the last decade and a half where the aim has been to allow the market a greater role in the allocation of resources. This means that a pro-reform government is taken to be one that puts greater relative weight on private consumption than an anti-reform government: $\alpha^R > \alpha^S$. Needless to say, this approach glosses over a host of both economic and political problems in connection with privatisation or deregulation. I also ignore issues of economic stabilisation, which policy-makers in many cases have had to deal with simultaneously with structural problems. Nevertheless, it allows me to focus on the impact of political will versus political power in economic reforms in a simple way while retaining an empirically relevant policy issue.

The political constraint on policy choice that we will investigate below is the re-election constraint, i.e., voters' preferences over the trade-off between private and public consumption. The reason for this choice is that empirically, it seems to have been the most important one in democracies. Several studies of stabilisation and structural adjustment in developing countries during the 1980s conclude that "vested interests" have not played an important part in determining whether reforms have been adopted or not. This conclusion holds for both democracies and autocracies. For example, Bates and Krueger (1993; page 455) conclude that "[o]ne of the most surprising findings of our case studies is the degree to which the intervention of interest groups fail to account for the initiation, or lack of initiation, of policy reform." According to Haggard and Kaufman (1992; page 30): "[T]he most important political influence on the willingness of state elites to initiate new adjustment policies was connected with changes of government or political regime. Governments facing upcoming electoral challenges, not surprisingly, have generally been reluctant to impose unpopular programs. Incoming governments, by contrast, have capitalised on honeymoon periods and the disorganization or discrediting of the opposition to launch ambitious new reform initiatives." Hence, for our purposes, the restriction of attention to the electoral constraint seems eminently defensible.[12]

[11] Hence, it can also be interpreted as a fiscal reform.

[12] Of course, this restriction does not allow us to generalise the results to autocratic

3.3 The Strategic Structure: Information and the Timing of Moves

The timing of events in this two-period world is the following:

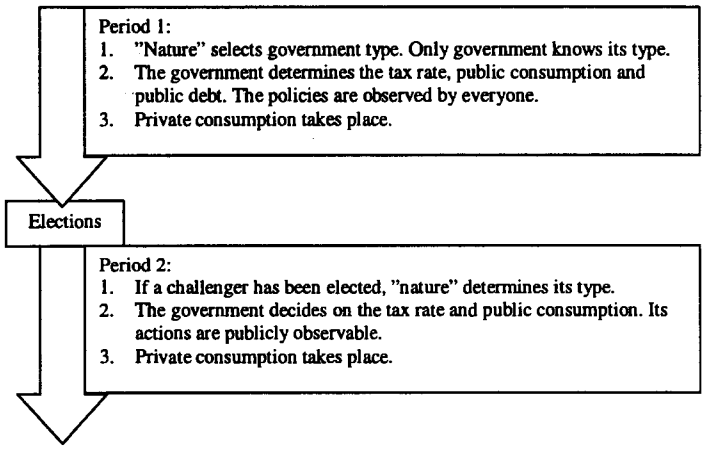

Figure 1: timing of moves

In each period, the government makes its policy decisions, and the private sector's economic role is simply to consume after-tax disposable income.

While I assume that governments are policy-oriented, I shall not assume that they are formed by political parties which are ideologically rigid. In many developing countries, particularly in newly established democracies, parties are not much more than labels on bottles with a fairly rapidly changing content. Therefore, voters cannot really be sure that they get what the labels read before the elections. Also, there have been quite a few examples of surprise reformers, i.e., reformers representing parties or having a

regimes. And pressure groups could conceivably influence other aspects of reforms, e.g. content or scope, which are not at issue here. It could also be that the temporal conjunction of macroeconomic instability requiring stabilisation - a collective good - and structural problems which invariably create the need for reforms with a concentrated impact, allowed governments more leeway than they would otherwise have had. For example, Rodrik (1994) believes that bundling macroeconomic stabilisation policies together with trade liberalisation allowed governments to adopt the latter without much resistance from the beneficiaries of protectionist policies. More generally, when macroeconomic crisis go together with a host of structural problems, the net benefits to any one group in society of extensive reforms are difficult to determine. This point is emphasised by Nelson (1990), who does not reach as strong conclusions about pressure group influence as the authors cited above.

track-record suggesting that they would be anti-reform.[13] A prominent one is president Carlos Menem of Argentina who belongs to the Peronist Party, a party known for its statist proclivities. Still, Menem has embarked on a far-reaching programme of privatisation.[14]

The upshot of all this is that voters - and other agents - are assumed to believe that any government might be a reform government. The probability they attach to this happening ex ante is denoted by $\mu \in (0,1)$. After observing what a government does in office in period 1, this probability is updated to ρ. The challenger facing the government in the election at the end of this period is still valued according to ex ante estimates as no new information about it has been revealed.[15] Thus, with respect to voters, the government in office in period 1 has a first-mover advantage. It might choose to reveal its identity or to hide it depending upon among other things which of these strategies contribute the most to its re-election prospects. Voters use first-period policies as data when reconsidering their beliefs about the government's type. They then vote for the incumbent or the challenger according to which one will give them the highest expected second-period utility.

A generic feature of large-scale elections is uncertainty about the outcome because nobody knows for sure the way in which voters evaluate their options. Here, we take this to imply that no-one knows the exact distribution of the preference parameter in the electorate. In particular, the median of this distribution - α^M - is considered a random variable distributed according to $A(z)$. That is, $A(z) = prob\left(\alpha^M \leq z\right)$. This cumulative distribution function constitutes the common estimate used by all politicians to infer the likelihood of the government staying put.

[13] Such changes in positions need not always signify opportunism as new information about the "right" model of the economy is likely to change the merits of various policies for all but the most extremist politician. See Cukierman and Tommasi (1998a,b) for a theoretical explanation of surprise reformers.

[14] Another example which comes readily to mind is former president Perez of Venezuela, who had been a traditional Latin American leftist politician before returning to office in the late 1980s in a reformist mood. More examples can be found in Cukierman and Tommasi (1998a,b).

[15] Actually, the number of challengers does not matter because they are all identical ex ante in the eyes of both the electorate and the incumbent government. For convenience, I will talk about the electoral opposition in the singular.

4 Optimal Policies for a Given Probability of Re-Election

4.1 Period 2 Policies

There are two constraints on the choice of period 2 policies, the private budget constraint $c_2 = (1 - \tau_2) y$, and the appropriate specification of (3), the government's budget constraint (notably, no outgoing stock of public debt). There are therefore only two policy instruments in period 2, and through the budget constraint the level of one of them is determined by the level chosen for the other. We can combine the private and the public budget constraints into the aggregate resource constraint $\Phi_2(b_2) = c_2 + g_2$, and let the government choose public consumption. This determines private consumption as well.

As there are no more elections, there is nothing to hide. A government of type j thus chooses public consumption to maximise its second period utility (the appropriate version of (5)) given available resources. As shown in Appendix A, the optimal levels of public and private consumption in period 2 are[16]

$$\begin{aligned} (6a) c_2^{j*}(b_2) &= \alpha^j \Phi_2(b_2); \\ (6b) g_2^{j*}(b_2) &= \left(1 - \alpha^j\right) \Phi_2(b_2). \end{aligned}$$

Naturally, the optimal *levels* of consumption depend on the debt inherited from period 1. Note, though, that the optimal *distribution* of resources between private and public consumption does not depend on the amount of resources available. This is due to the homotheticity of the objective function.

4.2 Voter Behaviour

We are now in a position to derive voter h's indirect utility contingent on a government of type j being in office in period 2; write this as $V_2^h(b_2; j) \equiv U\left(c_2^{j*}(b_2), g_2^{j*}(b_2)\right)$. On the basis of this, we can find the set of voters H who are indifferent between re-electing the incumbent government and electing the

[16] For the sake of completeness, note that this implies that $\tau_2^{j*}(b_2) = 1 - \alpha^j \left[\frac{\Phi_2(b_2)}{y}\right]$.

challenger. These voters have a weight on the utility of private consumption satisfying

$$(7)\rho V_2^H(b_2;R)+(1-\rho)V_2^H(b_2;S)=\mu V_2^H(b_2;R)+(1-\mu)V_2^H(b_2;S).$$

Rewriting this, we get

$$(7)'(\rho-\mu)\left[V_2^H(b_2;R)-V_2^H(b_2;S)\right]=0.$$

We see that if $\rho=\mu$, this identity is satisfied no matter what the indirect utilities under the different government types are. In other words, all voters are indifferent between incumbent and challenger in this case because the probability of a reform policy is the same regardless of which government is elected. In a pooling equilibrium, where both types of governments choose the same policy in period 1, voters get no new information on the incumbent's type and so $\rho=\mu$. With all voters being indifferent, we can without loss of generality assume that they toss a fair coin to decide their ballot decision. Therefore, the probability of the incumbent being re-elected is 1/2 in this case.

If on the other hand $\rho\neq\mu$, (7)' is satisfied if and only if the term in brackets is equal to zero. Straightforward algebra then reveals the indifferent voter's weight on private consumption to be

$$(8)\alpha^H=\frac{\ln\left(1-\alpha^S\right)-\ln\left(1-\alpha^R\right)}{\left[\ln\alpha^R-\ln\alpha^S\right]+\left[\ln\left(1-\alpha^S\right)-\ln\left(1-\alpha^R\right)\right]}.$$

It is possible to show that α^H lies between α^R and α^S (see Appendix A).

All individuals with an α smaller than α^H prefers an S-government to an R-government. Those whose weight on the utility of private consumption exceeds that of the indifferent voter have the reverse preference ordering over governments. Voters vote for their most preferred alternative. A government of type j will be re-elected if at least half the voters prefer it to the alternative. The crux of the matter is that no-one knows for certain which type of government the majority of the voters prefer. This means that in separating equilibria, where the government reveals its type, the probability of being re-elected is perceived to be (once again abusing notation slightly)

$$(9)q^{isep}\equiv\begin{cases}prob\left(\alpha^H<\alpha^M\right)=1-A\left(\alpha^H\right),i=R;\\ prob\left(\alpha^H\leq\alpha^M\right)=A\left(\alpha^H\right),i=S.\end{cases}$$

Of course, these probabilities must sum to one: $q^{Rsep} + q^{Ssep} = 1$. The behaviour of voters as a function of their preferences and beliefs about the incumbent's type is depicted in figure 2.

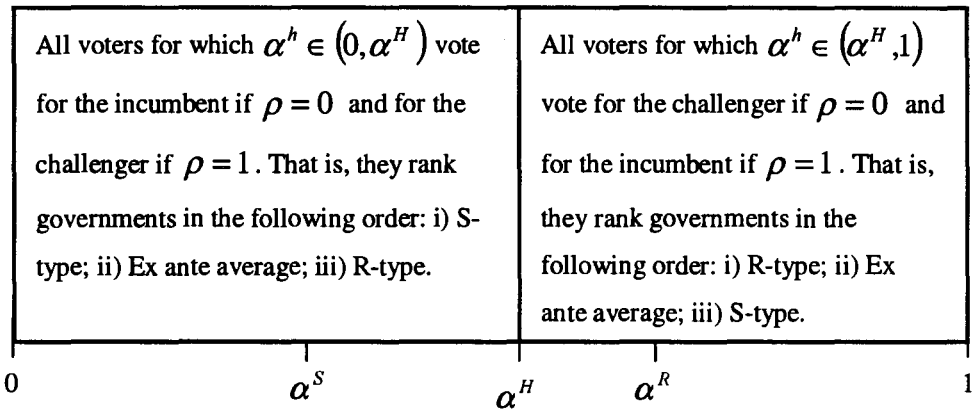

Figure 2: voter behaviour given preferences and beliefs

It follows that the probability of retaining power does not depend on first-period policies in other ways than through which type of equilibrium is played. As noted above, the probability is $1/2$ in a pooling equilibrium; it can be more or less than that in a separating equilibrium, but that depends only on which type you are. Either the populace is perceived to be pro-reform ($q^{Rsep} > 1/2 > q^{Ssep}$), possibly giving the proponents of the status quo an incentive to mimic the reformers, or it is the other way around, giving them the upper hand.

4.3 Period 1 Policies When the Government Is Not Credit-Constrained

Let $\pi^i(q, \mu)$ be the probability that the preferences of a type i incumbent is decisive for the choice of period 2 policies when the probability of re-election is estimated to be q. This is the probability that the government is re-elected plus the probability that it is not times the probability that a challenger is of the same type:

$$(10)\pi^i(q, \mu) = \begin{cases} q + (1-q)\mu, i = R; \\ q + (1-q)(1-\mu), i = S. \end{cases}$$

First I derive optimal policies for a given probability of re-election. Using $(4a)$ and $(6a-b)$, the expected discounted utility of a type i first-period government as a function of its choice of period 1 policies and the probabilities q and μ can be written as

$$(11)\Omega^i(c_1, g_1, b_2; q, \mu) = \alpha^i \ln[\Phi_1(b_2) - g_1] + (1-\alpha^i)\ln g_1 + \delta W^i(b_2; q, \mu)$$

where $W^i(b_2; q, \mu) = \pi^i(q, \mu) V_2^i(b_2; i) + [1 - \pi^i(q, \mu)] V_2^i(b_2; m)$, $i, m = R, S$, $i \neq m$ is i's expected indirect period 2 utility and $\delta \leq \bar{\delta}$ is the discount factor.[17] The optimal levels of g_1 and b_2 for a type i incumbent given q and μ are then found by maximising (11). Substituting these results into the private and public budget constraints gives us the optimal levels of private consumption and the tax rate respectively (see Appendix A):

$$\begin{aligned}
(12a)b_2^* &= \Psi\Phi - [y - (1+r)b_1]; \\
(12b)g_1^{i*} &= (1-\alpha^j)\Psi\Phi; \\
(12c)\tau_1^{i*} &= 1 - \left[\frac{\alpha^i \Psi\Phi}{y}\right]; \\
(12d)c_1^{i*} &= \alpha^i \Psi\Phi.
\end{aligned}$$

$\Psi = \frac{1}{1+\delta}$ can be interpreted as the optimal share of total consumable resources that is spent in period 1. This fraction is the same for both types. In the following, I will speak of the these policies as the "first-best" policies of type i. Note that these are the choices that i would have made if its type were known by voters since $q = q^{isep}$ is obviously a special case of an environment in which the probability of being re-elected is fixed. Also note that the optimal solutions do not depend on the probability of i's preferences determining period 2 policies.[18] However, the expected two-period indirect utility will of course depend on q. This maximum-value function is defined as $\omega^i(q, \mu) \equiv \Omega^i(c_1^{i*}, g_1^{i*}, b_2^*; q, \mu)$. This function plays an important role in determining what policies will emerge in equilibrium of the policy game between pro- and anti-reform governments because it is always possible for type i to choose its first-best policies as given by (12), accept the probability

[17] The restriction on the discount factor is to a number no less than one (see below).

[18] In Appendix D, it is shown that all of the results derived in the main text extend to the case $\Psi^i = \Psi^i(q, \mu)$, when in general $\Psi^R(q, \mu) \neq \Psi^S(q, \mu)$.

of re-election induced by this choice, and get the corresponding level of utility $\omega^i(q,\mu)$. This is *Lemma 1*:

Lemma 1:

No type can do worse than in the case where choosing its first-best policies lead voters to believe that it is the type with an electoral disadvantage.

4.4 Period 1 Policies When the Government Is Credit-Constrained

Suppose that the government is credit-constrained; its end-of-period debt cannot exceed $B < b_2^*$. It should be fairly obvious that for a given probability of re-election, the optimal policies for a type i first-period government are $\{\alpha^i\Phi_1(B), (1-\alpha^i)\Phi_1(B), B\}$. That is, being credit-constrained, i will borrow as much as possible. It will then distribute available resources between private and public consumption (by way of the tax rate) in the "first-best" manner. The maximum-value function is now $\overline{\omega}^i(q,\mu,B) \equiv \Omega^i(c_1^{i*}, g_1^{i*}, B; q, \mu)$. Since $\Omega^i(c_1, g_1, b_2; q, \mu)$ is a strictly concave function of b_2, $\overline{\omega}^i(q,\mu,B) \leq \omega^i(q,\mu)$, with equality only at $B = b_2^*$. We are now fully equipped to study the signalling game between different types of governments and voters.

5 Reforming the Economy in Dire Straits and in Times of Plenty

5.1 In Times of Plenty: To Reform Or Not To Reform?

For the sake of illustration, suppose that the incumbent government wants reforms, but voters are favourably disposed towards the status quo: $q^{Ssep} > 1/2 > q^{Rsep}$.[19] Would the reformers be willing to forego the opportunity to pursue their optimal policies in period 1 in order to increase the probability that they are in power in period 2 and thus can implement reforms then? More precisely, would a type R government be willing to choose the optimal policies of S-government in order to hide its identity from voters and thereby get the higher probability of re-election that S has?

[19] All the results in this and the next section generalise to the case where an S-government is in power in period 1 and/or voters are pro-reform (see the Appendix).

Suppose that voters hold the following beliefs: If they observe $\{c_1^{S*}, g_1^{S*}, b_2^*\}$ in the first period, $\rho = 0$; otherwise $\rho = 1$. That is, unless the government pursues the first-best policies of a status quo government, voters believe it is a reform government.

If it chooses the optimal policies of S, an R-government gets a utility of $\Omega^R\left(c_1^{S*}, g_1^{S*}, b_2^*; q^{Ssep}, \mu\right)$. If it stubbornly sticks to its reform policies, it gets $\omega^R\left(q^{Rsep}, \mu\right)$, and given the beliefs of voters, this is the best it can do if it chooses not to mimic S. Equating these, we find a critical value of the discount factor such that for all discount factors lower than this, it is not worthwhile for R to hide its true type from voters by posing as S:

Proposition 1

There exists a critical value of the discount factor

$$\overline{\delta}^R\left(q^{Ssep}, \mu\right) = \frac{1}{\left(2q^{Ssep} - 1\right)(1-\mu)} \geq 1.$$

such that for $\delta \leq \overline{\delta}^R\left(q^{Ssep}, \mu\right)$, R at least weakly prefers choosing $\{c_1^{R*}, g_1^{R*}, b_2^*\}$ to choosing $\{c_1^{S*}, g_1^{S*}, b_2^*\}$ even if the latter induces voters to believe it is S and the former course of action reveals its identity. This critical value has the following properties:

$$\begin{aligned}
(a)\frac{\partial \overline{\delta}^R\left(q^{Ssep}, \mu\right)}{\partial q^{Ssep}} &= -\frac{2}{\left(2q^{Ssep} - 1\right)^2(1-\mu)} < 0; \\
(b)\frac{\partial \overline{\delta}^R\left(q^{Ssep}, \mu\right)}{\partial \mu} &= \frac{1}{\left(2q^{Ssep} - 1\right)(1-\mu)^2} > 0; \\
(c)\lim_{q^{ksep} \to \frac{1}{2}} \overline{\delta}^R\left(q^{Ssep}, \mu\right) &= \infty; \lim_{q^{ksep} \to 1} \overline{\delta}^R\left(q^{Ssep}, \mu\right) = \frac{1}{1-\mu}; \\
\lim_{\mu \to 0} \overline{\delta}^R\left(q^{Ssep}, \mu\right) &= \frac{1}{2q^{Ssep} - 1}; \lim_{\mu \to 1} \overline{\delta}^R\left(q^{Ssep}, \mu\right) = \infty.
\end{aligned}$$

Proof: See Appendix B.

In sum, the lower the probability that the challenger is of type R and the greater the electoral advantage of S (i.e., the higher is q^{Ssep}),[20] the lower the

[20]To be more precise, the electoral advantage that S has is $q^{Ssep} - q^{Rsep} = q^{Ssep} - \left(1 - q^{Ssep}\right) = 2q^{Ssep} - 1$, which is increasing in q^{Ssep}. Because the cut-off rate is decreasing in the electoral advantage, it is decreasing in the probability that S is re-elected if its identity is revealed.

critical value of the discount factor, that is, the lower the weight that must be placed on future outcomes if S is to be able to separate out by choosing its first-best policies.

Corollary 1:

When none of the types has an electoral advantage, the first-best policies become dominant strategies for both types, i.e., $\left\{\left\{c_1^{S*}, g_1^{S*}, b_2^*\right\}, \left\{c_1^{R*}, g_1^{R*}, b_2^*\right\}\right\}$ is the only equilibrium.

Proof: The critical value goes to infinity as $q^{Ssep} \to \frac{1}{2}$.

In the special case where $q^{Ssep} = \frac{1}{2} = q^{Rsep}$, none of the types has an electoral advantage if their types are known by the electorate.[21] Obviously, there is then no incentive for any type of government to deviate from its first-best policies in order to reveal its identity; nor is there any incentive for a government to deviate from its first-best policies with an eye to hiding its true type. In other words, the first-best policies are dominant strategies for both types. Therefore, voters should upon seeing R's first-best policies realise that the incumbent is of type R, and they should believe that they are facing an S-incumbent if first-period policies equal those preferred by S. Whatever voters believe if they for some reason observe a set of policies different from these two, S and R will play $\left\{c_1^{S*}, g_1^{S*}, b_2^*\right\}$ and $\left\{c_1^{R*}, g_1^{R*}, b_2^*\right\}$ respectively.

In the more interesting cases where $q^{Ssep} \neq \frac{1}{2} \Leftrightarrow q^{Rsep} \neq \frac{1}{2}$, which we will be studying in the rest of the paper, we have

Corollary 2:

As the probability that the challenger is of type R goes to one, the first-best policies become dominant strategies for both types, i.e.,

$\left\{\left\{c_1^{S*}, g_1^{S*}, b_2^*\right\}, \left\{c_1^{R*}, g_1^{R*}, b_2^*\right\}\right\}$

is the only equilibrium.

Proof: The cut-off rate goes to infinity as $\mu \to 1$.

As the probability of the challenger being of the same type as oneself goes to one, a first-period government of type i becomes certain that next period policies are determined by a government with preferences identical to its own whether it loses or wins the election (c.f. (10): $\pi^R(q,1) = \pi^S(q,0) = 1$). This also makes choosing its first-best policies a dominant strategy. Therefore, if this happens to R, S is free to choose its first-best policies too. Of course, this is a "limit result" in the sense that the game ceases to be a signalling game if the probability of the government being of type R goes to one, because then

[21] This would happen in the unlikely case where $A(\alpha^M) = A(\alpha^H) = \frac{1}{2}$.

the probability of the government being of type S goes to zero; i.e., there is no uncertainty about the government's identity. However, if we had assumed that the voters ex ante believed that a newly elected government in period t was of type R with probability $\mu_t \in (0,1)$, the result would continue to hold with respect to μ_2. That is, as μ_2 approached zero (one), implying that the probability that the challenger is of type R goes to one (zero), the first-best policies of S (R) would become its dominant strategy. The driving force behind this result is of course the assumption that governments are purely policy-motivated and not at all interested in political power per se. Hence, the result would not hold if this assumption was relaxed.

Remark 1:

When $q^{Ssep} < 1$, $\delta^R\left(q^{Ssep}, \mu\right) > 1$. That is, as long as the type with an electoral advantage is not guaranteed to win the election if its type is revealed to voters, more weight must be put on the outcomes of the second period if the simple separating equilibrium where both types choose their first-best policies is to be upset. With a positive rate of time preference, this can only happen if period 2 is longer than period 1. This situation arises because of the simple fact that the gain to R from being in power in period 2 instead of S is the same as the loss from choosing the optimal policies of S in period 1. However, the gain is uncertain. Mimicking S increases the probability that R's preferences determine period 2 policies. But as long as $q^{Ssep} < 1$, the gain is not guaranteed even if R successfully fools the voters. The challenger might win, and the challenger might have the same kind of preferences as S. On the other hand, the challenger might be identical to R. This weakens its incentives to mimic S even if this act ensures an electoral victory; being purely office-motivated, R does not mind if an identical challenger wins the election instead of himself.[22]

For some parameter values, there might exist pooling equilibria. That is, there might be Perfect Bayesian Equilibria in which both types of government choose the same policies in period 1, making the incumbent indistinguishable

[22]Hence, if there are "gains from being in office" over and above the gain from being able to determine policies, the incentives to mimick would be greater. And the greater these gains, or the greater the weight attatched to these relative to the policy objectives, the lower the critical value of the discount factor ensuring the existence of a simple separating equilibrium. In Appendix E I prove that there is a critical value of the "gains from being in office", $\overline{\kappa}$, such that for $\kappa \leq \overline{\kappa}$, the results derived here go through, and show that $\overline{\kappa}$ is increasing in the weight attached to ideology and in the probability that the type with an electoral advantage wins the election.

from the challenger in the eyes of the voter. However, these equilibria do not survive the elimination of weakly dominant strategies for R. Because R is at the most indifferent between separating out and mimicking S even if the latter course of action successfully fool voters into thinking it is S, choosing $\left\{c_1^{S*}, g_1^{S*}, b_2^*\right\}$ is at least weakly dominated for R as long as $\delta \leq \overline{\delta}^R \left(q^{Ssep}, \mu\right)$. $\left\{c_1^{S*}, g_1^{S*}, b_2^*\right\}$ is of course not dominated for S since $\omega^S \left(q^{Ssep}, \mu\right)$ is the highest level of utility that is attainable for it given voter preferences. Thus, we have

Proposition 2

For $\delta \leq \overline{\delta}^R \left(q^{Ssep}, \mu\right)$, there is a unique pure-strategy Perfect Bayesian Equilibrium of the policy game in non-dominated strategies in which both types choose their first-best policies.

Corollary 3

There are no mixed-strategy equilibria.

The conclusion is thus strong: it is indeed only political will that matters for reform choice.

5.2 To Reform or not to Reform When in Dire Straits

As mentioned in the introduction, the governments of many developing countries had difficulties obtaining private credit in the decade of the debt crisis. On the face of it, it seems likely that this could upset an equilibrium of the type described in the last section, because a government constrained in its actions can not get as high a level of utility from its "second-best" policies as it can from its "first-best" policies, and, generally, it will be lower. This could presumably tempt a government with an electoral disadvantage into mimicking the other type of government because the cost of doing so in terms of moving away from its optimal period 1 policies is lower.

However, the results of the last section immediately suggest that this intuition is wrong. The political conflict is over the distribution of resources between public and private consumption. Both types want the same intertemporal distribution of resources, so restricting this distribution to some inoptimal level does not change the bottom line: It is not optimal to forsake the opportunity to determine the distribution between private and public consumption in period 1 in exchange for an increase in the probability that one's own kind of preferences determine the allocation in period 2.

In fact, the result is even stronger than this, because, as shown in the appendix, it generalises to the case where the two types of government in general

want different intertemporal distributions of resources. These differences in "first-best" policies are derived from the underlying primary dimension of political conflict, and are thus of second-order importance. Therefore, unless future outcomes are accorded disproportionate weight, no government wants to exchange the certainty of having an "optimal" ratio of private to public consumption today for an increase in the likelihood that tomorrow's ratio is "optimal".

6 Summary, Extensions, and Concluding Remarks

In this paper, it has been shown that, under a wide range of circumstances, whether or not policy reforms are chosen by governments depends only on the preferences of these governments. Thus, somewhat surprisingly, a strong conclusion is that the political power of the government does not matter, at least not when power is interpreted as electoral strength. In light of this, the emphasis presently placed on ownership by IFIs and bilateral donors seems warranted.

There are of course several limitations of the present analysis. However, given the conclusions of the empirical literature cited in sub-section 3.2, I do not believe that the specific representation of political power lies behind the weak showing of the power hypothesis here. I would also argue against any claims as to the irrelevance of the democratic framework for the analysis. Admittedly, many developing countries are still "democratic infants", but it is not clear that this would bias the conclusions derived here in one way or the other. Moreover, the recent democratic wave in low-income countries implies that a democratic framework is becoming even more relevant to the study of reform choices in these countries.

In my view, there are three important limitations of the model used here: i) the exogeneity of the economy; ii) the one-to-one correspondence between political preferences and reforms; and iii) the equation of policy choice and policy implementation. The untenability of the latter standard assumption was discussed in section 2, so here it suffices to note that it is not obvious that distinguishing between the adoption of reforms and their implementation will change the conclusions derived here. That "vested" interests probably are more likely to succeed in trying to prevent the implementation of reforms

than their adoption would not seem to imply that reform governments should not pursue them (except possibly for the futility of the task).[23]

I therefore conclude by way of commenting on i) and ii) in the reverse order. In the model, I assume that "first-best" policies follow directly from preferences. Therefore, a reform is simply the difference between the "first-best" policies of what is defined to be "reform" and "status-quo" governments. It is clearly possible to derive conditions under which even "status-quo" governments would choose reforms in the sense of changing their policies, say with exogenous changes in the state of the economy. I do not think that this would add much to the current subject. Moreover, the more interesting aspects of the impact of more complex environments on policy reforms have already been analysed. In section 2, I mentioned the work of Cukierman and Tommasi (1998a,b), in which optimal policies depend on the state of the world regardless of ideology. However, governments are more likely to succeed in convincing the electorate of the need for reform when their basic policy preferences are more in line. A reform could thus be adopted simply because a new government which is closer ideologically to the mainstream of the electorate comes to power; conversely, the status-quo could be perpetuated because voters remain unconvinced about the need for reform. In another important paper, Fernandez and Rodrik (1991) investigates a different aspect of uncertain links between policies and outcomes, namely, uncertain individual-specific benefits from reform. That is, if individuals are uncertain whether they will benefit from a reform, the support for such reforms might be lower than if the distribution of benefits was known. This holds even if it is known that in the aggregate, expected net benefits are positive. This gives rise to a status quo bias: there are reforms that would have commanded a majority of votes ex post (after the outcome has materialised) which will never be adopted because of the ex ante individual-specific uncertainty.

In sum, I think the main way to go is to add more economic structure to the model by making income endogenous. The most important change would be to allow for investment in fixed capital in the economy in question - as noted in section 2, the credibility of reforms is intimately linked with

[23]The reason why in my opinion it seems more reasonable to expect "vested" interests to succeed at the implementation stage than at the choice stage, is that collective action problems are likely to be much smaller at the former stage. This is because there will be both fewer competitors and fewer individuals who must be "persuaded" in implementation, since the groups can focus on the agency charged with implementing the specific part(s) of the reforms in which they are interested. I intend to pursue this matter in future research.

investment since investment is the key to raising growth. However, preliminary analysis indicate that if investment by the private sector is added to the current model, it becomes very complex; optimal debt policies would depend on investment because investment distributes resources across time, while investment would depend on debt policies because the public debt determines the period 2 tax rate, and so on. Most likely, therefore, one would have to simplify in other dimensions, say, by excluding public debt. It would also be interesting to consider carefully the link between policies, investment, and another source of external financing: foreign aid. In a well-known paper, Rodrik (1989) concludes that a donor which conditions his assistance on reforms might "force" a reform government to choose more extreme policies than it would otherwise have chosen. The reason is that a government which does not want reforms is then more inclined to temporarily hide its true stripes in order to collect the aid. If it does so, the possibility of reform reversal arises, with adverse consequences for private investment. However, in that paper, the giving of aid is not modelled, and, as mentioned in the introduction, the problems connected with conditionality have proved to be very real. Therefore, studying the strategic interaction of donors and recipients is necessary if one is to derive reasonable conclusions. A first stab at such an analysis is made by Hagen (1999b), but that model too should be extended to allow for endogenous private economic activity.

It remains to be seen whether such extensions would affect the main conclusion of this paper, namely, that in both "good" and "bad" times, it takes political will to reform existing policies.

7 Appendix A

7.1 Policy Choice as a Decision Problem

7.1.1 Optimal Period 2 Policies

A type j period 2 government wants to choose the tax rate and public consumption to maximise

$$(A1) U^j(c_2, g_2) = \alpha^j \ln c_2 + \left(1 - \alpha^j\right) \ln g_2$$

subject to the constraints

$$(A2)\ (1 - \tau_2)\, y = c_2;$$

$$(A3)\tau_2 y = g_2 + (1+r)\, b_2.$$

Combining the constraints and inserting the result in $(A1)$, we have a maximisation problem in one variable only. If this variable is g_2, the result is the following first-order condition:

$$(A4)\frac{\partial U^j\left(c_2^{j*}, g_2^{j*}\right)}{\partial g_2} = -\frac{\alpha^j}{\Phi_2(b_2) - g_2^{j*}} + \frac{1-\alpha^j}{g_2^{j*}} = 0,$$

from which the optimal period 2 level of public consumption is derived. The resulting private consumption level is found either by substituting the solution to $(A4)$ into the public budget constraint to find the optimal tax rate and using the result to deduce private consumption; or by plugging the result directly into the overall resource constraint of the economy. Carrying out these steps leads to the following optimal policies and corresponding private consumption:

$$\begin{aligned}
(A5a)g_2^{j*}(b_2) &= \left(1-\alpha^j\right)\Phi_2(b_2); \\
(A5b)\tau_2^{j*}(b_2) &= 1-\alpha^j\left[\frac{\Phi_2(b_2)}{y}\right]; \\
(A5c)c_2^{j*}(b_2) &= \alpha^j\Phi_2(b_2).
\end{aligned}$$

The second derivative of the objective function is

$$(A6)\frac{\partial^2 U^j\left(c_2^{j*}, g_2^{j*}\right)}{\partial\left(g_2\right)^2} = -\left[\frac{\alpha^j}{\left(\Phi_2(b_2) - g_2\right)^2} + \frac{1-\alpha^j}{\left(g_2\right)^2}\right] < 0.$$

Hence, the second-order condition for an optimum is fulfilled. Note that as the objective function is globally concave, we have found a unique optimum.

All the variables in $(A5)$ are functions of the level of resources available in period 2 and thus of the public debt carried over to that period. As $\frac{\partial\Phi_2(b_2)}{\partial b_2} = -(1+r)$, it is easily seen that the comparative statics are

$$\begin{aligned}
(A7a)sign\frac{\partial g_2^{j*}(b_2)}{\partial b_2} &= sign\frac{\partial c_2^{j*}(b_2)}{\partial b_2} = sign\frac{\partial\Phi_2(b_2)}{\partial b_2} < 0; \\
(A7b)sign\frac{\partial\tau_2^{j*}(b_2)}{\partial b_2} &= -sign\frac{\partial\Phi_2(b_2)}{\partial b_2} > 0.
\end{aligned}$$

The indirect utility of a type i period 1 government when a type j period 2 government chooses policy is

$$\begin{aligned}(A8)V_2^i(b_2;j) &\equiv U^i\left(c_2^{j*},g_2^{j*}\right)=\alpha^i\ln\alpha^j\Phi_2(b_2)+\left(1-\alpha^i\right)\ln\left(1-\alpha^j\right)\Phi_2(b_2)\\ &= \alpha^i\ln\alpha^j+\left(1-\alpha^i\right)\ln\left(1-\alpha^j\right)+\ln\Phi_2(b_2)\\ &\equiv \eta^{ij}+\ln\Phi_2(b_2);i,j=R,S.\end{aligned}$$

Note that since $\alpha^R\neq\alpha^S$ and the optimal policy choice for each type is a unique, it follows that $\eta^{RR}>\eta^{RS}$ and $\eta^{SS}>\eta^{SR}$. In other words, for all b_2 such that $\Phi_2(b_2)>0$, $V_2^R(b_2;R)>V_2^R(b_2;S)$ and $V_2^S(b_2;S)>V_2^S(b_2;R)$.

Because a higher debt level means that there is less to spend on private and public consumption in period 2, the derivative of (A8) with respect to is negative:

$$(A9)\frac{\partial V_2^i(b_2;j)}{\partial b_2}=-\frac{(1+r)}{\Phi_2(b_2)}<0;i,j=R,S.$$

This is just another way of stating that the marginal utility of income is positive in each possible future state ($\frac{\partial V_2^i(b_2;j)}{\partial\Phi_2(b_2)}>0;i,j=R,S$). Also note that first-period governments R and S evaluate increases in b_2 identically.

7.1.2 Expected Period 2 Utility

The expected period 2 utility of a type i period 1 government is

$$\begin{aligned}(A10)W^i(b_2;q,\mu) &= qV_2^i(b_2;i)+(1-q)\left[\mu V_2^i(b_2;R)+(1-\mu)V_2^i(b_2;S)\right]\\ &= \begin{cases}\left[q+(1-q)\mu\right]V_2^R(b_2;R)+(1-q)(1-\mu)V_2^R(b_2;S),i=R;\\ \left[q+(1-q)(1-\mu)\right]V_2^S(b_2;S)+(1-q)\mu V_2^S(b_2;R),i=S.\end{cases}\end{aligned}$$

Define the probability that the preferences of a period 1 government of type i is decisive in period 2 as

$$(A11)\pi^i(q,\mu)=\begin{cases}q+(1-q)\mu,i=R;\\ q+(1-q)(1-\mu),i=S.\end{cases}$$

We can then rewrite $(A2.1)$ as

$$
\begin{aligned}
(A10)'W^i(b_2;q,\mu) &= \pi^i(q,\mu)\,V_2^i(b_2;i)+\left[1-\pi^i(q,\mu)\right]V_2^i(b_2;m)\\
&= \left\{\pi^i(q,\mu)\,\eta^{ii}+\left[1-\pi^i(q,\mu)\right]\eta^{im}\right\}+\ln\Phi_2(b_2)\\
&= E_2^i(\eta;q,\mu)+\ln\Phi_2(b_2)\,;i,m=R,S;i\neq m
\end{aligned}
$$

where E is the expectations operator. As for the effect of changes in q and μ on expected utility, first note that

$$
\begin{aligned}
(A12a)\frac{\partial\pi^i(q,\mu)}{\partial q} &= \begin{cases} 1-\mu>0, i=R; \\ \mu>0, i=S \end{cases};\\
(A12b)\frac{\partial\pi^i(q,\mu)}{\partial\mu} &= \begin{cases} 1-q\geq 0, i=R; \\ -(1-q)\leq 0, i=S \end{cases}.
\end{aligned}
$$

That is, an increase in the probability of winning the election always increases the probability that the preferences of the first period government are decisive in period 2 as well (remember that we assume that $\mu\in(0,1)$). If a government of type i wins the election, it is certain that its preferences will determine period 2 policies. While this probability is positive even if it loses the election, it is smaller. Therefore, a type i government gains from becoming more certain to continue in power. Naturally, while an increase in the probability that the period 2 government is of type R increases the probability that the preferences of a first period government of type R are decisive in period 2, it decreases this probability for a type S period 1 government.

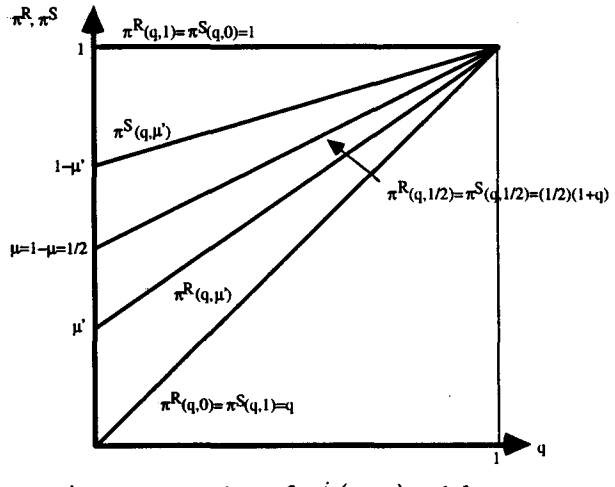

Figure A1: properties of $\pi^i(q,\mu)$ with respect to q

We have $sign\left[\pi^R(q,\mu)-\pi^S(q,\mu)\right]=sign\left(\mu-\frac{1}{2}\right)$. Hence, as long as $\mu\neq\frac{1}{2}$, $\pi^R(q,\mu)\neq\pi^S(q,\mu)$. Also note that $\pi^R(1,\mu)=\pi^R(q,1)=\pi^S(q,0)=\pi^S(1,\mu)=1$. Some examples are given in figures A1 and A2.

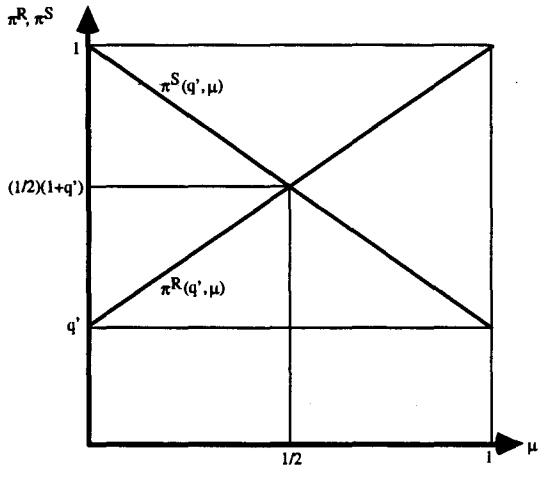

Figure A2: properties of $\pi^i(q,\mu)$with respect to μ

>From (A10)',

$$(A13)\frac{\partial W^i(b_2;q,\mu)}{\partial\pi^i(q,\mu)}=\frac{\partial E_2^i(\eta;q,\mu)}{\partial\pi^i(q,\mu)}=\eta^{ii}-\eta^{im}>0;i,m=R,S,i\neq m.$$

That is, an increase in the probability that your type of preferences determines period 2 policies increases your expected utility. Hence, the signs of the derivatives of expected utility with respect to q and μ are the same as the signs of the derivatives of $\pi^i(q,\mu)$ with respect to these parameters.

It follows from $(A9)$ and $(A10)'$ that

$$\begin{aligned}(A14)\frac{\partial W^i(b_2;q,\mu)}{\partial b_2} &= \pi^i(q,\mu)\frac{\partial V_2^i(b_2;i)}{\partial b_2}+\left[1-\pi^i(q,\mu)\right]\frac{\partial V_2^i(b_2;m)}{\partial b_2}\\ &= -\frac{(1+r)}{\Phi_2(b_2)}<0;i,m=R,S,i\neq m.\end{aligned}$$

This derivative is the (negative of) the marginal cost of public debt in terms of reduced period 2 private and public consumption, measured in units of period 2 utility. It is, of course, proportional to the marginal expected utility of resources in period 2, with the opposite sign.

7.1.3 Period 1 Policies

The decision problem for a type i first period government given a probability of re-election q is

$$\underset{\tau_1, g_1, b_2}{Max}\ U^i(c_1, g_1) + \delta W^i(b_2; q, \mu)$$

subject to

$$(A15)\ (1-\tau_1)\, y = c_1$$

and

$$(A16)\tau_1 y + b_2 = g_1 + (1+r)\, b_1.$$

Combining the constraints and substituting the result into the objective function, we are left with a maximisation problem in two variables, say g_1 and b_2:

$$\underset{g_1, b_2}{Max}\ \Omega^i(c_1, g_1, b_2; q, \mu) = U^i(\Phi_1(b_2) - g_1, g_1) + \delta W^i(b_2; q, \mu).$$

The first-order conditions are

$$\begin{aligned}
(A17a)\frac{\partial \Omega^i(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu)}{\partial g_1} &= \frac{\partial U^j(\Phi_1(b_2^{i*}) - g_1^{i*}, g_1^{i*})}{\partial g_1} \\
&= -\frac{\alpha^i}{\Phi_1(b_2^{i*}) - g_1^{i*}} + \frac{1-\alpha^i}{g_1^{i*}} = 0; \\
(A17b)\frac{\partial \Omega^i(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu)}{\partial b_2} &= \frac{\partial U^j(\Phi_1(b_2^{i*}) - g_1^{i*}, g_1^{i*})}{\partial b_2} + \delta \frac{\partial W^i(b_2^{i*}; q, \mu)}{\partial b_2} \\
&= \frac{\alpha^i}{\Phi_1(b_2^{i*}) - g_1^{i*}} - \frac{\delta(1+r)}{\Phi_2(b_2^{i*})} = 0.
\end{aligned}$$

In combination with the resource constraints this yields

$$\begin{aligned}
(A18a)b_2^{i*} &= \left(\frac{1}{1+\delta}\right)\left(\frac{y}{1+r}\right) \\
&\quad - \left(\frac{\delta}{1+\delta}\right)[y - (1+r)\, b_1];
\end{aligned}$$

$$
\begin{aligned}
(A18b) g_1^{i*} &= \left(1-\alpha^i\right)\Phi_1\left(b_2^{i*}\right); \\
(A18c) \tau_1^{i*} &= 1-\left[\frac{\alpha^i \Phi_1\left(b_2^{i*}\right)}{y}\right]; \\
(A18d) c_1^{i*} &= \alpha^i \Phi_1\left(b_2^{i*}\right).
\end{aligned}
$$

Note that the optimal debt level does not contain any parameters specific to i. Thus, $b_2^{R*} = b_2^{S*} \equiv b_2^*$. Define $\Psi = \frac{1}{1+\delta}$. Ψ can interpreted as the optimal share of total consumable resources that is spent in period 1 and similarly, $1-\Psi$ is the part that incumbent governments of both types optimally spends in period 2 (measured in present value terms), c.f. $\frac{\Phi_2\left(b_2^*\right)}{1+r} = \left(1-\Psi\right)\Phi$:

$$
\begin{aligned}
(A19a) \Phi_1\left(b_2^{i*}\right) &= \left(\frac{1}{1+\delta}\right)\Phi \equiv \Psi\Phi; \\
(A19b) \Phi_2\left(b_2^{i*}\right) &= \left(\frac{(1+r)\,\delta}{1+\delta}\right)\Phi \equiv (1+r)\left(1-\Psi\right)\Phi.
\end{aligned}
$$

Combining this with $(A18)$, we have

$$
\begin{aligned}
(A18a)' b_2^{i*} &= \Psi\Phi - \left[y-(1+r)\,b_1\right]; \\
(A18b)' g_1^{i*} &= \left(1-\alpha^i\right)\Psi\Phi; \\
(A18c)' \tau_1^{i*} &= 1-\left[\frac{\alpha^i \Psi\Phi}{y}\right]; \\
(A18d)' c_1^{i*} &= \alpha^i \Psi\Phi.
\end{aligned}
$$

Note that the optimal solutions do not depend on the probability that i's preferences determine period 2 policies.

The second derivatives of the objective function are

$$
\begin{aligned}
(A20a) \frac{\partial^2 \Omega^i\left(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu\right)}{\partial\left(g_1\right)^2} &= -\left[\frac{\alpha^i}{\left(\Phi_1\left(b_2^{i*}\right)-g_1^{i*}\right)^2}+\frac{1-\alpha^i}{\left(g_1^{i*}\right)^2}\right] < 0; \\
(A20b) \frac{\partial^2 \Omega^i\left(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu\right)}{\partial\left(b_2\right)^2} &= -\left[\frac{\alpha^i}{\left(\Phi_1\left(b_2^{i*}\right)-g_1^{i*}\right)^2}+\frac{\delta\,(1+r)}{\left(\Phi_2\left(b_2^{i*}\right)\right)^2}\right] < 0; \\
(A20c) \frac{\partial^2 \Omega^i\left(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu\right)}{\partial g_1 \partial b_2} &= \left[\frac{\alpha^i}{\left(\Phi_1\left(b_2^{i*}\right)-g_1^{i*}\right)^2}\right] > 0.
\end{aligned}
$$

Moreover (suppressing arguments of functions for notational economy),

$$(A21)\left[\frac{\partial^2\Omega^i}{\partial(g_1)^2}\right]\left[\frac{\partial^2\Omega^i}{\partial(b_2)^2}\right]\left[\frac{\partial^2\Omega^i}{\partial g_1\partial b_2}\right]^2$$

$$= \left[\frac{\alpha^i}{(\Phi_1 - g_1^{i*})^2} + \frac{1-\alpha^i}{(g_1^{i*})^2}\right]\left[\frac{\alpha^i}{(\Phi_1 - g_1^{i*})^2} + \frac{\delta(1+r)}{(\Phi_2)^2}\right] - \left[\frac{\alpha^i}{(\Phi_1 - g_1^{i*})^2}\right]^2 > 0.$$

Thus, we see that the second-order conditions all hold at the optimum. In fact, the objective functions is globally concave, and so we have found a unique optimum.

Suppose now that the government's end-of-period debt cannot exceed B. Adding the constraint $b_2 \leq B$ to the above maximisation problem obviously does not change the optimum if $b_2^* \leq B$. If $b_2^* > B$, the constraint is strictly binding at the optimum. Thus, $b_2 = B$. It is easily seen that the constraint does not change the functional relationship between optimal period 1 private and public consumption and the amount of resources available in this period. Hence, the optimal levels of these variables are now $\overline{c}_1^i = \alpha^i\Phi_1(B)$ and $\overline{g}_1^i = (1-\alpha^i)\Phi_1(B)$.

7.1.4 Properties of the Two-Period Utility Functions

The two-period "indirect" expected utility of i is the maximum value function $\omega^i(q,\mu) \equiv \Omega^i(c_1^{i*}, g_1^{i*}, b_2^{i*}; q, \mu)$. By definition, $\omega^i(q,\mu) \geq \Omega^i(c_1, g_1, b_2; q, \mu)$, $\forall\{c_1, g_1, b_2\}$. In fact, because the optimal choices are unique, the inequality is strict except at the optimum. The following lemma follows straightforwardly from previous results:

Lemma A1:

$\omega^i(q',\mu') > \omega^i(q'',\mu'') \Leftrightarrow \pi^i(q',\mu') > \pi^i(q'',\mu''), i = R, S.$

Proof: We have $\frac{\partial\omega^i(q,\mu)}{\partial\pi^i(q,\mu)} = \frac{\partial E_2^i(\eta;q,\mu)}{\partial\pi^i(q,\mu)} = \eta^{ii} - \eta^{im} > 0, i = R, S; i \neq m$ c.f. (A13). Q.E.D.

In words, *Lemma A1* says that i's total expected "indirect" utility is increasing in the probability that its preferences are decisive for period 2 policies. Accordingly, the derivatives of $\omega^i(q,\mu)$ with respect to q and μ have the same sign as the derivatives of $\pi^i(q,\mu)$ with respect to these variables.

If the government is credit-constrained, we can define a maximum-value function $\overline{\omega}^i(q,\mu,B) \equiv \Omega^i(c_1^{i*}, g_1^{i*}, B; q, \mu)$. Since $\Omega^i(c_1, g_1, b_2; q, \mu)$ is a strictly

concave function of b_2, $\overline{\omega}^i(q,\mu,B) \leq \omega^i(q,\mu)$, with equality only at $B = b_2^*$. Lemma A1 obviously applies in this case too.

7.1.5 Voter Behaviour

Voters can choose between voting for the incumbent government or voting for the challenger. They make their choice after observing the incumbent government's policies. These policies affect the voters' expected period 2 utilities through the debt level, which determines the amount of resources left over for period 2 private and public consumption, and, possibly, the voters' beliefs about which type of government the incumbent is. Denote the ex post probability that the incumbent government is of type R by ρ. Voter h then expects to get a period 2 utility of

$$(A22)\rho V_2^h(b_2;R) + (1-\rho)V_2^h(b_2;S)$$

if the incumbent is re-elected. If the challenger wins the election, voter h expects to get

$$(A23)\mu V_2^h(b_2;R) + (1-\mu)V_2^h(b_2;S)$$

It is assumed that all voters participate in the election. Because there is a continuum of voters, no voter can affect the probability that the incumbent government is re-elected. All voters therefore vote sincerely for the alternative that promises the highest level of period 2 utility given their beliefs, which are identical. In other words, all voters compare $(A22)$ and $(A23)$ and vote for the incumbent if $(A22) > (A23)$ and for the challenger if $(A22) < (A23)$. If these are equal, we may assume without loss of generality that all voters toss a fair coin to determine their ballot decision. This is what all voters will do in a pooling equilibrium because then $\rho = \mu$, and hence $(A22) = (A23)$ for *all* voters. Thus, in a pooling equilibrium, the probability of the incumbent government being re-elected is equal to $\frac{1}{2}$.

If $\rho \neq \mu$, it is possible to find a set of voters H with a weight α^H on the utility of private consumption such that a) all voters for which $\alpha^h < \alpha^H$ vote for the incumbent if it is believed that this government is more likely to be of type S than the challenger and vote for the challenger if it is the other way around; and b) all voters for which $\alpha^h > \alpha^H$ vote for the incumbent if it is believed that the incumbent is more likely to be type R than the challenger is and vote for the challenger if the converse is true. This set of indifferent

voters, which will have mass zero, have preferences such that $(A22) = (A23)$. When $\rho \neq \mu$, this is equivalent to $V_2^H(b_2; R) = V_2^H(b_2; S)$, c.f. $(A24)$:

$$(A24)\,(\rho - \mu)\left[V_2^H(b_2; R) - V_2^H(b_2; S)\right] = 0.$$

Because $V_2^H(b_2; R) = V_2^h(b_2; S) \Leftrightarrow \eta^{HR} = \eta^{HS}$, α^H is given by

$$(A25)\alpha^H = \frac{\ln\left(1-\alpha^S\right) - \ln\left(1-\alpha^R\right)}{\left[\ln\alpha^R - \ln\alpha^S\right] + \left[\ln\left(1-\alpha^S\right) - \ln\left(1-\alpha^R\right)\right]}.$$

Obviously, as we assume $0 < \alpha^S < \alpha^R < 1$, $\alpha^H \in (0,1)$. We now proceed to demonstrate that $\alpha^H \in \left(\alpha^S, \alpha^R\right)$. First note that for $\alpha^h = \alpha^R$, we must have $V_2^h(b_2; R) > V_2^h(b_2; S)$ while for $\alpha^h = \alpha^S$ it must be the case that $V_2^h(b_2; R) < V_2^h(b_2; S)$. Moreover,

$$\begin{aligned}
(A26a)\frac{\partial\left[V_2^h(b_2; R) - V_2^h(b_2; S)\right]}{\partial\alpha^h} &= \left[\ln\alpha^R - \ln\alpha^S\right] \\
+\left[\ln\left(1-\alpha^S\right) - \ln\left(1-\alpha^R\right)\right] &> 0; \\
(A26b)\frac{\partial^2\left[V_2^h(b_2; R) - V_2^h(b_2; S)\right]}{\partial\left(\alpha^h\right)^2} &= 0.
\end{aligned}$$

Therefore, there must exist a unique $\alpha^H \in \left(\alpha^S, \alpha^R\right)$ such that $V_2^h(b_2; R) = V_2^h(b_2; S)$, c.f. figure A3. All voters who value private consumption more than this prefer the incumbent to the challenger if $\rho > \mu$ and the challenger to the incumbent if $\rho < \mu$. On the other hand, all voters who attaches a weight to the utility of private consumption which is smaller than α^H prefer the incumbent to the challenger if $\rho < \mu$ and the challenger to the incumbent if $\rho > \mu$.

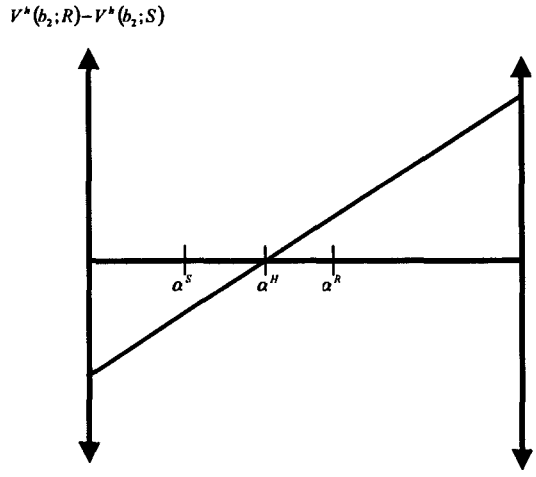

Figure A3: preferences of group of indifferent voters

An incumbent government of type i will be re-elected if more than half of the electorate prefers it to the challenger. More than half the electorate prefers the incumbent if the median of the distribution of voter preferences, α^M, lies on the same side of α^H as do α^i. Since the position of the median is uncertain, the probability of more than half the electorate preferring i to the challenger is non-degenerate. Using the results just derived, we thus have

$$(A27)q^{isep} \equiv \begin{cases} prob\left(\alpha^H < \alpha^M\right) = 1 - A\left(\alpha^H\right), i = R; \\ prob\left(\alpha^M \leq \alpha^H\right) = A\left(\alpha^H\right), i = S. \end{cases}$$

Finally, note that as preferences are homothetic, α^H does not depend on the level of resources available in period 2. Thus, it is independent of whether the government is credit-constrained or not.

8 Appendix B

8.1 Existence of Simple Separating Equilibria

In the following, I will label the type trying to separate out as type k and denote the potential mimicker by type l. To prove existence, it suffices to prove that there exists a point such that

$$(B1a)\Omega^k\left(c_1,g_1,b_2;q^{ksep},\mu\right) \geq \omega^k\left(q^{lsep},\mu\right);$$
$$(B1b)\Omega^l\left(c_1,g_1,b_2;q^{ksep},\mu\right) \leq \omega^l\left(q^{lsep},\mu\right).$$

That is, we need only prove that there exists period 1 policies such that if voters believe that the government is of type k if and only if these policies are chosen and believe that the government is of type l otherwise, then k prefers choosing them to choosing any other set of policies (which would all lead to it being mistaken for l) and l prefers to pick $\left\{c_1^{l*},g_1^{l*},b_2^*\right\}$ instead of this set of policies (and it prefers $\left\{c_1^{l*},g_1^{l*},b_2^*\right\}$ to any other set of policies since this is the best that it can do for a given probability of re-election).

The simplest case arises if there are parameter values such that a government of type k can separate itself from l by choosing its "first-best" policies. I will call this simple separating equilibria. The beliefs specified in the main text are then obviously a special case of the beliefs specified here.

A trivial case where both types will choose there "first-best" policies is when $q^{ksep}=q^{lsep}=\frac{1}{2}$. Obviously in this case l does not have an incentive to mimic k and k does not have an incentive to actively separate out, so the only equilibrium is the one where both types play their "first-best" policies.

In the more interesting cases where $q^{ksep}>\frac{1}{2}>q^{lsep}$, I will express the conditions where this equilibrium survives in terms of a cut-off rate for the discount factor which has the property that for discount factors less than or equal to this value, l will at least weakly prefer not to mimic k when k plays $\left\{g_1^{k*},b_2^*\right\}$. It is of course found by equating $\Omega^l\left(g_1^{k*},b_2^*;q^{ksep},\mu\right)$ and $\omega^l\left(q^{lsep},\mu\right)$. This yields:

$$(B2)\overline{\delta}^l\left(q^{ksep},\mu\right)=\frac{1}{\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)}.$$

Note that $\overline{\delta}^l\left(q^{ksep},\mu\right)$ is independent of the degree of political polarisation, i.e., the difference in preferences between k and l. This is because the gain from mimicking is proportional to the gain from having one's own preferences determine period 2 policies and the loss from mimicking is equal to this gain in this type of equilibrium. In period 2, any type of government chooses its first-best policies, and therefore the gain from one's own preferences being decisive is equal to the difference in utility between the two first-best policies. In a simple separating equilibrium, k chooses its first-best policies, and so must l if it is to fool the voters.

Furthermore, note that $\overline{\delta}^{l}\left(q^{ksep},\mu\right)$ is independent of the intertemporal distribution of resources. This is due to the strong separability of the indirect utility functions: $\omega^{i}\left(q,\mu\right)=\eta^{ii}+\ln\Psi\Phi+E^{i}\left(\eta;q,\mu\right)+\ln\left(1+r\right)\left(1-\Psi\right)\Phi$ and $\overline{\omega}^{i}\left(q,\mu\right)=\eta^{ii}+\ln\Phi_{1}\left(B\right)+E^{i}\left(\eta;q,\mu\right)+\ln\Phi_{2}\left(B\right)$. Therefore, what follows applies whether the government is credit-constrained or not.

The properties of this cut-off rate are best studied case by case. When $q^{Ssep}>\frac{1}{2}>q^{Rsep}$, $k=S$ and $l=R$. The cut-off rate is then

$$(B3)\overline{\delta}^{R}\left(q^{Ssep},\mu\right)=\frac{1}{\left(2q^{Ssep}-1\right)\left(1-\mu\right)}.$$

We have

$$\begin{aligned}
(B4a)\frac{\partial\overline{\delta}^{R}\left(q^{Ssep},\mu\right)}{\partial q^{Ssep}} &= -\frac{2}{\left(2q^{Ssep}-1\right)^{2}\left(1-\mu\right)}<0;\\
(B4b)\frac{\partial\overline{\delta}^{R}\left(q^{Ssep},\mu\right)}{\partial\mu} &= \frac{1}{\left(2q^{Ssep}-1\right)\left(1-\mu\right)^{2}}>0;\\
(B4c)\lim_{q^{Ssep}\to\frac{1}{2}}\overline{\delta}^{R}\left(q^{Ssep},\mu\right) &= \infty;\ \lim_{q^{ksep}\to1}\overline{\delta}^{R}\left(q^{Ssep},\mu\right)=\frac{1}{1-\mu};\\
\lim_{\mu\to0}\overline{\delta}^{R}\left(q^{Ssep},\mu\right) &= \frac{1}{2q^{Ssep}-1};\lim_{\mu\to1}\overline{\delta}^{R}\left(q^{Ssep},\mu\right)=\infty.
\end{aligned}$$

The cut-off rate is declining in the probability that a government of type S wins the election because an increase in this probability makes it more tempting for a type R government to mimic a type S government. It is increasing in μ, the probability that a challenger is of type R. An increase in this probability makes it more likely that an R-government determines period 2 policies even if today's R-government loses the election, and as the incentive a type R first-period government has to mimic S stems from the "improvement" in period 2 policies that can be achieved by having an R-government in charge in the next period instead of an S-government, it is lower the higher μ is. This is underlined by the fact that the cut-off rate goes to infinity as μ approaches unity since if a first-period R-government is certain that the challenger has the same preferences as itself, it would have a dominant strategy of choosing first-period policies $\left\{c_{1}^{R*},g_{1}^{R*},b_{2}^{*}\right\}$. That the cut-off rate goes to infinity as the probabilities of each type of government winning the election is $\frac{1}{2}$ is just a confirmation of the claim made above that

there are no incentives for any type to deviate from its first-best policies in that case.

When $q^{Ssep} < \frac{1}{2} < q^{Rsep}$, $k = R$ and $l = S$. The cut-off rate is then

$$(B5)\overline{\delta}^{S}\left(q^{Rsep},\mu\right) = \frac{1}{\left(2q^{Rsep}-1\right)\mu}.$$

Its properties are

$$\begin{aligned}
(B6a)\frac{\partial\overline{\delta}^{S}\left(q^{Rsep},\mu\right)}{\partial q^{Rsep}} &= -\frac{2}{\left(2q^{Rsep}-1\right)^{2}\mu} > 0;\\
(B6b)\frac{\partial\overline{\delta}^{S}\left(q^{Rsep},\mu\right)}{\partial \mu} &= -\frac{1}{\left(2q^{Rsep}-1\right)\mu^{2}} > 0;\\
(B6c)\lim_{q^{Rsep}\to\frac{1}{2}}\overline{\delta}^{S}\left(q^{Rsep},\mu\right) &= \infty;\ \lim_{q^{Rsep}\to 1}\overline{\delta}^{S}\left(q^{Rsep},\mu\right) = \frac{1}{\mu};\\
\lim_{\mu\to 0}\overline{\delta}^{S}\left(q^{Rsep},\mu\right) &= \infty;\lim_{\mu\to 1}\overline{\delta}^{S}\left(q^{Rsep},\mu\right) = \frac{1}{2q^{Rsep}-1}.
\end{aligned}$$

This cut-off rate is of course increasing in the probability that a government of type S wins the election as an increase in this probability makes it less imperative for an S government to hide its type. It is decreasing in μ because an increase in this probability makes it less likely that an S-government determines period 2 policies even if today's S-government loses the election. It then makes winning the election more important for a first-period S-government. Once again, the impact of variations in the probability that the challenger is of the same type as the incumbent government is reflected in the fact that the cut-off rate goes to infinity as this probability goes to unity. When it is an S government which has the weakest electoral position, this happens when μ approaches zero because then $1-\mu$ approaches unity. In such a case, an incumbent S-government would have a dominant strategy of choosing first period policies $\left\{c_1^{S*}, g_1^{S*}, b_2^{*}\right\}$. Once more, we see that the same applies for equal probabilities of winning the election for the two types.

The results derived in this section are summarised in the following proposition:

Proposition B1:

$\exists\overline{\delta}^{l}\left(q^{ksep},\mu\right) > 0$ such that $\forall\delta \leq \overline{\delta}^{l}\left(q^{ksep},\mu\right)$, simple separating equilibria exist; while $\forall\delta > \overline{\delta}^{l}\left(q^{ksep},\mu\right)$, simple separating equilibria do not exist.

8.2 Removing Dominated Strategies for l

For some parameter configurations, pooling equilibria might exist for $\delta \leq \overline{\delta}^{l}\left(q^{ksep}, \mu\right)$. However, all of these rely on l playing a dominated strategy, namely $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$. Since any policy pair that satisfies (B1a) and (B1b) gives l at the most no more than it gets by choosing $\left\{c_1^{l*}, g_1^{l*}, b_2^{*}\right\}$ and accepting that its type is revealed, any strategy that requires l to play these is at least weakly dominated by playing $\left\{c_1^{l*}, g_1^{l*}, b_2^{*}\right\}$. If these strategies are removed for l, k is free to choose between the best of the potential separating equilibrium policies and the pooling equilibrium policies. I shall demonstrate that it will choose its "first-best" policies. Hence, the only pure-strategy Perfect Bayesian Equilibrium in non-dominated strategies is the unique separating equilibrium.

By Proposition B1, $\Omega^{l}\left(c_1^{k*}, g_1^{k*}, b_2^{*}; q^{ksep}, \mu\right) \leq \omega^{l}\left(q^{lsep}, \mu\right)$ in the separating equilibrium. That is, the maximum pay-off that l can get from playing $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ is never greater than the lowest pay-off it can get from playing $\left\{c_1^{l*}, g_1^{l*}, b_2^{*}\right\}$. This is the definition of a (weakly) dominated strategy. On the other hand, for k, the maximum utility from playing $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ is $\omega^{k}\left(q^{ksep}, \mu\right)$, which is also the highest attainable level of utility for it given voter preferences (c.f. *Lemma A1*). So, for k, $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ is not dominated by any other combination of policies. Therefore, upon observing $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$, voters should infer that the government is of type k. k is then free to choose this policy instead of the purported pooling equilibrium policies if it so wishes. The maximum utility that k can get in a pooling equilibrium is $\omega^{k}\left(\frac{1}{2}, \mu\right) \equiv \Omega^{k}\left(c_1^{k*}, g_1^{k*}, b_2^{*}; \frac{1}{2}, \mu\right)$. It can be shown that $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ is not a pooling equilibrium until $\delta = 2\overline{\delta}^{l}\left(q^{ksep}, \mu\right)$ (since the gain to l from getting a probability of re-election of $\frac{1}{2}$ instead of q^{lsep} is only half the gain from having q^{ksep} instead of q^{lsep}). It follows that a pooling equilibrium policy $\left\{c_1^{P}, g_1^{P}, b_2^{P}\right\}$ gives k a level of utility $\Omega^{k}\left(c_1^{P}, g_1^{P}, b_2^{P}; \frac{1}{2}, \mu\right) < \omega^{k}\left(\frac{1}{2}, \mu\right)$. Moreover, by *Lemma A1*, $\omega^{k}\left(q^{ksep}, \mu\right) > \omega^{k}\left(\frac{1}{2}, \mu\right)$. Hence, the purported equilibrium cannot be sustained.

Corollary 3 in the main text follows from this result as it demonstrates that l plays $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ with probability zero and k plays $\left\{c_1^{k*}, g_1^{k*}, b_2^{*}\right\}$ with probability one. In fact, it can be shown that the current framework rules out all non-trivial mixed strategy equilibria, even for $\delta > \overline{\delta}^{l}\left(q^{ksep}, \mu\right)$, because the probability of winning the election is not a continuous function of the beliefs of voters.

The proof for the case when the government is credit-constrained is along the same lines, with B, $\overline{\omega}^l(q,\mu)$, and $\overline{\omega}^k(q,\mu)$ replacing b_2^*, $\omega^l(q,\mu)$, and $\omega^k(q,\mu)$, respectively.

9 Appendix D: More General Preference Structures

Suppose that voters and governments have the following utility functions

$$(D1)U^h(c_t,g_t)=\alpha\frac{(c_t)^{1-\sigma}}{1-\sigma}+(1-\alpha)\frac{(g_t)^{1-\sigma}}{1-\sigma},$$

where $\alpha^h\in(0,1)$ and $\sigma>0$ but $\sigma\neq 1$. The preference structure used in the main text is the limit of (D1) as $\sigma\to 1$. Since these preferences imply that in general $b_2^{R*}(q,\mu)\neq b_2^{S*}(q,\mu)$, I assume $\delta=\frac{1}{1+r}$ to focus on strategic political incentives to have different amounts of resources in the two periods. Moreover, assuming $r\geq 0$ implies that we have a situation comparable to $\delta\leq\overline{\delta}^l\left(q^{ksep},\mu\right)$ above.

9.1 Period 2 Policies

A type j period 2 government maximises $U^j(c_2,g_2)=\alpha^j\frac{(c_2)^{1-\sigma}}{1-\sigma}+(1-\alpha^j)\frac{(g_2)^{1-\sigma}}{1-\sigma}$ subject to the budget constraints of the private and public sectors. It can be shown that the solution to this optimisation problem is $c_2^{j*}(b_2)=\gamma^j\Phi_2(b_2)$ and $g_2^{j*}(b_2)=(1-\gamma^j)\Phi_2(b_2)$, where $\gamma^j=\frac{\left(\alpha^j\right)^{\frac{1}{\sigma}}}{\left(\alpha^j\right)^{\frac{1}{\sigma}}+\left(1-\alpha^j\right)^{\frac{1}{\sigma}}}$. In turn, substituting $c_2^{j*}(b_2)$ into the budget constraint of the representative consumer, the optimal tax rate follows: $\tau_2^{j*}(b_2)=1-\left[\frac{\gamma^j\Phi_2(b_2)}{y}\right]$.[24] It is straightforward to verify that $\gamma^R\gtreqless\gamma^S\Leftrightarrow\alpha^R\gtreqless\alpha^S$. Therefore, $g_2^{R*}(b_2)<g_2^{S*}(b_2)$ and $c_2^{R*}(b_2)>c_2^{S*}(b_2)$.

9.2 Voter Preferences

The preferences specified in $(D1)$ are homothetic, and the nature of the preferences of the set of indifferent voters is thus unchanged by the alteration

[24]It should be noted that the objective function is strictly concave globally. Thus, we have found a unique optimum.

of the utility functions:

$$(D2)\alpha^H = \frac{\left(1-\gamma^S\right)^{1-\sigma} - \left(1-\gamma^R\right)^{1-\sigma}}{\left(\gamma^R\right)^{1-\sigma} - \left(\gamma^S\right)^{1-\sigma} + \left[\left(1-\gamma^S\right)^{1-\sigma} - \left(1-\gamma^R\right)^{1-\sigma}\right]},$$

which is independent of $\Phi_2(b_2)$. The procedure used above can be applied to demonstrate that $\alpha^H \in (\alpha^S, \alpha^R)$.

9.3 Period 1 Policies Given $\pi^i(q,\mu)$

Defining the indirect utility function $V_2^i(b_2;j) \equiv U^i\left(c_2^{j*}(b_2), g_2^{j*}(b_2)\right)$ and the expected indirect utility of i $W^i(b_2;q,\mu) = \pi^i(q,\mu)\, V_2^i(b_2;i) + [1-\pi^i(q,\mu)]\, V_2^i(b_2;m)$ in the same way as above and combining the period 1 budget constraints, maximisation of $\Omega^i(c_1,g_1,b_2;q,\mu) = U^i(c_1,g_1) + \delta W^i(b_2;q,\mu)$ results in the following first-order conditions:[25]

$$\begin{aligned}(D3a) - \alpha^i\left(\Phi_1(b_2) - g_1\right)^{-\sigma} + \left(1-\alpha^i\right)(g_1)^{-\sigma} &= 0;\\ (D3b)\alpha^i\left(\Phi_1(b_2) - g_1\right)^{-\sigma} - \delta(1+r)\frac{\partial W^i(b_2;q,\mu)}{\partial \Phi_2} &= 0.\end{aligned}$$

It is easily seen that the optimal levels of private and public consumption have the same form as in period 2: $c_1^{i*}(b_2) = \gamma^i \Phi_1(b_2)$ and $g_1^{i*}(b_2) = (1-\gamma^i)\Phi_1(b_2)$. However, b_2 is now endogenous. Making use of the fact that the objective functions are homothetic, we can write $V_2^i(b_2;j) = \eta^{ij}\frac{[\Phi_2(b_2)]^{1-\sigma}}{1-\sigma}$. Therefore, $\frac{\partial W^i(b_2;q,\mu)}{\partial \Phi_2} = \left[\pi^i(q,\mu)\,\eta^{ii} + [1-\pi^i(q,\mu)]\,\eta^{im}\right][\Phi_2(b_2)]^{-\sigma}$, $i,m = R,S; i \neq m$. Substituting $c_1^{i*}(b_2)$ into $(D3b)$, we get the optimal ratio of resources in period 2 to resources in period 1:

$$(D4)\frac{\Phi_2\left(b_2^{i*}\right)}{\Phi_1\left(b_2^{i*}\right)} = \left[\frac{E^i(\eta;q,\mu)}{\eta^{ii}}\right]^{\frac{1}{\sigma}} \equiv \varphi^i(q,\mu),$$

where $E^i(\eta;q,\mu) \equiv [\pi^i(q,\mu)\,\eta^{ii} + [1-\pi^i(q,\mu)]\,\eta^{im}]$. From (D4), the optimal debt follows:

$$(D5)b_2^{i*}(q,\mu) = \Psi^i(q,\mu)\,\Phi - [y - (1+r)\,b_1].$$

[25] It can be shown that the objective function is globally concave, and hence, that the optimal choices are unique.

$\Psi^i(q,\mu) = \frac{1+r}{(1+r)+\varphi^i(q,\mu)}$ can be interpreted as the optimal share of resources to spend in period 1 according to the preferences of i given q and μ, c.f. $\Phi_1(b_2^{i*}) = \Psi^i(q,\mu)\Phi$ and $\Phi_2(b_2^{i*}) = (1+r)[1-\Psi^i(q,\mu)]\Phi$. We see that $\frac{\partial b_2^{i*}(q,\mu)}{\partial \pi^i(q,\mu)} = \frac{\partial b_2^{i*}(q,\mu)}{\partial \Psi^i(q,\mu)}\frac{\partial \Psi^i(q,\mu)}{\partial \varphi^i(q,\mu)}\frac{\partial \varphi^i(q,\mu)}{\partial E^i(\eta;q,\mu)}\frac{\partial E^i(\eta;q,\mu)}{\partial \pi^i(q,\mu)}$. The first of these partial derivatives is clearly positive, the second is negative, and the third can be seen to be positive. Hence, $sign\frac{\partial b_2^{i*}(q,\mu)}{\partial \pi^i(q,\mu)} = -sign\frac{\partial E^i(\eta;q,\mu)}{\partial \pi^i(q,\mu)}$. We have

$$(D6)\frac{\partial E^i(\eta;q,\mu)}{\partial \pi^i(q,\mu)} = \eta^{ii} - \eta^{im} \begin{cases} > 0, \sigma < 1; \\ < 0, \sigma > 1. \end{cases}$$

The signs follow from the fact that the objective function is of the form $U(c_t,g_t) = \left(\frac{1}{1-\sigma}\right)\left[\alpha(c_t)^{1-\sigma} + (1-\alpha)(g_t)^{1-\sigma}\right]$. When $\sigma < 1$, the optimal combination of c_t and g_t from the perspective of a government of a certain type *maximises* $\left[\alpha(c_t)^{1-\sigma} + (1-\alpha)(g_t)^{1-\sigma}\right]$. Hence, $\eta^{ii} > \eta^{im}$. But when $\sigma > 1$, the optimal allocation *minimises* $\left[\alpha(c_t)^{1-\sigma} + (1-\alpha)(g_t)^{1-\sigma}\right]$. Therefore, $\eta^{ii} < \eta^{im}$. It follows that

$$(D7)\frac{\partial b_2^{i*}(q,\mu)}{\partial \pi^i(q,\mu)} \begin{cases} < 0, \sigma < 1; \\ > 0, \sigma > 1. \end{cases}$$

It is easily seen that for $\pi^i(q,\mu) = 1$, $\varphi^i(q,\mu) = 1$. This is due to the fact that I have assumed $\delta = \frac{1}{1+r}$ in order to remove any economic incentive to have $\Phi_1 \neq \Phi_2$. It follows that for $\pi^i(q,\mu) < 1$, $\varphi^i(q,\mu) < 1$ when $\sigma < 1$. That is, relative to the case where $\pi^i(q,\mu) = 1$, there is *overaccumulation* of public debt. Conversely, when $\sigma > 1$, $\varphi^i(q,\mu) > 1$ for $\pi^i(q,\mu) < 1$. Hence, political uncertainty leads to *underaccumulation* of public debt. These results can also be derived by noting that the marginal utility of future funds, $\frac{\partial W^i(b_2;q,\mu)}{\partial \Phi_2}$, is increasing (decreasing) in $\pi^i(q,\mu)$ when $\sigma < 1$ ($\sigma > 1$).

9.4 Proof of the Existence of the Simple Separating Equilibrium

Define the maximum-value function $\omega^i(q,\mu) \equiv \Omega^i(c_1^{i*}(q,\mu), g_1^{i*}(q,\mu), b_2^{i*}(q,\mu); q,\mu)$. By definition, $\omega^i(q,\mu) \geq \Omega^i(c_1,g_1,b_2;q,\mu), \forall \{c_1,g_1,b_2\}$. In fact, as the optimum is unique, the inequality is strict except at $\{c_1^{i*}(q,\mu), g_1^{i*}(q,\mu), b_2^{i*}(q,\mu)\}$. In particular, $\omega^i(q,\mu) > \Omega^i(\gamma^i\Phi_1(b_2^{m*}(q,\mu)), (1-\gamma^i)\Phi_1(b_2^{m*}(q,\mu)), b_2^{m*}(q,\mu); q,\mu)$, $i \neq m$.

Let k denote the type with an electoral advantage and let l denote the other type. I will demonstrate that

$$\begin{aligned} & \Omega^l\left(\gamma^l\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),\left(1-\gamma^l\right)\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{lsep},\mu\right) \\ > \; & \Omega^l\left(c_1^{k*}\left(q,\mu\right),g_1^{k*}\left(q,\mu\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{ksep},\mu\right). \end{aligned}$$

That is, I will demonstrate that l is better off choosing its optimal allocation of resources on private and public consumption given the debt level $b_2^{k*}\left(q^{ksep},\mu\right)$, even if this results in the low probability of re-election q^{lsep} and it could have increased its probability of re-election to q^{ksep} by "completely" mimicking k. Since l will be even better off when its probability of re-election is q^{lsep} if it chooses $b_2^{l*}\left(q^{lsep},\mu\right)$, l will not mimic k.

Using the definitions $V_t^i\left(b_2;j\right)=\eta^{ij}\frac{\left[\Phi_t(b_2)\right]^{1-\sigma}}{1-\sigma}$, we have

$$\begin{aligned} & \Omega^l\left(\gamma^l\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),\left(1-\gamma^l\right)\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{lsep},\mu\right) \\ \gtreqless \; & \Omega^l\left(c_1^{k*}\left(q,\mu\right),g_1^{k*}\left(q,\mu\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{ksep},\mu\right) \\ \Leftrightarrow \; & \left(\eta^{ll}-\eta^{lk}\right)\frac{\left[\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)\right]^{1-\sigma}}{1-\sigma} \\ \gtreqless \; & \delta\left[\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)\right]\left(\eta^{ll}-\eta^{lk}\right)\frac{\left[\Phi_2\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)\right]^{1-\sigma}}{1-\sigma} \\ \Leftrightarrow \; & 1\gtreqless\delta\left[\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)\right]\left[\frac{\Phi_2\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)}{\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)}\right]^{1-\sigma} \\ = \; & \delta\left[\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)\right]\left[\varphi^k\left(q^{ksep},\mu\right)\right]^{1-\sigma}. \end{aligned}$$

The last equivalence follows by making use of the fact that $sign\left(\eta^{ll}-\eta^{lk}\right)=-sign\left(1-\sigma\right)$. We have already noted that for $\sigma<1$ $(\sigma>1)$, $\varphi^i\left(q,\mu\right)\leq 1$ $\left(\varphi^i\left(q,\mu\right)\geq 1\right)$. Hence, $\left[\varphi^k\left(q^{ksep},\mu\right)\right]^{1-\sigma}\leq 1$. The assumptions $\delta=\frac{1}{1+r}$ and $r\geq 0$ ensure that $\delta\leq 1$. Finally, $\pi^l\left(q^{ksep},\mu\right)-\pi^i\left(q^{lsep},\mu\right)<1$ because there is always a strictly positive probability that the challenger is of type l, and thus that period 2 policies are chosen according to l's preferences even if it is not re-elected. Therefore, suppressing (some) functional arguments,

$$\begin{aligned} \omega^l\left(q^{lsep},\mu\right) & > \Omega^l\left(\gamma^l\Phi_1\left(b_2^{k*}\right),\left(1-\gamma^l\right)\Phi_1\left(b_2^{k*}\right),b_2^{k*};q^{lsep},\mu\right) \\ & > \Omega^l\left(c_1^{k*},g_1^{k*},b_2^{k*};q^{ksep},\mu\right) \end{aligned}$$

9.5 Proof of the Existence of the Simple Separating Equilibrium when Governments are Credit-Constrained

I define the credit constraint relative to the separating equilibrium policies of i, which are also its first-best policies given the probability of re-election it gets when its type is revealed to the voters. That is, when type i is credit-constrained, $b_2^{i*}\left(q^{isep},\mu\right) > B$, where B is the maximum debt level allowed. Thus, *for a given probability of re-election equal to* q^{isep}, the credit-constraint is binding at the optimum, and so $b_2^i = B$. Since optimal allocations of resources on private and public consumption always lie along the ray $\{\gamma^i\Phi_1(b_2),(1-\gamma^i)\Phi_1(b_2)\}$, $\overline{c}_1^i(B) = \gamma^i\Phi_1(B)$ and $\overline{g}_1^i(B) = (1-\gamma^i)\Phi_1(B)$. Define the maximum value function $\overline{\omega}^i(q,\mu,B) \equiv \Omega^i\left(\overline{c}_1^i(B),\overline{g}_1^i(B),B;q,\mu\right)$. Note that for $B < b_2^{i*}\left(q^{isep},\mu\right)$, $\frac{\partial\overline{\omega}^i\left(q^{isep},\mu,B\right)}{\partial B} > 0$ since the credit constraint is binding and $\Omega^i\left(\overline{c}_1^i(B),\overline{g}_1^i(B),B;q^{isep},\mu\right)$ is a strictly concave function of B with a unique optimum at $B = b_2^{i*}\left(q^{isep},\mu\right)$. Therefore, $B' < B'' \leq b_2^{i*}\left(q^{isep},\mu\right) \Leftrightarrow \overline{\omega}^i\left(q^{isep},\mu,B'\right) < \overline{\omega}^i\left(q^{isep},\mu,B''\right)$.

Suppose l is credit-constrained but not k: $B \in \left[b_2^{k*}\left(q^{ksep},\mu\right),b_2^{l*}\left(q^{lsep},\mu\right)\right)$. Because $\frac{\partial\overline{\omega}^i\left(q^{isep},\mu,B\right)}{\partial B} > 0$ on $\left[b_2^{k*}\left(q^{ksep},\mu\right),b_2^{l*}\left(q^{lsep},\mu\right)\right)$, $\arg\min\limits_{B\in\left[b_2^{k*}\left(q^{ksep},\mu\right),b_2^{l*}\left(q^{lsep},\mu\right)\right)}\overline{\omega}^l\left(q^{lsep},\mu,B\right) = b_2^{k*}\left(q^{ksep},\mu\right)$. I now demonstrate that

$$\overline{\omega}^l\left(q^{lsep},\mu,b_2^{k*}\left(q^{ksep},\mu\right)\right) > \Omega^l\left(c_1^{k*}\left(q^{ksep},\mu\right),g_1^{k*}\left(q^{ksep},\mu\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{ksep},\mu\right).$$

As $\overline{\omega}^l\left(q^{lsep},\mu,B\right) \geq \overline{\omega}^i\left(q^{lsep},\mu,b_2^{k*}\left(q^{ksep},\mu\right)\right), \forall B \in \left[b_2^{k*}\left(q^{ksep},\mu\right),b_2^{l*}\left(q^{lsep},\mu\right)\right)$, the proof is then complete.

We have

$$\begin{aligned}
& \overline{\omega}^l\left(q^{lsep},\mu,b_2^{k*}\left(q^{ksep},\mu\right)\right) \\
= \;& \Omega^l\left(\overline{c}_1^i\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),\overline{g}_1^i\left(b_2^{k*}\left(q^{ksep},\mu\right)\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{lsep},\mu\right) \\
\gtreqless \;& \Omega^l\left(c_1^{k*}\left(q^{ksep},\mu\right),g_1^{k*}\left(q^{ksep},\mu\right),b_2^{k*}\left(q^{ksep},\mu\right);q^{ksep},\mu\right) \\
\Leftrightarrow \;& \left(\eta^{ll}-\eta^{lk}\right)\frac{\left[\Phi_1\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)\right]^{1-\sigma}}{1-\sigma} \\
\gtreqless \;& \delta\left[\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)\right]\left(\eta^{ll}-\eta^{lk}\right)\frac{\left[\Phi_2\left(b_2^{k*}\left(q^{ksep},\mu\right)\right)\right]^{1-\sigma}}{1-\sigma} \\
\Leftrightarrow \;& 1 \gtreqless \delta\left[\pi^l\left(q^{ksep},\mu\right)-\pi^l\left(q^{lsep},\mu\right)\right]\left[\varphi^k\left(q^{ksep},\mu\right)\right]^{1-\sigma}.
\end{aligned}$$

It can be seen that this is exactly the same evaluation that was made in the last sub-section. Thus, $1 > \delta \left[\pi^l\left(q^{ksep},\mu\right) - \pi^l\left(q^{lsep},\mu\right)\right]\left[\varphi^k\left(q^{ksep},\mu\right)\right]^{1-\sigma}$.

Suppose now that k is credit-constrained but not l: $B \in \left[b_2^{l*}\left(q^{lsep},\mu\right), b_2^{k*}\left(q^{ksep},\mu\right)\right)$. Then k chooses $\left\{\gamma^k\Phi_1(B), \left(1-\gamma^k\right)\Phi_1(B), B\right\}$ as its "second-best" policies.[26] We have $\omega^l\left(q^{lsep},\mu\right) \geq \Omega^l\left(\gamma^l\Phi_1(b_2), \left(1-\gamma^l\right)\Phi_1(b_2), b_2; q^{lsep},\mu\right), \forall b_2$, so it suffices to prove that

$$\Omega^l\left(\gamma^l\Phi_1(B), \left(1-\gamma^l\right)\Phi_1(B), B; q^{lsep},\mu\right) > \Omega^l\left(\gamma^k\Phi_1(B), \left(1-\gamma^k\right)\Phi_1(B), B; q^{ksep},\mu\right)$$

Following the same procedure as above, the critical condition is

$$1 \gtreqless \delta\left[\pi^l\left(q^{ksep},\mu\right) - \pi^l\left(q^{lsep},\mu\right)\right]\left[\frac{\Phi_2(B)}{\Phi_1(B)}\right]^{1-\sigma}.$$

Since $B \in \left[b_2^{l*}\left(q^{lsep},\mu\right), b_2^{k*}\left(q^{ksep},\mu\right)\right)$, $\varphi^k\left(q^{ksep},\mu\right) < \frac{\Phi_2(B)}{\Phi_1(B)} < \varphi^l\left(q^{lsep},\mu\right)$. Furthermore, $b_2^{l*}\left(q^{lsep},\mu\right) < b_2^{k*}\left(q^{ksep},\mu\right) \Leftrightarrow \varphi^k\left(q^{ksep},\mu\right) < \varphi^l\left(q^{lsep},\mu\right)$, and when $\sigma < 1$ ($\sigma > 1$), $\varphi^i(q,\mu) \leq 1$ ($\varphi^i(q,\mu) \geq 1$) $\forall q$, with equality iff $q = 1$. Hence, we have $\varphi^k\left(q^{ksep},\mu\right) < \frac{\Phi_2(B)}{\Phi_1(B)} < \varphi^l\left(q^{lsep},\mu\right) < 1$ when $\sigma < 1$ and $1 \leq \varphi^k\left(q^{ksep},\mu\right) < \frac{\Phi_2(B)}{\Phi_1(B)} < \varphi^l\left(q^{lsep},\mu\right)$ when $\sigma > 1$. It follows that $1 > \delta\left[\pi^l\left(q^{ksep},\mu\right) - \pi^l\left(q^{lsep},\mu\right)\right]\left[\frac{\Phi_2(B)}{\Phi_1(B)}\right]^{1-\sigma}$, and we are done.

When both types are credit-constrained, $B < Min\left\{b_2^{l*}\left(q^{lsep},\mu\right), b_2^{k*}\left(q^{ksep},\mu\right)\right\}$. In the proposed separating equilibrium, the policies are

$$\left\{\left\{\gamma^l\Phi_1(B), \left(1-\gamma^l\right)\Phi_1(B), B\right\}, \left\{\gamma^k\Phi_1(B), \left(1-\gamma^k\right)\Phi_1(B), B\right\}\right\}$$

It is immediate from the proof of the last paragraph that $\overline{\omega}^l\left(q^{lsep},\mu,B\right) > \Omega^l\left(\gamma^k\Phi_1(B), \left(1-\gamma^k\right)\Phi_1(B), B; q^{ksep},\mu\right)$, which proves that l will not mimic k in this case either.

Moreover, in parallel to the case considered in the main text, $\left\{c_1^{k*}, g_1^{k*}, B\right\}$ is dominated for l (here: strictly) but not for k.

[26] Strictly speaking, of course, the government does not determine c directly, but uses the tax rate to achieve the optimal level of this variable. However, since the objective functions are defined over c and g, I focus on c and not on τ.

10 Appendix E: Politicians with Mixed Motives

Suppose that governments are not purely office-motivated, but also value a "gain from being in office", κ, which could be related to the power, prestige, or other perks of office. That is, suppose the objective function of a type i government in power in period t is

$$(D8)\chi U^i(c_t, g_t) + (1-\chi)\kappa.$$

When i is out of office, $\kappa \equiv 0$. I assume that χ and κ are the same for both $i = S$ and $i = R$. I prove that the results derived above generalise to the case $0 < \chi < 1$ provided that κ is not "too high" (in a sense specified below). Purely office-motivated politicians ($\chi = 0$) would render the model meaningless as they would do anything to get in office. Since voters only care about policies, they would not get any information from purely "populistic" first-period policies. The case $\chi = 1$ is of course the one considered so far.

I prove the results for the case $U^i(c_t, g_t) = \alpha^i \frac{(c_t)^{1-\sigma}}{1-\sigma} + (1-\alpha^t)\frac{(g_t)^{1-\sigma}}{1-\sigma}$. Since $U^i(c_t, g_t) = \alpha^i \ln c_t + (1-\alpha^t)\ln g_t$ is a special case of these preferences, the results holds in that set-up too. I still assume $\delta = \frac{1}{1+r}$ and $r \geq 0$.

It is immediate that, as κ is a constant, optimal policies are not affected. Maximisation of $\chi U^j(c_2, g_2) + (1-\chi)\kappa$ and $\Omega^i(c_1, g_1, b_2; q, \mu, \kappa) = \chi U^i(c_1, g_1) + (1-\chi)\kappa + \delta\{\pi^i(q,\mu) V_2^i(b_2; i) + [1-\pi^i(q,\mu)] V_2^i(b_2; m) + q(1-\chi)\kappa\}$ lead to the same optimal policies as maximisation of $U^j(c_2, g_2)$ and $\Omega^i(c_1, g_1, b_2; q, \mu) = U^i(c_1, g_1) + \delta\{\pi^i(q,\mu) V_2^i(b_2; i) + [1-\pi^i(q,\mu)] V_2^i(b_2; m)\}$. However, for $\chi < 1$, $\kappa > 0$ clearly affects the incentives that l has to mimic k.

The maximum-value function for a given probability of re-election is now $\omega^i(q, \mu, \kappa)$. We have

Result E1

For $\chi < 1$ and $q^{ksep} > \frac{1}{2} > q^{lsep}$, $\exists \overline{\kappa}^l \in (0, \infty)$ s.t. $\Omega^l\left(c_1^{k*}, g_1^{k*}, b_2^{k*}; q^{ksep}, \mu, \overline{\kappa}^l\right) = \omega^l\left(q^{lsep}, \mu, \overline{\kappa}^l\right)$.

Proof:

$$\begin{aligned} & \Omega^l\left(c_1^{k*}, g_1^{k*}, b_2^{k*}; q^{ksep}, \mu, \kappa\right) - \omega^l\left(q^{lsep}, \mu, \kappa\right) \\ = \; & \chi\left\{\left[V_1^l(k) + \delta E^l\left(V_2^l\left(b_2^{k*}\right); q^{ksep}, \mu\right)\right] - \left[V_1^l(l) + \delta E^l\left(V_2^l\left(b_2^{l*}\right); q^{lsep}, \mu\right)\right]\right\} \\ & + \delta\left(q^{ksep} - q^{lsep}\right)(1-\chi)\kappa, \end{aligned}$$

where $V_1^l(i) \equiv U^l(c_1^{i*}, g_1^{i*})$ and $E^l\left(V_2^l(b_2); q, \mu\right) \equiv \pi^l(q,\mu) V_2^l(b_2; l) + \left[1 - \pi^l(q,\mu)\right] V_2^l(b_2; k)$. We already know that this expression is negative for $\kappa = 0$. The derivative of it with respect to κ is

$$(E1)\frac{\partial\left[\Omega^l\left(c_1^{k*}, g_1^{k*}, b_2^{k*}; q^{ksep}, \mu, \kappa\right) - \omega^l\left(q^{lsep}, \mu, \kappa\right)\right]}{\partial\kappa} = \delta\left(q^{ksep} - q^{lsep}\right)(1-\chi).$$

This derivative is strictly positive as long as $\chi < 1$ and $q^{ksep} > \frac{1}{2} > q^{lsep}$. Since $\left[V_1^l(k) + \delta E^l\left(V_2^l\left(b_2^{k*}\right); q^{ksep}, \mu\right)\right] - \left[V_1^l(l) + \delta E^l\left(V_2^l\left(b_2^{l*}\right); q^{lsep}, \mu\right)\right]$ is a finite number, $\exists \overline{\kappa}^l \in (0, \infty)$ such that $\Omega^l\left(c_1^{k*}, g_1^{k*}, b_2^{k*}; q^{ksep}, \mu, \overline{\kappa}^l\right) = \omega^l\left(q^{lsep}, \mu, \overline{\kappa}^l\right)$.

It is immediate from this result that if none of the types has an electoral advantage, mixed motives does not increase the incentives for one type to mimic the other. But if one of the types is favoured by voters, the mimicking incentives of the type which is at a disadvantage in the electoral game are increased. *Result E1* demonstrates that provided that the gain from being in office is not too great, these incentives are not strong enough to destroy the separating equilibrium in which both types play their "first-best" policies.

By simple comparative statics, it can be shown that $\frac{\partial \overline{\kappa}^l}{\partial \chi} > 0$ and $\frac{\partial \overline{\kappa}^l}{\partial q^{ksep}} > 0$.

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Chapter 4

Aspects of the Political Economy of Foreign Aid *

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Abstract

The interaction of external financing with economic reforms in developing countries has been at the forefront of the policy debate for the last 15-20 years. In this paper, a simple model in which an aid donor faces either a reform-minded recipient country government or one defending the status quo is constructed to investigate the impact of aid on political and economic outcomes. The main contributions of this paper are i) to show that while commitment versus discretion is irrelevant to the outcome of the aid game studied here, the recipient government's ability to tax transfers to the private sector is very important; ii) to provide a definition of aid fungibility when both the donor and the recipient act strategically; iii) to point out that very large sums seems to be needed if donors are to have any influence over outcomes; and iv) to demonstrate that the effect of foreign aid on the political equilibrium in democratic recipient countries can be counterproductive from the point of view of the donor.

1 Introduction

In the literature on economic development, the 1980s has been dubbed "the lost decade". It was the decade of the debt crisis, when many developing countries saw their ability to borrow internationally severely restricted, real interest rates rose, and arrears on debt payments mounted. Equally notable

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was the trend in economic policies world-wide. In rich and poor countries alike, reforms aimed at increasing the role of markets and reducing the role of the state were initiated. In the former, problems connected with financing ambitious welfare state programmes in the aftermath of the oil price shocks of the 1970s, which caused a significant increase in unemployment, prompted a reassessment of which tasks the government should carry out. In the latter, the above-mentioned financing problems in many cases forced governments into adjustment mode. However, the economic difficulties were rarely of a purely external nature. Many developing countries had clearly followed unsustainable macroeconomic policies, while at the same time over-extending the role of the state. This was only reluctantly conceded by some of these governments, and others refused to mend their ways even in the face of external financing problems. The resulting economic crises, though, forced even some of the hardliners to turn to the international financial institutions (IFIs) and bilateral donors as substitutes for the private funds that were no longer forthcoming. These actors, however, were generally of the opinion that reforming economic policies was necessary, and this opinion was bolstered as the decade proceeded, resulting in increasingly insistent demands for reforms. Project-based funding was replaced by policy-based funding. The reluctance to reform on the part of governments receiving public bilateral and multilateral funding resulted in a proliferation of conditions attached to both grants and loans. Conditionality became in vogue.

The track record of conditionality in terms of instigating comprehensive and lasting reforms of economic policies is far from impressing. This has lead some observers to advocate the more consensual approach of local "ownership" of reforms, i.e., that reforms should not be forced through by foreigners and should only be supported if the political will to reform is present domestically. All along, critical voices have contended that the reforms advocated by the international community will cause political and social instability in low-income countries and that the result could be that reforms are never fully implemented or are reversed because even pro-reforms government will lack the political power to implement and sustain them. In Hagen (1999), I have investigated the relative influence of political "will" - ideology - and political "power" - support of the electorate - in fostering or preventing economic reforms in democratic low-income countries. Therein, I have also analysed whether lack of access to international credit markets influences the reform choices of governments. Here, I consider how external assistance affects the extent of reforms in a recipient country, a pertinent subject given the ob-

servation of widespread donor "fatigue". I also study the impact of aid on the domestic political equilibrium, a highly relevant topic in the light of the debate about reform ownership.

2 The Model

The population of the recipient country (which is also the electorate) is normalised to 1. The level of (aggregate and average) income is assumed to be fixed at $y > 0$, which is equally divided amongst the inhabitants.

The government taxes private income in order to supply a public consumption good, g, to the population. A unit of public income is assumed to generate a unit of g.[1] The government can be of two types. It either wants a relatively high level of public consumption or a relatively low level of public consumption. The former type of government will be labeled S for status quo, since the status quo in many developing countries before the onset of the reform period of the last 15-20 years was a balance between state and market that was tilted rather heavily in the direction of the former.[2] The other type of government will be called a reform government, denoted by superscript R, as the essence of most of the reforms that have been proposed by the international community has been to tip the scales at a level implying a greater role for the private sector.[3]

A government of type j determines its optimal tax rate by maximising

$$(1) U^j(c,g) = \beta^j \ln c + \left(1-\beta^j\right) \ln g,$$

[1] Thus, taxation is assumed to be non-distortionary. This is unrealistic, of course, but for our purposes, nothing is lost by abstracting from the well-known efficiency losses of taxation.

[2] This statement must be interpreted in relation to the level of economic development in these countries. Rich countries have much larger public sectors than poor countries, but are better equipped to finance them, c.f. the fiscal crises that have been a persistent feature in many developing countries over the last few decades. The size of the public sector in the current low-income countries is also greater on average than the size of the public sectors of the current high-income countries when these were at a similar stage of economic development.

[3] For example, Killick (1998) notes with respect to the IMF that "the Fund's move into 'structural' conditionality has had three thrusts: 1. to increase the role of markets and private enterprises relative to the public sector, and to improve incentive structures; 2. to improve the efficiency of the public sector; and 3. to mobilize additional domestic resources." (p.1)

where c (g) is private (public) consumption. As should be clear from the above, I assume that $1 > \beta^R > \beta^S > 0$.

In the absence of aid, the total income of the economy is y. The private and public budget constraints are therefore simply

$$\begin{aligned} (2a)\,(1-\tau)\,y &= c; \\ (2b)\tau y &= g. \end{aligned}$$

τ is the tax rate, and it is easily demonstrated that the optimal level from the perspective of a type j government is

$$(3)\tau^*(j) = 1 - \beta^j.$$

The result is that private and public consumption becomes

$$\begin{aligned} (4a)c^*(j) &= \left(1-\tau^{j*}\right)y = \beta^j y; \\ (4b)g^*(j) &= \tau^{j*} y = \left(1-\beta^j\right)y. \end{aligned}$$

We see that $c^{S*} < c^{R*}$ and $g^{S*} > g^{R*}$. That is, there is greater private and less public consumption under a status quo government, as should be expected.

These outcomes and the underlying optimal tax rate constitute the "fall-back" position of the economy should the government and the donors fail to come to agreement on the terms of the aid. If an agreement can be reached, it follows from (4a) and (4b) that a government of type j aims for the outcome $c^*(j) = \beta^j(y+A)$ and $g^*(j) = \left(1-\beta^j\right)(y+A)$, where A is the total amount of aid available.

The donor has the same kind of objective function as possible recipient country governments. It is assumed to be even more reform-minded than a type R government. This seems the natural assumption to make, given the conditionality debacle that has characterised North-South relations since the onset of the debt crisis. Specifically, I assume $\beta^D > \beta^R$.[4]

[4]The case $\beta^D = \beta^R$ is not of great interest, for obvious reasons. The case $\beta^R > \beta^D > \beta^S$, which could have interesting implications for domestic politics in the recipient country, is left for future research. If, for some reason, $\beta^D < \beta^S$, the outcomes would be mirror-images of the ones presented below.

The donor has a fixed budget of size A (measured in the same currency as recipient country variables). The "unconstrained" optimum of the donor is thus at $c^*(D) = \beta^D(y+A)$ and $g^*(D) = (1-\beta^D)(y+A)$, since the total income of the economy with aid is $y+A$. However, the giving of aid is not unconstrained. First of all, a donor cannot tax a recipient in any way. Secondly, a recipient country government can refuse to accept foreign assistance if it is made worse off by it. Because the donor and the recipient governments do not concur in the optimal distribution of resources, it is conceivable that the donor's offer would entail such a "bad" distribution of resources from the perspective of the recipient government that the extra income does not compensate for it.

I will assume that the donor can split its budget between aid given to the private sector, a_c, and aid given to the government, a_g.[5] These must thus both be non-negative, and the sum cannot exceed the donor's total budget. While most bilateral aid is state-to-state, some is given directly to the private sector, partly through private humanitarian organisations. In any case, it is interesting to see if these two types of aid makes any difference, particularly in the face of the widespread notion that aid is *fungible*. If aid is completely fungible, this implies that in whichever way it is given and irrespective of any conditions attached to it, it ends up as "free funds" for the government, which therefore can use it for whatever purpose it wants. If aid is not completely fungible, then some of it must be spent on the purpose(s) envisaged by the donor.[6]

As we shall see, the view that aid is fungible is in general not correct, and if the donor's budget is large enough, fungibility is zero. However, for practical purposes, it seems to be the case that aid is fungible to some extent. For "intermediate" levels of the donor's budget, aid is partially fungible. Aid is perfectly fungible only if either a) the government can tax any aid given to the private sector or b) it cannot tax a_c, but the donor's total

[5] Aid given to the private sector can either be direct transfers or come in the form of investments that generate income for individuals in that sector. Since domestic income is exogenous in the current set-up, it is modelled in the first way here.

[6] The concept is used in several different ways in the literature. The definition here is essentially that of Pedersen (1997), who states that aid is fungible if it is possible for the recipient to divert resources away from the activity the donor seeks to finance. As pointed out by him, the possibility of diversion is but a necessary condition for actual diversion; in order to divert, the recipient must also wish to do so. I discuss fungibility in relation to the model used here in more depth below.

budget is "small". Thus, the details of the tax system, or the government's administrative capacity in a wider sense, might make a great difference with respect to the effects of aid on the final allocation of resources in the economy. We shall consider the two extreme cases in which a) the government can tax a_c in the same way as it taxes domestic incomes and b) it cannot tax a_c at all.

In a game-theoretic perspective, the order in which the donor and the recipient make their moves must be expected to be important. In economic policy games, it is in general an advantage to move first. By committing one's policy, taking into account the consequences of one's choices on the optimal response of the opponent, one can influence the outcome of the game in favour of oneself. We shall therefore investigate both the case where the donor moves last and the case where it moves first.[7] In game-theoretic parlance, we shall see what happens both when the donor is a Stackelberg-follower and when it is a Stackelberg-leader. The former case will be examined first, as it is the most realistic one. It is hard to think of mechanisms by which a bilateral donor can "tie its own hands" unilaterally. Still, it is interesting to see how the equilibrium strategies and the outcome in this case differs from the more realistic one considered next.

3 The Donor as a Follower

3.1 Aid to the Private Sector Is Taxable

The timing is now as follows. First, the recipient country government chooses its tax policy. Then the donor chooses its aid policy taking the tax rate as given and disburses the optimal sums. Finally, taxes are collected and c and g are consumed. To distinguish optimal actions and outcomes from those resulting from reversing the order in which the donor and the recipient move, I use the superscript F.

[7]The former case has been analysed in a donor-recipient context by Pedersen (1995), Svensson (1995) and Bruun (1998). Pedersen (1995) has also analysed the latter. Bruun (1998) studies an altruistic donor which is to divide its budget between two recipient countries in which the governments only care about aggregate consumption. Svensson (1995) also analyses competition for aid between recipient countries, but assumes that the donor only cares about the consumption of the poor, a feature he shares with Pedersen (1995).

When that tax rate is applied to both private domestic income and aid given to the private sector, it is easy to show that aid is perfectly fungible. If the recipient country government sets the tax rate[8]

$$(5)\widehat{\tau}^F(j) = 1 - \beta^j\left(\frac{y+A}{y+a_c}\right),$$

the outcome will clearly be

$$\begin{aligned}(6a)\widehat{c}^F &= \beta^j(y+A) \equiv c^*(j);\\ (6b)\widehat{g}^F &= \left(1-\beta^j\right)(y+A) \equiv g^*(j).\end{aligned}$$

That is, the government achieves its "first-best" combination of private and public consumption given a total income level of $(y+A)$.

This is so because the donor will be facing the budget constraints $c = \left(1-\widehat{\tau}^F(j)\right)(y+a_c)$ and $g = \widehat{\tau}^F(j)(y+a_c) + a_g$. In whichever way the donor divides A into a_c and a_g, $c = \beta^j\left(\frac{y+A}{y+a_c}\right)(y+a_c) = \beta^j(y+A)$ and $g = (y+a_c) - \beta^j\left(\frac{y+A}{y+a_c}\right)(y+a_c) + a_g = (y+a_c) - \beta^j(y+A) + A - a_c = \left(1-\beta^j\right)(y+A)$. Therefore, the donor's actions cannot be uniquely pinned down; any $\{a_c, a_g\} = \{a_c, A-a_c\}$, $a_c \in [0, A]$, is a best response to (5). The optimal strategy of the government is unique given its type, however, and the outcome is described by (6) regardless of what the donor's actual response is.

Note that the donor influences policies with aid. $\widehat{\tau}^F(j) \leq 1-\beta^j$ since $a_c \leq A$. But even if the tax rate is lowered compared to the situation without foreign assistance, the outcome - the share of total resources going to c and g - is fully determined by the government. Moreover, the change in policy is just the optimal response of the government to the fact that aid is fungible.

3.2 Aid to the Private Sector Is Not Taxable

The case where the government cannot tax aid given to the private sector is more complicated, and thus, in its own way, more interesting. It is perhaps unrealistic to assume that a_c cannot be taxed at all. And there is clearly

[8]Here and in the next section, I use a hat to denote actions and outcomes when aid to the private sector is taxable.

no reason within the confines of the model why this should be so. However, tax systems in many developing countries are highly rudimentary and tax administration is notoriously lax, with corruption, tax avoidance, and tax evasion constituting very real constraints on the government's ability to raise revenues. While this presumably applies equally well to income from both domestic and foreign sources, our focus is on the consequences of aid, so here we assume that τ applies to y but not to a_c, while admitting that the intermediate case of both being imperfectly taxable is the most realistic.[9]

On the face of it, the donor faces a quite complex optimisation problem once the government has determined the tax rate. The donor must choose its aid policy respecting its own budget constraint, the non-negativity constraints on a_c and a_g, as well as the constraint that the utility of the government must be as high with aid as without aid in order to induce it to accept the offer. However, it turns out that in the sub-game perfect equilibrium of the aid game, the government will always be strictly better off accepting aid (see the appendix). Hence, this constraint will not be binding along the equilibrium path, which we shall focus on here.

Ignoring the constraint on the government's utility, the Lagrange function the donor will be maximising for each given τ and A is $\Lambda^D = U^D(c,g) + \lambda(A - a_c - a_g)$. The first-order conditions are

$$\begin{aligned}
(7a)\frac{\partial \Lambda^D}{\partial \lambda} &= A - a_c - a_g \geq 0; \lambda \geq 0; \lambda \frac{\partial \Lambda^D}{\partial \lambda} = 0; \\
(7b)\frac{\partial \Lambda^D}{\partial a_c} &= \frac{\beta^D}{c^F} - \lambda \leq 0; a_c \geq 0; a_c \frac{\partial \Lambda^D}{\partial a_c} = 0; \\
(7c)\frac{\partial \Lambda^D}{\partial a_g} &= \frac{1-\beta^D}{g^F} - \lambda \leq 0; a_g \geq 0; a_g \frac{\partial \Lambda^D}{\partial a_g} = 0.
\end{aligned}$$

The conflict between the donor and the government is over the relative shares of c and g in total income $y + A$. If the government allowed the donor "a free hand", $(A7a - c)$ would have an interior solution and the outcome would be $c = \beta^D(y + A) = c^*(D)$ and $g = (1 - \beta^D)(y + A) = g^*(D)$.

[9]It can be shown that all the results generalise to the intermediate case when $\gamma > \beta^D$ and $\eta < \beta^S$, where γ (η) is the fraction of a_c (y) which is *not* taxable. Moreover, the results hold if the government uses lump-sum taxation and in a purely budgetary model (i.e., where the government, like the donor, has a given budget to allocate to the two goods).

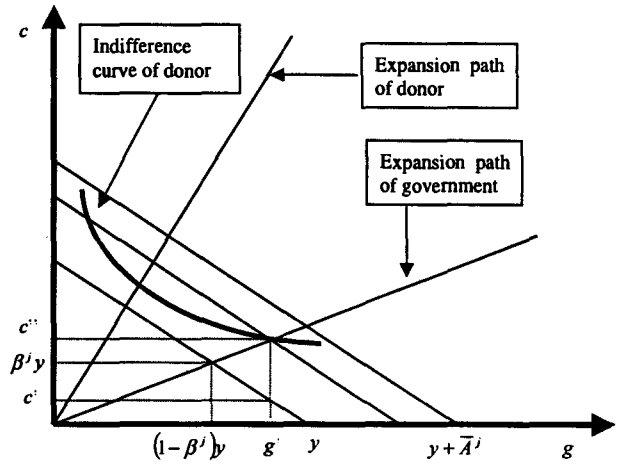

Figure 1: exploiting the non-negativity constraints on aid

The donor wants more private consumption and less public consumption than the government, so the task facing the government is to set the tax rate so that the donor cannot reduce public consumption without violating the non-negativity constraint on a_g. For some levels of the aid budget, the government can in fact attain its "first-best" allocation by choosing $\tau^F(j) = \frac{1}{y}\left(1-\beta^j\right)(A+y)$.[10] This ploy works until the donor's budget is so large that the government hits a constraint of its own, namely, $\tau \leq 1$ (see figure 1).[11] From $\tau^F(j) = \frac{1}{y}\left(1-\beta^j\right)(A+y)$, it is easily calculated that the critical level of the donor's budget is $\overline{A}^j = \left(\frac{\beta^j}{1-\beta^j}\right) y$.

Thereafter, the government can secure a minimum level of public consumption, $g = y$, by keeping $\tau = 1$. The donor will still be spending all of its budget on a_c, so any increase in the donor's budget will end up as private consumption until the donor's budget is so large that it optimally spends at least

[10]For notational simplicity, we denote this specific value of $\tau^F(j)$ by $\tau^*(j)$, in analogy with (3), since it is the tax rate that the government would have chosen if private domestic income was $y + A$, but A was not taxable.

[11]>From Figure 1, it can be seen that the constraint on the government's utility will not be binding along the equilibrium path. By choosing $\{c', g'\}$ (by way of the tax rate), the government is worse off without aid compared to $\left\{\beta^j y, \left(1-\beta^j\right) y\right\}$. But since choosing $\{c', g'\}$ makes $\{c'', g'\} = \left\{\beta^j(y+A), \left(1-\beta^j\right)(y+A)\right\}$ the donor's optimal choice (by way of its optimal aid policy), the government is better off in equilibrium.

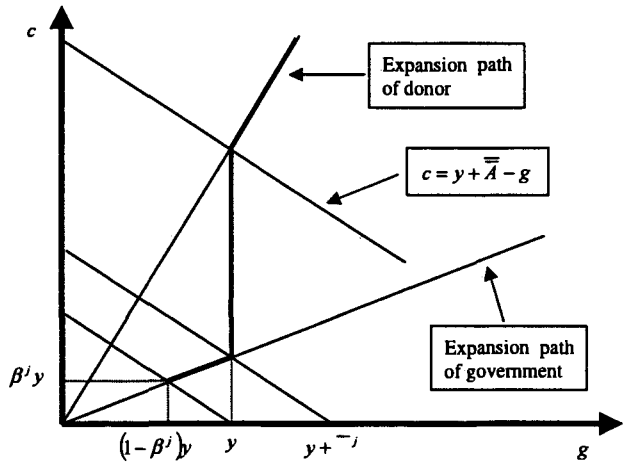

Figure 2: outcomes when donor moves after government

y on public consumption (that is, until A is so high that $\left(1-\beta^D\right)(y+A) = y$). From then on, the donor will have complete control, in the sense that the outcome is as good as it gets for it: $c^F = \beta^D(y+A) = c^*(D)$ and $g^F = \left(1-\beta^D\right)(y+A) = g^*(D)$. This outcome is generated by the "first-best" aid policy $\left\{\beta^D(A+y) - (1-\tau)y, \left(1-\beta^D\right)(A+y) - \tau y\right\} \equiv \left\{a_c^*, a_g^*\right\}$. Figure 2 illustrates the outcome (the bold line segments) as a function of A.

As we have seen, the critical level of the aid budget at which the donor starts to have some influence is $\overline{A}^j = \left(\frac{\beta^j}{1-\beta^j}\right)y$, which is a function the preferences of the government. Since $\beta^R > \beta^S$, $\overline{A}^R > \overline{A}^S$. That is, when a status quo government is in power the donor starts to have influence at lower budget levels than when a reform government is in power. This is due to the fact that the status quo government ideally wants a higher level of public consumption than a reform government. It therefore hits the constraint $\tau \leq 1$ before a reform government does.

The donor has complete control when its budget exceeds $\overline{\overline{A}} = \left(\frac{\beta^D}{1-\beta^D}\right)y$. Depending on its the preferences, this might entail unrealistically large budgets, sizeable budgets for development assistance to the country in question, or small sums. We shall discuss this matter latter. For now, it suffices to point out that since $\beta^D > \beta^R$, $\overline{\overline{A}} > \overline{A}^R$, which confirms that the donor must

have more resources in order to achieve complete control than it must have to have some influence.

Note that in this case, when determined by the equilibrium concept, $\tau^F(j) \geq 1 - \beta^j$ with a strict inequality for all positive levels of aid. That is, the donor influences policies, as is the case when a_c is taxable, but in a direction which is the exact opposite of what it would have liked to see. This holds for both types of governments, which optimally tax harder when aid is given than when it is not. Of course, at the end of the day, it is the outcome that matters, not the policy, but in light of the debate on conditionality vs. ownership, it is interesting to see that even a reform government would optimally act contrary to the donor's wishes.

Summing up, the optimal actions of the donor along the equilibrium path are

$$(8)\left\{a_c^F, a_g^F\right\} = \begin{cases} \{0,0\}, A = 0; \\ \{A,0\}, A \in \left(0, \overline{\overline{A}}\right]; \\ \left\{a_c^*, a_g^*\right\}, A > \overline{\overline{A}}. \end{cases}$$

The best response of the government is (along the equilibrium path)[12]

$$(9)\tau^F(j) = \begin{cases} \tau^*(j), A \in \left[0, \overline{A}^j\right]; \\ 1, A \in \left(\overline{A}^j, \overline{\overline{A}}\right]; \\ \text{any } \tau \in [0,1], A > \overline{\overline{A}}. \end{cases}$$

Finally, the outcome as a function of the donor's budget and the government's type is in equilibrium

$$(10)\left\{c^F, g^F\right\} = \begin{cases} \{c^*(j), g^*(j)\}, A \in \left[0, \overline{A}^j\right]; \\ \{A, y\}, A \in \left(\overline{A}^j, \overline{\overline{A}}\right]; \\ \{c^*(D), g^*(D)\}, A > \overline{\overline{A}}. \end{cases}$$

3.3 The Issue of Fungibility

It is difficult to define fungibility in a precise way. In the literature, the example that is ordinarily used to illustrate the concept is a situation where

[12]The assumption that $\tau \geq 0$ is innocuous. The alternative specification for $A > \overline{\overline{A}}$ - any $\tau \leq 1$ - does not change the outcome.

a donor wants to support a specific activity in the recipient country through an earmarked grant. Aid is then said to be fungible if expenditures on that activity do not rise by the full amount of the grant. But this is a naive representation of the donor, particularly if fungibility is indeed an important problem.[13] In the present model, the donor acts strategically, taking into account the possibility of diversion of resources by the recipient.[14] Therefore, it optimally adjusts its aid policy in order to achieve as much as possible. It follows that in the current context, fungibility is better defined in terms of influence over the final allocation. That is, aid is perfectly fungible if the donor has no influence on the outcome, partially fungible if it has some, and not fungible if the donor is in complete control over the outcome.

An alternative view would be that foreign development assistance is not fungible at all when the government cannot tax a_c. For $A \leq \overline{A}^j$, the donor allocates its total budget to private consumption. While the government controls the final allocation, $c = (1-\tau)\, y + A \geq A$ in this range (since $\tau \leq 1$). For $A > \overline{A}^j$, the donor has some limited influence on the final allocation. It still chooses $a_c = A$, and since $c = A$, no part of the donation is spent on g. Finally, when the donor is in complete control, aid is clearly not fungible. But this position will not do; the donor acts in this way precisely because it realises that aid is fungible (partially or completely) for $A \leq \overline{\overline{A}}$.

Hence, I suggest that in aid games, fungibility should be defined in terms of the extent of the influence that the donor has over the final allocation. A simple though arbitrary measure of donor influence in the current model is

$$(11)\Delta\left(\left\{c^F, g^F\right\}\right) = \frac{d\left(\left\{c^F, g^F\right\}, \left\{c^*(j), g^*(j)\right\}\right)}{d\left(\left\{c^*(D), g^*(D)\right\}, \left\{c^*(j), g^*(j)\right\}\right)},$$

where $d(v, w)$ is the Euclidean distance between the points v and w.

[13] See e.g. Feyzioglu, Swaroop, and Zhu (1998). Even in this apparantly simple setting, however, there are some loose ends. These authors for some reason assume that the recipient must spend at least the size of the grant on the activity supported by the donor. Presumably this is because the donor will "punish" the recipient if it spends less than this amount. But then why does not the donor punish the recipient if it diverts part of the grant to other activities? Given the problem of punishing straying recipients, there is an untold story here that needs elaboration.

[14] That there is no crowding-out of domestic spending here even when aid is perfectly fungible (c.f. $c = \beta^j (y + A)$, while in the absence of aid, $c = \beta^j y$; i.e., domestic spending is constant at $\beta^j y$) is an artifact of the particular form chosen for the utility functions, which yields linear expansion paths.

Thus, $\Delta\left(\left\{c^F, g^F\right\}\right)$ measures the distance between the outcome and the government's "first-best" allocation as a proportion of the distance between the "first-best" allocations of the donor and the government. The measure therefore requires $\{c^*(D), g^*(D)\} \neq \{c^*(j), g^*(j)\}$, but, as noted by Devarajan, Rajkumar, and Swaroop (1999), "[T]he question of what aid ultimately finances is interesting only if the preferences of the donor are different from those of the recipient".

It is easily seen that $\Delta(\{c^*(j), g^*(j)\}) = 0$ and $\Delta(\{c^*(D), g^*(D)\}) = 1$. This confirms that the donor has no influence for $A < \overline{A}^j$, and is in complete control once $A > \overline{\overline{A}}$. It is straigthforward to verify that $\Delta\left(\left\{c^F, g^F\right\}\right)$ is an increasing function of A on $\left[\overline{A}^j, \overline{\overline{A}}\right]$, with $\Delta\left(\left\{c^F, g^F\right\}\right) = 0$ at $\overline{A}^j$ and $\Delta\left(\left\{c^F, g^F\right\}\right) = 1$ at $\overline{\overline{A}}$. Thus, the donor has some influence when $A \in \left(\overline{A}^j, \overline{\overline{A}}\right)$, and its influence over the final allocation increases with its budget until it is in complete control, as previously shown.

4 The Donor as the Leader

I now change the order in which the donor and the recipient make their moves. Thus, I assume that the donor moves before the recipient. It should be clear that if a_c is taxable in the same way as y, development assistance is for all practical purposes still completely fungible.[15] The budget constraints facing the government after the donor has chosen its aid policy are $c = (1-\tau)(y + a_c)$ and $g = \tau(y + a_c) + a_g$. There is no way the donor can manipulate these through a_c and a_g to prevent the government from achieving its optimal distribution of $y + A$ into c and g by way of τ that would improve the outcome from its point of view.[16] We shall therefore concentrate on

[15] An analogous result has been derived by Pedersen (1995) for the case he labels "the donor as a passive Stackelberg leader". His "active Stackelberg leader" is assumed to be able to write binding contracts with the government in a recipient country. It can thus keep the government at its "participation constraint", i.e., the level of "utility" it will have in the absence of aid. However, in practice, such contracts are not legally enforceable. There are no international courts in which redress for breach of contract can be sought. Therefore, the approach chosen here, which assumes that no legal means are available to alter the outcome relative to the subgame-perfect equilibrium, seems more realistic.

[16] The qualification relates to the possibility that we must have $\tau \geq 0$, i.e., subsidiation is not allowed. The donor could set $a_g = A$. Then $g \geq A$ if $\tau \geq 0$. If $A \geq \left(1 - \beta^D\right)(y + A)$,

the case where a_c cannot be taxed. Whenever it is necessary, I will use the superscript L to distinguish strategies and outcomes from those derived in the last section.

It is straightforward to calculate that at an interior solution, the government would choose the following tax rate as a function of a_c and a_g:

$$(12)\tau^L(j) = \frac{1}{y}\left[\left(1-\beta^j\right)(y+a_c) - \beta^j a_g\right].$$

Now the donor must try to exploit the constraint $\tau \leq 1$. This it can do if its budget is large enough. $\tau^L(j) \leq 1 \Leftrightarrow a_c \leq \left(\frac{\beta^j}{1-\beta^j}\right)(y+a_g)$, so even utilising its resources maximally (setting $a_c = A$ and $a_g = 0$), the donor will not be able to influence the outcome until $A > \left(\frac{\beta^j}{1-\beta^j}\right) y = \overline{A}^j$. For budgets lower than this, aid is completely fungible, and the government achieves its "first-best" outcome. For $A \geq \overline{A}^j$, the donor finances private consumption and the government finances public consumption until the maximum level of public consumption that the government can secure (y) is the optimal one from the donor's perspective. This occurs at a level of the aid budget equal to $\overline{\overline{A}} = \left(\frac{\beta^D}{1-\beta^D}\right) y$. Thus, the degree of fungibility exhibits the same pattern as in the situation where the donor moved last.

In sum, the optimal actions of the government along the equilibrium path are

$$(13)\tau^L(j) = \begin{cases} \tau^*(j), A = 0; \\ \frac{1}{y}\left[\left(1-\beta^j\right)(y+a_c) - \beta^j a_g\right], A \in \left(0, \overline{A}^j\right]; \\ 1, A > \overline{A}^j. \end{cases}$$

The donor's best response is (along the equilibrium path)

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the government ideally wants a lower level of g, but is constrained by the impossibility of setting a negative tax rate. a_c cannot be used in the same way, since any fraction of it can be turned into g through τ. Of course, the donor does not want to force the government into this corner, because the outcome would be even more g than at the government's "first-best" allocation, which still has more g than the donor wants. The donor is powerless to influence the outcome in the dersired direction in this case as well, so according to the definition used here, aid is completely fungible.

$$(14)\ \left\{a_c^L, a_g^L\right\} = \begin{cases} \{0,0\}, A = 0; \\ \{a_c, A - a_c\}, A \in \left(0, \overline{A}^j\right]; \\ \{A, 0\}, A \in \left(\overline{A}^j, \overline{\overline{A}}\right]; \\ \left\{a_c^*, a_g^*\right\}, A > \overline{\overline{A}}. \end{cases}$$

The equilibrium outcome produced is the same as when the donor is a follower

$$(15)\ \left\{c^L, g^L\right\} = \begin{cases} \{c^*(j), g^*(j)\}, A \in \left[0, \overline{A}^j\right]; \\ \{A, y\}, A \in \left(\overline{A}^j, \overline{\overline{A}}\right]; \\ \{c^*(D), g^*(D)\}, A > \overline{\overline{A}}. \end{cases}$$

We see that both $\overline{A}^j$ and $\overline{\overline{A}}$ are unchanged from the case where the donor moved last. This is perhaps surprising prima facie, but it turns out that the two cases are mirror-images of each other. When the donor moves last, the government is able to exploit the non-negativity constraint on a_g until it cannot increase the level of public consumption in the absence of aid, that is, until $\tau = 1$. Hence, the government corners the donor by making $a_c = A$ its optimal choice. From then on, even by setting $\tau = 1$, the government is powerless to stop the donor from turning any increase in its budget into more c. Here, the donor is not able to prevent an interior solution to the government's optimisation problem if its budget is small. But once its total budget is large enough for the extreme aid policy $a_c = A$ to make an impact, it will exploit the government's incomplete ability to tax total private sector income. $a_c = A$ will make an impact when the government ideally wants a level of c which is lower than this (given total income $y + A$). Thus, the government gets pinned down at $\tau = 1$ by the donor.

The conflict between donor and recipient is over how to split the pie. Lacking the powers to tax, the donor must exploit any weaknesses on the part of the government. The government's weakness is that it has incomplete control over private sector income. The donor can use this to its advantage when it has enough resources to make c inoptimally high from the perspective of the government even when all domestic income is taxed away. However, it is not in complete control until it wants to increase g from the level at which the government has fixed it. Conversely, the government takes advantage

of the donor's inability to tax when it moves first. This works as long as it can secure more g through its own resources than is optimal from the donor's point of view. For low levels of A, it can attain its "first-best" allocation through this strategy. For medium levels of the donor's budget, the government can secure a minimum level of g by spending all domestic income on this good. It becomes powerless to affect the outcome once the donor wants $g \geq y$. So the underlying logic of the conflict is that, if possible, both the donor and the recipient exploit the incomplete control of the other party over the pie to increase the share allocated to the good it prefers the most relatively speaking. Since their preferences are thus in effect strictly opposed, each of them are drawn to the extreme positions that the other party uses against them when it has a first-mover advantage.

5 Domestic Political Equilibrium and Aid

Let us now assume that the government is chosen through democratic elections. That is, before the aid game starts, there is an election in which voters voter for either R or S. This choice is determined by comparing the outcomes with the two governments in power, given the level of the donor's aid budget:[17]

Table 1: outcomes under different types of government

A/j	R	S
$\left[0, \overline{A}^S\right]$	$\{c^*(R), g^*(R)\}$	$\{c^*(S), g^*(S)\}$
$\left(\overline{A}^S, \overline{A}^R\right]$	$\{c^*(R), g^*(R)\}$	$\{A, y\}$
$\left(\overline{A}^R, \overline{\overline{A}}\right]$	$\{A, y\}$	$\{A, y\}$
$> \overline{\overline{A}}$	$\{c^*(D), g^*(D)\}$	$\{c^*(D), g^*(D)\}$

Since the outcomes do not depend on the order in which the donor and the government moves, the following applies to both cases analysed above.

Voters have utility functions which are analogous to the objective functions of the government and the donor. We can, for each of the four categories of aid levels in the table, find the preferences of the voter who is indifferent between the two types of government. It is immediate from Table 1 that for

[17] Because aid is completely fungible when the government can tax whatever amount is given to the private sector, the outcome only depends on the government's type. Hence, I ignore these cases here.

$A > \overline{A}^R$, *all* voters are indifferent between R and S because the outcome is the same regardless of the choice of government. This is so even if the election would produce a clear-cut winner in the absence of foreign aid. With no aid forthcoming, the indifferent voter(s) I has a weight on the utility of private consumption equal to[18]

$$(16)\beta^I = \frac{\ln\left(1-\beta^S\right) - \ln\left(1-\beta^R\right)}{\left[\ln\beta^R - \ln\beta^S\right] + \left[\ln\left(1-\beta^S\right) - \ln\left(1-\beta^R\right)\right]}.$$

It can be shown that $\beta^I \in \left(\beta^S, \beta^R\right)$. If the preferences of the median voter are such that $\beta^M < \beta^I$, S wins the election.[19] On the other hand, for $\beta^M > \beta^I$, R wins the election. Only in the unlikely case $\beta^M = \beta^I$ would the outcome of the election be indeterminate in the absence of aid. If the median voter resolves his indifference by flipping a fair coin, a donor might contribute to turning a certain victory for a reform government into a mere 50-50 chance of winning! The giving of aid, however, can even turn the domestic political equilibrium upside down when $A \in \left[\overline{A}^S, \overline{A}^R\right]$.

To see this, we must find the indifferent voter for those levels of the aid budget. When $A = \overline{A}^S$, β^I is still given by (16), since in this borderline case, S achieves its optimal allocation at a tax rate of unity. For $A > \overline{A}^S$, the calculation is complicated by the fact that it is no longer only the ideology of the two alternatives that matter. S is now at a corner solution, and the level of aid therefore plays a role. The problem is best solved by defining a "virtual" opponent to R, that is, a government with preferences such that the outcomes produced under an S-government equal its "first-best" outcomes. β^I can then be calculated in analogy with (16).

The weight the "virtual" opponent attaches to the utility of private consumption, $\widetilde{\beta}$, must satisfy $\widetilde{\beta}(y + A) = A$, or

$$(17)\widetilde{\beta}(A) = \frac{A}{y + A}.$$

[18] β^I is found by calculating the β for which the utility from electing R is equal to the utility from electing S. See Appendix A of Hagen (1999) for the details.

[19] The conditions ensuring that the median voter is decisive are clearly satisfied here (in particular, preferences are single-peaked) even though he cannot choose his most preferred tax rate. The median voter model is unrealistic for national elections, three notable features of which are a fixed set of alternatives (parties or candidates with party labels), uncertainty about voter preferences, and voter uncertainty about what policy will result from the election of a particular alternative. Only the first is present here, but there is no point in introducing the last two features in the current model, which has only one period.

Clearly, $\widetilde{\beta}(A) \in (0,1)$ as required (since $A \geq \overline{A}^S > 0$). Moreover, $\frac{\partial \widetilde{\beta}(A)}{\partial A} > 0$. The more aid is given in this range, the higher is private consumption (public consumption is constant). Thus, to make the outcome a "first-best" outcome for the "virtual" opponent when foreign assistance goes up, it must attach a greater weight to private consumption. Furthermore, as $\widetilde{\beta}\left(\overline{A}^S\right) = \beta^S$, $\widetilde{\beta}\left(\overline{A}^R\right) = \beta^R$, and $\beta^R > \beta^S$, $\widetilde{\beta}(A) \in [\beta^S, \beta^R]$.

β^I is now a function of the aid budget:

$$(18)\beta^I(A) = \frac{\ln\left(1-\widetilde{\beta}(A)\right) - \ln\left(1-\beta^R\right)}{\left[\ln\beta^R - \ln\widetilde{\beta}(A)\right] + \left[\ln\left(1-\widetilde{\beta}(A)\right) - \ln\left(1-\beta^R\right)\right]}.$$

In the appendix, it is demonstrated that $\frac{\partial \beta^I(A)}{\partial A} > 0$, with $\lim_{A \to \overline{A}^R} \beta^I(A) = \beta^R$. That is, the identity of the indifferent voter is moved "to the right" as the aid budget goes up, and in the limit (in this range of aid budgets), even a voter with a weight on the utility of private consumption equal to β^R is indifferent between the two types of government! The latter is due to the fact that in the borderline case of $A = \overline{A}^R$, the outcome is $\{A, y\}$ regardless of which government is in power.

What is happening is that as the aid budget increases, the outcomes under the two types of governments are converging, c.f. Figure 3. In the end, the outcomes are the same, and the label of the government does not matter for outcome-oriented voters. The country is effectively under foreign administration, and domestic politics therefore is devoid of any real content.

If $\beta^M \in \left(\beta^I\left(\overline{A}^S\right), \beta^I\left(\overline{A}^R\right)\right)$, a reform government would have won in the absence of aid. $\beta^I\left(\overline{A}^S\right)$ is equal to β^I as given by (16), which in turn lies between β^S and β^R. Therefore, if $\beta^M > \beta^I\left(\overline{A}^S\right)$, a reform government would have been preferred to a status quo government by a majority of the voters if no aid was forthcoming. But with aid, there clearly exists an aid budget $A' \in \left(\overline{A}^S, \overline{A}^R\right)$ such that $\beta^M = \beta^I(A')$ (since $\beta^I\left(\overline{A}^R\right) = \beta^R$, $\beta^M < \beta^R$, and $\frac{\partial \beta^I(A)}{\partial A} > 0$). Hence, for $A \in \left(A', \overline{A}^R\right)$, a reform government will now certainly lose the election!

Such an outcome would clearly make the donor worse off. Even though it has some influence with a status quo government compared to none with

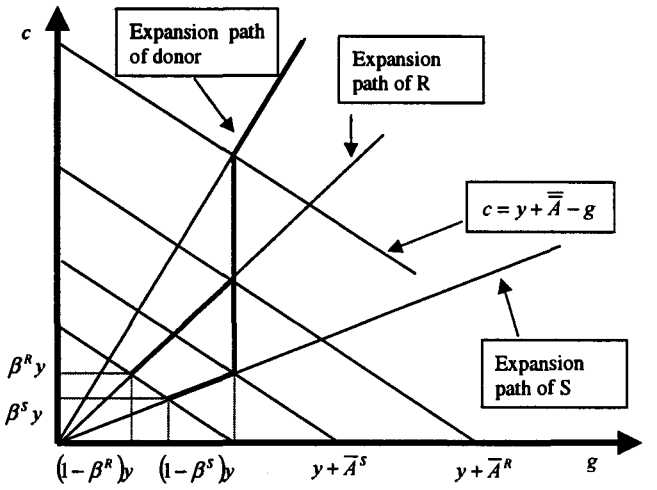

Figure 3: convergence of outcomes under R- and S-Governments

a reform government, outcomes are still better under the latter from the donor's point of view. In Figure 3, it is easily seen that for any aid budget in the region $\left[\overline{A}^S, \overline{A}^R\right)$, the point on R's expansion path, which will be the outcome if it is in power, is closer to the corresponding point on the donor's expansion path than $\{A, y\}$ is.

While this need not happen, it is clear that if aid decisively affects the domestic political equilibrium, it is in this direction. If $\beta^M < \beta^I\left(\overline{A}^S\right)$, a reform government loses the election $\forall A < \overline{A}^R$. From $\overline{A}^R$ on, it has a 50% chance of winning. If $\beta^M > \beta^I\left(\overline{A}^R\right)$, a reform government wins the election until $A = \overline{A}^R$. For higher levels of the aid budget, its probability of winning drops from 1 to 0,5. Finally, as just noted, if $\beta^M \in \left(\beta^I\left(\overline{A}^S\right), \beta^I\left(\overline{A}^R\right)\right)$, R wins as long as $A < A'$, see its chances of winning reduced to 0,5 at A', and vanish for $A \in \left(A', \overline{A}^R\right)$. From then on, its electoral standing recovers to a 50% chance of winning.

6 How Realistic Is Donor Influence?

We have seen that whether the donor has no, limited, or complete control over the outcome of the aid game depends on the size of its total budget relative to two critical values, $\overline{A}^j$ and $\overline{\overline{A}}$. Both are functions of the preferences of one of the players, specifically, the government and the donor, respectively. Looking at the latter first, $\overline{\overline{A}} = \left(\frac{\beta^D}{1-\beta^D}\right) y$, the value of which is increasing in β^D. For small enough values of β^D, the resource requirement for complete control does not look daunting. If $\beta^D = 0,2$, for example, $\overline{\overline{A}} = 0,25y$. However, the size of the budget is only small for what is presumably unrealistic specifications of the donor's preferences. It seems reasonable to suggest that the pressures put on recipient countries in the last couple of decades are for state sectors well below 50% of the economy. Thus, $\beta^D > \frac{1}{2}$ is realistic, implying that the donor must have a budget greater than the pre-aid level of income of the country in question. According to the World Development Report 1997, for example, Mozambique received aid equivalent to 101% of its GNP in 1994, and the corresponding number for Rwanda was 95,9%.[20] However, these are clear outliers in the sample, and there is no reason to believe that the picture is very different in other years. Moreover, these numbers are for total aid given to the country, so single donors (whether bilateral or multilateral) would clearly see the requirement for complete influence exceed their resources. If we interpret the donor as the international community, it is thus possible to come up with country examples where the sums are so great that development assistance might be expected to determine recipient country resource allocation according to the current model. Though, these are exceptional, and as we are about to see, the expectation is probably still not realistic.

What then of the critical level of aid needed to have some influence? Numbers for the size of the public sector in developing countries are hard to come by. A recent study by Commander, Davoodi, and Lee (1997) provides data for public consumption as a share of GDP that can be used for

[20] If aid influences the level of income, these are not the kind of numbers we really want. Many empirical studies have investigated the relationship between aid and economic growth, but I do not know of any studying how aid affects level of incomes (presumably this is due to the fact that aid is primarily given to relatively poor countries). The unconditional relationship between aid and growth seems weak. In any case, we are looking for a hypothetical counterfactual (aid/income in the absence of aid), and so for purposes of illustration numbers like these will have to do.

illustrative purposes. Taking their data for government consumption in 1987 US-dollars (aid budgets are not measured in terms of purchasing power parity), the average for the developing countries in their sample was 14,7% in 1974-83. If we take this as the status quo, and add some for other components of the government's budget, we might take $1 - \beta^S$ to be about 0,3 in an average developing country. Using these numbers, $\overline{A}^S = 2,33y$. So even with governments wanting a large public sector, which presumably also had great problems financing their expenditure plans in the aftermath of the debt crisis, the donor community would have a hard time buying any influence whatsoever.

Granted, in a more disaggregated model, it seems reasonable to expect that the requirement for being influential for specific goods or sectors would be less daunting. Still, the conclusion that aid ceases to be fungible if the sum is large enough is supported by the empirical study of Boone (1996). He finds that "[i]n small countries, or countries where the aid/GNP ratio is extremely large (over 15% of GNP) [...] aid does lead to higher investment." This contrasts with his general conclusion, namely, "[t]he marginal propensity to consume from aid is insignificantly different from one and the marginal propensity to invest is insignificantly different from zero." In this perspective, donor fatigue is to be expected.

7 Is Donor Influence Desirable?

Given the current emphasis on the ownership, the implication of the "back-of-the-envelope" calculations of the last section might not be negative. And the conclusion fits well with the generally negative reviews of the effectiveness of conditionality in inducing policy reform. According to Killick (1998), for instance,[21] "Our country survey attested to the frequency with which differences of interest [between IFIs and governments in recipient countries] occurred and the negative effects of these on conditionality implementation. It was precisely because of the strength of these considerations that we could show in Chapter 4 the large importance of 'ownership' as a determinant of implementation, and why the evidence in Chapter 6 showed domestic political forces normally carry the day in decisions about economic policy." (pp. 171-

[21] Other notable studies on conditionality (in relation to both aid and multilateral lending) include Mosley, Harrigan, and Toye (1991) (on the World Bank), Killick (1995) (on the IMF), and World Bank (1998) (on aid in general).

72, quotes in original) We have not explicitly modelled conditionality, for exactly the reason that it cannot be expected to work well given the lack of legal means by which enforcement of the conditions could be made credible. It is clearly possible to design "contracts" which would hold the governments to their participation constraints, but there are no courts in which to enforce these, and one is thus left with the carrot and stick of giving or withholding financial assistance.[22] Whether such threats and promises are credible, and if credible, sufficient, to instigate reform in recipient countries must thus be examined.

I have examined the credibility issue by using an equilibrium concept that rules out empty threats and promises. For instance, when the donor moves last, we have seen that it will spend its total budget, even though it could have withheld funds if their contribution to the final outcome was negative given the tax rate chosen by the government. It is never optimal for the donor to do so, but this just goes to show that statements like "we will reduce our disbursements of aid by x% if you do not choose a tax rate of z" are not credible.[23] The constraints on donor behaviour implied by the concept of sub-game perfectness put a question mark on the results derived in a well-known paper by Rodrik (1989). He studies the impact of aid on trade reforms assuming that a donor makes a one-time offer of aid contingent on reforms and finds that this may lead a government which is not in favour of reform to pretend otherwise in order to cash in before reversing their trade policy stance. The possibility of reform reversal has a negative impact on domestic investment. However, the problem is founded on the unrealistic assumption that aid can be made contingent on the actions of the recipient country government. Thus, whether they hold up in a more realistic model remains to be seen.

I have also shown that the funds required to influence resource allocation are sizeable compared to real aid flows. True, the reform we consider is very stylised, amounting to a reduction in the average tax rate compared to the status quo. Still, a non-trivial pattern of the impact of aid on policies emerged. Researchers such as Burnside and Dollar (1997) has found that,

[22] On the design of formal aid contracts, see e.g. Pedersen (1995a,b) and Svensson (1995). Killick (1998) provides "meat to the formal bone" by discussing the principal-agent approach to multilateral lending based on an extensive review of the empirical literature and new country case studies from South-east Asia and Latin-America.

[23] Of course, a model in which the aid budget is endogenous is even better equipped to deal with the credibility issue. This must await future research.

empirically, aid seems to have had little impact on economic policies in recipient countries.[24] Based on the model developed here, this is to be expected from an average of countries, since the link from aid to policies will depend on e.g. the details of the tax system. While the model is admittedly simple, its implications thus sits well with the well-documented lack of success of conditionality.

According to the model, this is perhaps all the better, even for the donor, at least in democratic recipient countries. We have seen that the level of development assistance might affect whether the median voter of a recipient country prefers a reform government to one wedded to the status quo. In fact, if the donor's actions decisively affects the domestic equilibrium, i.e., changes the probability that one of the political alternatives wins from 1 to 0 (or vice versa), it is to the disadvantage of a reform government! In light of the finding of Dollar and Svensson (1998) - that democratic governments tend to be more successful reformers - it is therefore tempting to advise donors (and public lenders) not to leverage their resources in order to achieve a level of aid at which influence can be had, and to concur with the conclusion of these authors: "[T]he role of adjustment lending is to identify reformers not to create them." (p.4)[25]

8 Final Comments

The conclusion in the last paragraph does not necessarily imply that the task of donors becomes simpler, only that they should stop throwing good money after bad. In the model used here, neither aid nor policies affects the size of the domestic pie (aid increases the total pie 1:1). The size of the domestic pie is given, and both aid and tax policy only affect the allocation of the sum of domestic and foreign resources available to the country in question to private and public consumption. In reality, of course, both matter. A strong

[24] Admittedly, much can be said about the construction of their "policy index", consisting of measures of inflation, budget surplus, and trade openness, even beyond the obvious that strictly speaking none of the components are policy variables.

[25] Dollar and Svensson (1998) consider a range of political variables such as regime type and degree of political instability, as well as input variables under the control of the World Bank (e.g. amount of resources allocated to loan preparation and supervision). They find that the former predicts reform success (as defined by the Operations Evaluation Department of the Bank) in a sample of adjustment loans made by the World Bank, while there is no connection between the latter and outcomes.

conclusion of the extensive empirical literature on policies and growth, for example, is that good policies foster economic growth. And some evidence is starting to accumulate to the effect that while the unconditional relationship between aid and growth is weak, aid works when policies are sound. Thus, the next step should be to allow for links from policies to the income level (or the growth of income). Foreign development assistance will then have an impact whether it affects domestic policies or not (the former should be expected, though).[26]

It follows from the above that development assistance will be most valuable if it is directed towards countries in which the government pursues, or intends to pursue, policies that increase the level of income or its growth rate and reduce income inequality and poverty. I have assumed that everybody has the same share of income, but this is, alas, not a realistic description of actual developing countries. Income distributions are highly skewed in favour of the upper deciles (or worse), so the task facing donors is not only to pick governments which will increase the aggregate or average income of their poor country, but to single out those which are willing to distribute the resources of their societies more equitably too. This is no mean task. Setting preconditions for loans already has a long tradition with the multilateral lending institutions, but to repeat myself once again, this has not had much of an impact on reform success. Preconditions are meant as a screening device to help "good" governments separate from bad ones. However, the practice has not solved the adverse selection problem in which status quo governments pose as reformers in order to cash in on "conditional" foreign financing.[27] This they can do because there is a great difference between adopting re-

[26] Such an extension would make possible an investigation of two competing hypotheses about the impact of aid on the decision to reform; i) that the decision hinges on foreign assistance to help smooth the transition to a new equilibrium, and ii) that crises are the midwifes of reform, and that concessional financing will thus induce governments to postpone the hard choices. A formal model of the benefits of crises for reforms is provided by Drazen and Grilli (1993), based on the work by Alesina and Drazen (1991) on the delay of fiscal stabilisations. Casella and Eichengreen (1994) have studied the effects of aid in that framework, and conclude that these depend crucially on the timing of both announcements and disbursements.

[27] This is an adverse selection problem because it seems reasonable to assume that different types of governments have different intentions with respect to fulfilling the requirements of conditionality. In addition, there will usually be a moral hazard problem regardless of the intentions of the government, because the benefits and/or costs of carrying out reforms might vary with the state of the economy or polity.

forms on paper and actually implementing them, and the punishment for non-implementation has been weak, due to e.g. the disbursement imperative of the multilateral financial institutions (or the "Samaritan's Dilemma" of bilateral donors piggy-backing on the conditionality of the multilaterals).[28]

To this, it might be added that governments change, particularly in low-income countries, which are more unstable politically than high-income countries. Sometimes, and more regularly in recent years, this is by democratic means. It is therefore not only the intentions of the current government that must be probed, the path of likely governments must be estimated. This requires a greater understanding of the political economy of recipient countries - e.g. how interests are organised, the ideology of the main parties, and the electoral system - in order to be able to predict the impact of reforms on the distribution of income among politically influential groups, the support of political parties, and, ultimately, on the domestic political equilibrium which determines whether reforms will be adopted, implemented, and sustained.

But the picture is not all gloom and doom. There are many examples of surprise reformers (see e.g. Cukierman and Tommasi 1998a,b). Policy choice is a function of not only political preferences, but of beliefs about the links between policies and outcomes. Beliefs might change even when ideologies do not, whether on the basis of accumulated experience or through persuasion. So even if money cannot buy reformers, careful analysis of where to put one's bets might in combination with a policy dialogue based on long-standing relationships enable donors to make a difference.[29]

In conclusion, the main contributions of this paper are

* to show that while commitment versus discretion is irrelevant to the outcome of aid games of the type studied here, the recipient government's ability to tax transfers to the private sector (or administrative capacity more generally) is very important;

* to provide a definition of fungibility when both the donor and the

[28] I use quotes on the "Samaritan's Dilemma" because most bilateral donors are not (pure) Samaritans. See for example Alesina and Dollar (1998) for an empirical investigation of bilateral donors' motivations for giving aid.

[29] That information transmission is most efficient when preferences are similar, is well-known from "cheap-talk" games. A similar mechanism is what lies behind the results of Cukierman and Tommasi (1998a,b), who demonstrates that sometimes, it takes a Nixon to go to China; i.e., that one's own kind is best placed to convince one of the need for bold action given the state of the world. This is because someone with similar preferences will not try to take advantage of one's incomplete knowledge of decision-relevant information the way a political adversary might.

recipient acts strategically;

* to show that very large sums are needed if donors are to have any influence over outcomes;

* and to investigate the effect of foreign aid on the political equilibrium in democratic recipient countries.

As already noted, there is plenty of room for expanding on this simple model, something I hope to do in the future.

9 Appendix

9.1 Subgame-Perfect Strategies of Donor and Recipient When a_c Cannot be Taxed

As noted in the main text, for all practical purposes, the strategies of the donor and the recipient are the same regardless of which one of them moves first. Therefore, we shall only derive these strategies for the case where the donor moves last. The proof will be somewhat informal.

Define $U^{j*} \equiv U^j\left(\beta^j y, \left(1-\beta^j\right) y\right)$, and note that this is the level of utility achieved by a government of type j in the absence of aid given that it chooses its utility-maximizing tax rate $1-\beta^j$.

The optimisation problem of the donor is

$$\underset{a_c, a_g}{Max}\, U^D(c,g)$$

subject to $c=(1-\tau)\, y+a_c$, $g=\tau y+a_g$, $a_c+a_g \leq A$, and $U^j(c,g) \geq U^{j*}$; with τ predetermined by the government. The Lagrange function for this problem is thus $\Lambda^D = U^D(c,g)+\lambda\left(A-a_c-a_g\right)+\mu\left[U^j(c,g)-U^{j*}\right]$. The first-order conditions are

$$\begin{aligned}
(A1a)\frac{\partial \Lambda^D}{\partial \lambda} &= A-a_c-a_g \geq 0; \lambda \geq 0; \lambda \frac{\partial \Lambda^D}{\partial \lambda}=0; \\
(A1b)\frac{\partial \Lambda^D}{\partial \mu} &= U^j\left(c^F, g^F\right)-U^{j*} \geq 0; \mu \geq 0; \mu \frac{\partial \Lambda^D}{\partial \mu}=0; \\
(A1c)\frac{\partial \Lambda^D}{\partial a_c} &= \frac{\beta^D}{c^F}-\lambda+\mu \frac{\beta^j}{c^F} \leq 0; a_c \geq 0; a_c \frac{\partial \Lambda^D}{\partial a_c}=0; \\
(A1d)\frac{\partial \Lambda^D}{\partial a_g} &= \frac{1-\beta^D}{g^F}-\lambda+\mu \frac{1-\beta^j}{g^F} \leq 0; a_g \geq 0; a_g \frac{\partial \Lambda^D}{\partial a_g}=0.
\end{aligned}$$

Define $\widetilde{A}$ by $U^j\left(\beta^D\left(y+\widetilde{A}\right),\left(1-\beta^D\right)\left(y+\widetilde{A}\right)\right)=U^{j*}$. This is the level of the aid budget at which the "participation constraint" of the government is not binding at the outcome produced by the donor's "first-best" policy $\left\{\beta^D(A+y)-(1-\tau)y,\left(1-\beta^D\right)(A+y)-\tau y\right\}\equiv\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$. As $\beta^D\neq\beta^j$, $j=R,S$, $\widetilde{A}>0$ since a strictly positive amount of resources is necessary to compensate the government for the "inoptimal" distribution of consumption sought by the donor.

Consider first the case $A\geq\widetilde{A}$, that is, the case where the participation constraint of the government is not strictly binding at $\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$. Then the participation constraint is clearly not binding for any other tax rate (than $1-\beta^j$) the government might choose. Thus $\mu=0$, and the donor need only worry about the non-negativity constraints on a_c and a_g. We shall concentrate on the latter, as this is the one which is of importance for the equilibrium outcome. As $\left(1-\beta^D\right)(y+A)>0$, $\exists 0<\tau'\leq 1$ such that $\tau' y=\left(1-\beta^D\right)(y+A)$, $\forall A\leq\overline{\overline{A}}=\left(\frac{\beta^D}{1-\beta^D}\right)y$. Thus, for $\tau\leq\tau'$, the non-negativity constraint on a_g is not strictly binding at $\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$. By choosing this policy, the donor achieves its "first-best" outcome, so it is clearly optimal. For $\tau>\tau'$, the non-negativity constraint on a_g is strictly binding at $\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$, and the donor therefore optimally chooses $a_g=0$ and $a_c=A$.

When $A<\widetilde{A}$, there is a range of tax rates $[\tau'',\tau^{j*}]$, $\tau''>\tau'$, such that the participation constraint of the government is strictly binding at $\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$. However, since indifference curves are convex and $\beta^D>\beta^j$, $j=R,S$, it is obviously the case that the non-negativity constraint on a_g is binding at the aid policy that satisfies the participation constraint. Therefore, the donor cannot settle for satisfying the participation constraint, and will still choose $\{A,0\}$ for $\tau>\tau'$. It follows that we have $\mu=0$ at the donor's optimum in this case as well.

For $A>\overline{\overline{A}}$, $\nexists\tau'\leq 1$. Therefore, neither the participation constraint nor the non-negativity constraint on a_g is strictly binding at $\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$. The donor is therefore free to choose this policy regardless of τ.

Finally, to complete the proof, we must show that $\overline{\overline{A}}>\widetilde{A}$. Since $U^j(\cdot,\cdot)$ is strictly increasing in both arguments, $\overline{\overline{A}}>\widetilde{A}\Leftrightarrow U^j\left(\beta^D\left(y+\overline{\overline{A}}\right),\left(1-\beta^D\right)\left(y+\overline{\overline{A}}\right)\right)>U^j\left(\beta^D\left(y+\widetilde{A}\right),\left(1-\beta^D\right)\left(y+\widetilde{A}\right)\right)=U^{j*}$, where the equality follows from the definition of $\widetilde{A}$. The proof is then immediate from comparing U^{j*} and

$U^j\left(\beta^D\left(y+\overline{\overline{A}}\right),\left(1-\beta^D\right)\left(y+\overline{\overline{A}}\right)\right)$; noting that as $1>\beta^D>\beta^j$, $\beta^D\left(y+\overline{\overline{A}}\right)=\left(\frac{\beta^D}{1-\beta^D}\right)y>\beta^j y$ and $\left(1-\beta^D\right)\left(y+\overline{\overline{A}}\right)=y>\left(1-\beta^j\right)y$.

In sum, the best response of the donor given its budget and the tax rate, $\left\{a_c^F(\tau;A),a_g^F(\tau;A)\right\}$, is[30]

A/τ	$[0,\tau']$	$>\tau'$
0	$\{0,0\}$	$\{0,0\}$
$\left(0,\overline{\overline{A}}\right]$	$\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$	$\{F,0\}$
$>\overline{\overline{A}}$	$\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$	$\left\{a_c^*(\tau;A),a_g^*(\tau;A)\right\}$

The government knows $\left\{a_c^F(\tau;A),a_g^F(\tau;A)\right\}$ when it chooses its tax policy. If there is no aid, we know that the tax rate $1-\beta^j$ is its optimal choice. Since $\frac{\partial U^j\left(\beta^D(A+y),\left(1-\beta^D\right)(A+y)\right)}{\partial c}<0$ and $\frac{\partial U^j\left(\beta^D(A+y),\left(1-\beta^D\right)(A+y)\right)}{\partial g}>0$ at $\left\{\beta^D(A+y),\left(1-\beta^D\right)(A+y)\right\}$, it is in the government's interest to increase g and decrease c relative to this point. Its "first-best" tax rate given a level of income in the private sector $(A+y)$ (of which A is not taxable), $\frac{1}{y}\left(1-\beta^j\right)(A+y)\equiv\tau^*(j)$, ensures that the final allocation is $\left\{\beta^j(A+y),\left(1-\beta^j\right)(A+y)\right\}\forall A\leq\overline{A}^j=\left(\frac{\beta^j}{1-\beta^j}\right)y$. This claim is proved by noting that, as $\beta^D>\beta^j$, $\tau^*(j)=\frac{1}{y}\left(1-\beta^j\right)(A+y)>\frac{1}{y}\left(1-\beta^D\right)(A+y)=\tau'$. Hence, the donor gets stuck at its corner solution, unable to affect the outcome. As it can attain its "first-best" outcome by choosing $\tau^*(j)$, this tax rate is obviously the optimal choice of the government. $\tau^*(j)\leq 1\Leftrightarrow A\leq\overline{A}^j=\left(\frac{\beta^j}{1-\beta^j}\right)y$. Thus, for $A>\overline{A}^j$, the government cannot attain its "first-best" allocation for an income level equal to $(A+y)$ because of its inability to tax a_c. $\tau=1$ is then clearly optimal for $A\leq\overline{\overline{A}}$, as any reduction in the tax rate would lead to more c and less g, and thus move the outcome further away from the government's "first-best allocation" given the sum of domestic income and aid. When $A>\overline{\overline{A}}$, the government is powerless to affect the

[30]This is not a complete description of the sub-game perfect equilibrium strategy of the donor since we have not investigated its optimal response if for some reason the non-negativity constraint on a_c is binding. It can be shown that for certain levels of the donor's budget, there exists a $\tau'''<\tau'$ such that for $\tau<\tau'''$, the non-negativity constraint on a_c is strictly binding. Faced with such tax rates, the donor will choose $\{0,A\}$. Such tax rates would thus result in an outcome with more c and less g than the donor wants. Since the government wants less c and more g than the donor, instigating such sub-games is clearly not optimal for the government. Hence, for the sake of brevity we ignore them.

outcome, because the donor now wants $g > y$. The optimal strategy of the government is therefore as given by (9) in the main text (if negative values of τ are disallowed, but this is of no importance for the equilibrium), and the outcome follows straightforwardly from the strategies of the two players.

9.2 Political Equilibrium

The "virtual" opponent of R when $A \in \left[\overline{A}^S, \overline{A}^R\right]$ is defined as the type of government that would have optimally chosen the outcome generated under an S-government. Since private consumption is equal to A with an S-government in power, the preferences of the "virtual" opponent can be derived from $\widetilde{\beta}(y+A) = A \Leftrightarrow \widetilde{\beta}(A) = \frac{A}{y+A}$. As $\overline{A}^S > 0$, $\widetilde{\beta}(A) \in (0,1)$. Moreover, $\frac{\partial \widetilde{\beta}(A)}{\partial A} = \frac{y}{(y+A)^2} > 0$. Thus, as $\widetilde{\beta}\left(\overline{A}^S\right) = \beta^S$, $\widetilde{\beta}\left(\overline{A}^R\right) = \beta^R$, and $\beta^R > \beta^S$, $\widetilde{\beta}(A) \in \left[\beta^S, \beta^R\right]$. $\beta^I(A)$ is then found from $U^I\left(\beta^R(A+y), \left(1-\beta^R\right)(A+y)\right) = U^I\left(\widetilde{\beta}(A)(A+y), \left(1-\widetilde{\beta}(A)\right)(A+y)\right)$, i.e., it is the weight placed on the utility of private consumption by the voter(s) who is (are) indifferent between electing R and S (represented by its "virtual" sister party). It is straightforward to verify that $\beta^I(A)$ is given by (17) in the main text; and, using the procedure in Appendix A of Hagen (1999), that $\beta^I(A) \in \left(\widetilde{\beta}(A), \beta^R\right)$, $\forall A \in \left[\overline{A}^S, \overline{A}^R\right)$. The derivative of (18) with respect to A is

$$(A2)\frac{\partial \beta^I(A)}{\partial A} = \frac{1}{\left[\ln \beta^R - \ln \widetilde{\beta}\right] + \left[\ln\left(1-\widetilde{\beta}\right) - \ln\left(1-\beta^R\right)\right]} \frac{\partial \widetilde{\beta}}{\partial A}\left[\frac{\beta^I}{\widetilde{\beta}} - \frac{1-\beta^I}{1-\widetilde{\beta}}\right] > 0,$$

$\forall A \in \left[\overline{A}^S, \overline{A}^R\right)$ since $\beta^I(A) \in \left(\widetilde{\beta}(A), \beta^R\right)$ and $\frac{\partial \widetilde{\beta}(A)}{\partial A} > 0$. We have

$$(A3)\ \lim_{A \to \overline{A}^R} \beta^I(A) = \lim_{A \to \overline{A}^R} \frac{\frac{1}{1-\widetilde{\beta}}}{\frac{1}{\widetilde{\beta}} + \frac{1}{1-\widetilde{\beta}}} = \beta^R.$$

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Chapter 5

Local-Level Politics and Policy Implementation*

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Abstract

In low-income countries, the greatest volume of political activity is found at the implementation stage of the policy process. This is due to both the centralised nature of policy-making and the presence of political powers at the local or regional level ("strongmen"). Thus, one should look for possible explanations of the widespread discrepancies between governmental plans and output in these countries at the implementation stage. I study the interaction among low-level bureaucrats, central government officials, and strongmen assuming the latter to be better informed about the choices of officials charged with policy implementation than the political principals are. Implementation gaps are shown to be complex functions of the preferences of the players and their costs of taking action.

1 Introduction

The New Political Economy (NPE) is one of the fastest growing sub-fields of economics. The main thrust of the research agenda in NPE has been aimed at explaining the choice of economic policy. While important in its own right, this approach entails an implicit assumption that the choice of a policy determines what policy is actually pursued. Such an assumption is not wholly innocuous, however. In most cases, policies are indeed chosen by politicians.[1] Still, politicians do not implement the policies chosen. That is left to another group of actors, namely, bureaucrats. And at least since the influential early work of

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[1]The qualifier most is used because politicians sometimes delegate policy-making powers to bureaucrats. For example, in industrialised countries regulatory policy is often delegated to bureaucratic agencies.

Niskanen (1971), it has been accepted that bureaucrats might not be of the Weberian ideal type. They might have their own goals, and these could differ from those of their political principals. Therefore, policy choice does not necessarily determine what policy is implemented. This will depend on the incentives given to the bureaucrats and the control exercised by the politicians, a point elaborated on in the next section.

Assuming that bureaucrats are "perfect" implementors is of course a way of focusing on the choice of economic policy. This approach might tell us much about the effects of different political institutions and ideologies on policy choice. Such an approximation might also lead to a better understanding of the influence of interest groups in the industrialised countries. However, as pointed out by Grindle and Thomas (1991), in poor countries the pressures from affected groups emanate mainly after a policy has been adopted. That is, "vested interests" tend to focus on the implementation phase of the policy process. There are several reasons why there is such a difference between high- and low-income countries. In the latter, the policy process is relatively centralised and often confined to discussions among a small group of persons at the apex of the political structure. This holds even when the regime is nominally democratic, since both political parties and formal interest groups tend to be relatively weak. The lack of organisational power on the part of societal interests is both a cause and a consequence of the fact that people do have influence at the implementation stage. The societal structures of many poor countries, where most individuals are involved in strong informal networks such as family, clan, tribe, or patron-client relationships, create an environment where people expect that they can achieve exemptions from rules and regulations through personalised exchanges with government officials. This need not imply outright corruption, i.e., the explicit exchange of money or "gifts" for favours, although this certainly is a widespread phenomenon; frequently it involves the exchange of favours, with a favour today creating an obligation on the part of the receiver, often sanctioned by other members of the relevant network, to reciprocate in the future. Hence, government officials in the field do not distribute the resources at their disposal or exercise their regulatory powers according to formal rules emanating from the top of the bureaucracy or the central government. Instead they are guided by a complex web of past obligations, present "demand", and potential future reciprocity. In combination with weak structures of bureaucratic control, compounded by reciprocity games within the bureaucracy, this is surely one of the most important reasons why there is such a large gap between planned and actual policy in the so-called Third World.

Another important feature of the implementation environment in many low-income countries is the presence of politically powerful figures at the local or regional level: large landowners, industrial magnates, and ethnic or religious leaders are obvious examples. Sometimes they are the patrons of local-level public employees. On other occasions, they are informal lawmakers, explicitly or implicitly laying down the rules of the game by virtue of their economic, political, or social power. Frequently, then, they have an impact on how governmental policies are carried out within their spheres of influence. This impact might be

magnified in circumstances where the potential for political instability is great, because then national-level politicians and bureaucrats might find that they need the stabilising influence of these local "strongmen".[2]

My aim in writing this paper is to provide a preliminary investigation of the policy implementation process in low-income countries. Specifically, the analysis will be aiming at indicating answers to questions such as: What determines the extent of the deviation between the chosen policy and the one actually implemented? Is a hands-on approach by policy-makers required in order to minimise the gap between actual and chosen policies, or can a hands-off policy be sufficient to keep implementation gaps within reasonable bounds? When do vested interests have influence over bureaucrats charged with implementing policies?

The next section briefly reviews the literature on political control of the bureaucracy. I then look at the implications of certain idiosyncratic features of the policy process in poor countries - specifically, the presence of local-level political powers and the politicians' desire for a stable polity - for the tasks laid upon low-level bureaucrats. Section four is devoted to setting up the basic model. In the following two sections the results generated by two different versions of that model are derived. The last section contains a summary of the results as well as a discussion of possible extensions and generalisations.

2 On the Political Control of the Bureaucracy

The formal literature on bureaucracy starts with Niskanen's (1971) seminal work on monopoly bureaus. Niskanen assumed that bureaucrats have an informational advantage in terms of their own activities relative to their political principals, specifically, about the costs of producing various activity levels. This advantage stems from their expertise in the substantive areas in which their bureaus are employed. He also assumed that a bureau is the sole provider of the services sought by the political principals and that the bureaucrats have goals different from those of the principals, such as power and prestige. Assuming that the size of the bureau's budget is an adequate representation of many of these goals and that the bureaucrats can make "take it or leave it" offers to the politicians, Niskanen predicted that a bureau would be able to maximise its budget subject to the budget covering the production costs of the bureau's services. In the process, all the surplus from the production of services would accrue to the bureaucrats.

Niskanen's contribution has spawned a small literature of its own on the consequences of agenda setting power.[3] On the other hand, other researchers have questioned several of Niskanen's assumptions, in particular those relating to the institutional structure of the budget process. For example, Miller and

[2]This is the term used by Migdal (1988) in his study of the strength of the state relative to society in low-income countries.

[3]For a summary, see Rosenthal (1990). Agenda setting is of course in many contexts other than the one considered here, for instance, in legislative voting models.

Moe (1983) assert that the relationship between politicians and bureaucrats is one of bilateral monopoly, and that it might be the politicians who make the bureaucrats offers and not the other way around. As these authors show, the results are then generally not as favourable to the bureaucrats as they are in Niskanen's world.

Still, work done in this area after Niskanen has generally retained two of his assumptions, namely, that there is an informational asymmetry between bureaucrats and politicians (working in the former group's favour) and that the two groups of agents might not have identical objectives. Bureaucrats are experts in their field of work while politicians rarely have the luxury of spending time and resources to specialise in specific policy issues. Even when they acquire some such knowledge as a by-product of their work, such as when they sit on legislative committees charged with controlling a certain type of policy, the bureaucrats are likely to possess information about the details of their operations that the politicians do not. I have already mentioned that the costs of providing their services might be private knowledge to the bureaucrats. Other examples include the consequences of alternative policies in terms of likely outcomes and costs of implementation, the progress in implementing the choices of the politicians, and even what alternative courses are feasible. When combined with the fact that, realistically, bureaucrats will have preferences that differ from the politicians - whether these are economic (the bureaucrats' desire for the greatest possible consumption and leisure) or political (power and different ideologies) - some rather undesirable consequences from the viewpoint of the politicians might result, such as shirking, corruption, or distortions of both policy choice and implementation. In fact, in the extreme, the result might be technocratic rule, with the bureaucrats making policy and not the politicians.

Though, the principals are not powerless vis-à-vis their agents, even when the informational asymmetry or preference differential is great. This is not the place for a full discussion of the possible ways in which politicians might structure their interaction with the bureaucrats.[4] Instead I will concentrate on two modes of oversight that politicians might choose: "Police Patrol" (PP) and "Fire-Alarm" (FA).

The terms PPs and FAs were coined by McCubbins and Schwartz (1984). PPs are more centralised, direct, and active than FAs. The politicians might set up structures such as legislative oversight committees and hold hearings, commission outside studies, and request reports from the bureaucrats. In an FA system on the other hand, the politicians rely on interested third parties to inform them when bureaucrats violate their mandate. Consequently, they will provide for mechanisms which enable citizens and interest groups to monitor bureaucratic decisions, such as rules of notification, and for political, administrative, or judicial means of punishing bureaucrats that "stray from the path" that the politicians have set up for them. From the perspective of the politicians, an FA system has the advantage of being relatively cost effective. The costs of monitoring bureaucrats and perhaps also the costs of punishing them

[4] On this, see e.g. McCubbins, Noll, and Weingast (1987, 1989).

for deviations are borne by other agents or institutions: courts, interest groups, and citizens. These cost savings the politicians can spend on constituency services, initiating or passing legislation, or whatever other activities contribute to the fulfillment of their goals. Note that it does not matter whether politicians are purely office motivated, purely driven by ideology, or some mixture of the two extremes: the point is that the time, staff, and monetary resources spent on monitoring in a PP system have alternative uses, and an FA system allows politicians to channel resources into these alternative activities.

On the other hand, FA systems have a drawback relative to PP systems. To the extent that a PP system is effective, it fully reveals the private information of the bureaucrats, albeit for only small sections of the bureaucracy at a time. Since an FA system endows interested parties with the power to "blow the whistle", report, and comment, it opens the possibility for the misuse of such power, i.e., the use of these powers by FAs to consciously mislead the politicians in the hope of tilting the outcome in their favour. Hence, the politicians are involved in two principal-agent relationships, and the cost effectiveness of an FA system must be weighed against the likelihood and consequences of dissembling FAs.[5]

The motivation of the literature on PPs and FAs is the design of the institutional structure of public administration. However, at least so far, the analysis has concentrated on the positive properties of various institutional features which are observed empirically. That is, the models focus on the outcomes of games between politicians, bureaucrats, and perhaps interest groups or courts within given institutional frameworks, not on the optimal design of these structures and processes.[6] The model presented below is in the tradition of analysing behaviour given a framework which seems empirically reasonable. It is related to the work of Lupia and McCubbins (1994a,b) and Epstein and O'Halloran (1995). The former investigate the possibilities of political principals learning the hidden knowledge of their bureaucratic agents in PP, FA, and mixed systems (i.e., systems that incorporate features from both ideal types). However,

[5] There are a couple of potential problems here though. If politicians are to some degree swayed by electoral incentives and voters and members of interest groups are rational, one would have to be a little more careful in explaining why shifting the costs of bureaucratic control from themselves onto individual citizens and pressure groups constitutes an improvement for the politicians. It might be that this division of labour is more efficient for politicians, voters, and interest groups combined since the latter two are directly affected by the policy implemented while the politicians would have to expend resources to acquire information about the actions of the bureaucrats. But to answer this question one must confront head-on the collective action problems of those who are supposed to "work" as FAs. However, because I am not concerned with the choice of institutional structures and do not study the behaviour of groups, these caveats do not apply to the argument made in this paper.

[6] To be precise, there has been little formal analysis of the optimal choice of administrative processes and structures. Epstein and O'Halloran (1994) is a notable exception. McCubbins, Noll, and Weingast (1987, 1989) rationalise existing features of democratic public institutions as reflecting optimal design efforts by elected officials (on the basis of the US framework), but do not provide a formal model to underpin their claims. Of course, this does not invalidate their analysis, but the generality of the claims as well as how the nature of the trade-offs involved vary with conflicts of interests and costs of monitoring, enforcement, and policy deviations cannot be ascertained without taking the relevant factors explicitly into account.

in contrast to them, I allow the bureaucrats to be active players in the game. Epstein and O'Halloran construct a model of FA oversight by interest groups. They generate results which resemble some of mine even though the actions of interest groups are cheap talk, while the FA in my approach engage in costly signalling.

The focus of the model presented in this paper focuses on the more informal aspects of an oversight system. While the discussion of the two modes of oversight is often couched in terms of the different institutional structures they imply, casual empiricism makes it clear that in any political system agents with political clout will be able to "comment" on policy if they wish to, regardless of whether politicians have put up structures that institutionalise the forum in which such comments are made. For example, demonstrations and riots are examples of quite strong comments on policies made outside of formal channels. It follows that one does not have to confine the discussion to legislative oversight. Hence, the political principals do not have to be legislators. They do not even have to be politicians strictly defined. The point is that the actions of third parties might convey information to any principal charged with overseeing a bureaucracy - whether an agency head, a minister, or a legislative committee - regardless of whether FA features are incorporated into a formal system of oversight. In fact, in developing countries, which is the area of interest to us, it is more likely than not that there is no institutionalisation of FA mechanisms. Still, vocal actors who are politically important will be able to get their message through to policy makers if they so wish. Of course, this does not mean that the principal(s) will necessarily heed these calls for investigations and change. This will depend on factors like the costliness of action for the various actors and the degree to which their interests coincide.

Finally, note that the model that follows focuses on the bureaucrats' role as implementors of policy and not on their agenda setting role. In both the approach of Lupia and McCubbins and that of Epstein and O'Halloran, the bureaucrats can be viewed as having the possibility to make policy because they have proposal powers.[7] This, however, will only be of interest in relation to top-level bureaucrats. Here we investigate the behaviour of government officials in the field to see what might be deduced about potential deviations between policy as determined by politicians and the final output of the government. It follows that we do not share the literature's focus on the consequences for institutional choice, although one would hope that further down the road such implications can be drawn. Instead I concentrate on the positive properties of a stylised - though hopefully not too unrealistic - bureaucratic system located

[7] In sum, there are two main areas where differences arise among the three approaches. First of all, the costs that the FA incurs if he acts matters here. In Lupia and McCubbins (1994b), it does so only through a potential penalty for lying, while the cheap talk approach chosen by Epstein and O'Halloran (1995) implies that there is neither a direct nor an indirect cost of action. Secondly, Lupia and McCubbins assume that it is costly for the bureaucrat to make a proposal (but, as noted above, he is not an active player in their model). Epstein and O'Halloran, on the other hand, suppose that it is costless. Since I investigate policy implementation, I assume that there are punishments for deviating from the policy choice of the politicians only if the bureaucrat is caught.

in a low-income country.

3 The Policy Implementation Process in Low-Income Countries

What policy is pursued in a country is determined in a multistage process from initiation via policy choice to implementation. In this section, I will discuss some features common to many societies in Latin America, Africa, and Asia which imply that it is particularly important to investigate the implementation processes in these countries if one is to be able to predict which policy will actually result. As mentioned in section 1, the implementation stage seems to be a relatively neglected part of the policy process in the formal literature on policy-making. However, it seems that in poor countries, there is more political activity at this stage than in high-income countries, where most influence attempts are made at the agenda setting or policy choice stages of the policy process. In the words of Grindle and Thomas (1991, page 66):

> "Large segments of the population in developing countries are not represented in discussions of policy. In fact, much of the participation in policy discussions that occurs in more open democratic countries is replaced in developing countries by more particularistic or clientelistic participation of low-status groups during policy implementation. Citizens and groups excluded from the closed decision making that occurs within ministries or executive councils in capital cities have much greater capacity to approach implementing officials who control day-to-day allocation of resources with demands, petitions, bribes, or other forms of pressures. This tends to increase the extent to which processes of policy implementation are highly political in developing countries."

In many poor countries, another societal feature acts to reinforce the importance of the implementation stage for the final outcome, namely, the fragmentation of social control. Often, the rules of the game are not simply the laws and regulations established by the central government. In fact, in some areas, these rules might be totally subjugated to those laid down by local or regional leaders such as tribal chieftains, religious leaders, and large landowners. I will use the term strongmen to refer to these agents. Their domination over the "commoners" within their area can be based on religious or traditional authority, more mundane powers such as control over land, credit, and jobs, or a mixture of both. An example of the more instrumental type is patron-client relationships. These are asymmetric personal relationships of repeated exchange in which the patron provides each client with mainly economic resources in return for political or economic labour services.[8] Because of the voluntary and instrumental

[8] For elaborations on this definition and the character of patron-client relationships, the reader might consult the articles in Schmidt, Guasti, Lande, and Scott (1977). Formal investigations of rural power relationships include Basu (1986) and Naqvi and Wemhöner (1995).

nature of the relationship, the patron has to be able to provide the clients with resources on a fairly regular basis. Any competing sources of land, loans, jobs, and the like threaten the hold that the patron has over his clients. The state is of course an example of such an alternative provider of resources. Therefore, a patron will be inclined to attempt to control the distribution of governmental resources either directly by seeking to become a local-level state employee or indirectly by placing "his" men in important positions or bribing or intimidating central government appointees into accommodating his demands. Thus, when strongmen have power at the local level, there will be pressure towards tilting the distribution of state resources and the implementation of central government policies in favour of them.

Central government decision makers might not look too adversely upon such local or regional compromises. The reason is that they might find it in their interest to placate the strongmen in return for the latter using their social control to prevent political challenges to the central government from arising and to bolster support for it (at least nominally). In many low-income countries, there are potentially explosive forces such as great inequalities of income and wealth and ethnic and regional differences. These forces make the regimes fragile, and they might therefore place great stress on preventing any disruptive events from occurring. For example, riots and demonstrations might inform opposition groups that there is widespread dissatisfaction with the regime and hence induce them to step up their efforts to undermine the current rulers.[9] In a democracy, elections might be swayed by such events when they are widely seen as conveying private information about the government, e.g., its (in)competence.[10] It follows that governments seeking to stay in power are willing to pay a certain price to the people in control of the masses at the local level.[11]

There are of course other potential sources of pressure on implementation officials such as local or regional politicians or bureaucrats from other central government agencies. Many governmental policies will affect the standing of politicians below the national level and they will therefore seek to influence implementation in their favour, for instance, by securing as many "pork barrel" projects as possible for their districts. On the other hand, the political clout of low-level politicians might facilitate the implementors' jobs. Likewise, bureaucrats from other central government agencies might control resources or be responsible for policies that have consequences for the effects of the policies that implementors manage. The various sources of pressure on implementation officials are depicted in figure 1.

In this paper, I will concentrate on the "Triangle of Accommodation" created by implementors, strongmen, and central government officials.[12] It will be

[9] See Bates and Weingast (n.d.). The work of Lohmann (1993) could be adapted to the present context to produce such effects.

[10] For a similar argument with respect to public opinion polls, see Cukierman (1991). Of course, mass political action could also influence elections by signalling other types of private information, c.f. Lohmann (1994).

[11] C.f. Migdal (1988).

[12] This term is due to Migdal (1988), who focuses on the purely local triangle made up by implementors, local politicians, and strongmen.

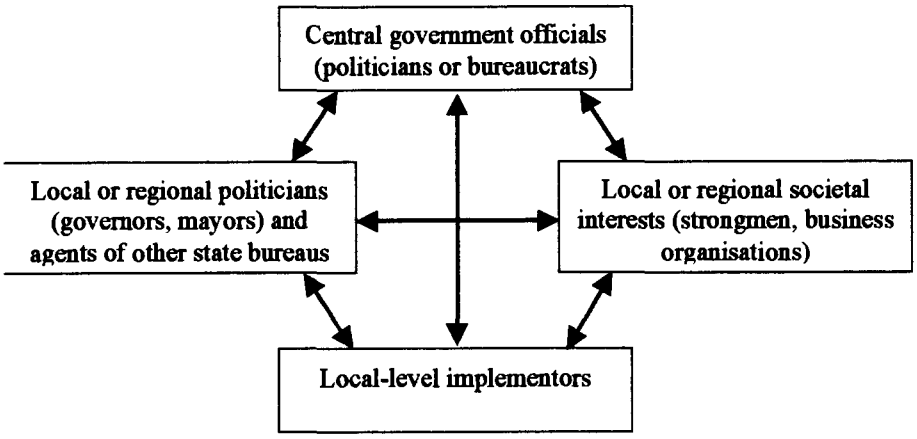

Figure 1: triangles of accomodation

assumed that the central government officials, whether these are politicians (e.g. ministers) or bureaucrats (e.g. department heads), are concerned with both the implementation of a certain policy and the need to avoid public conflict over the policies. This in turn is reflected in the tasks laid upon the implementors, who are supposed to be as diligent as possible without creating a "scandal".[13] The bureaucrats are motivated by career concerns - including power and status - and will fulfil their tasks in a manner which maximises the expected present value of the net benefits from their career trajectory. The strongmen have an interest in the policy being pursued and might be willing to use their social control to create public disturbances if this contributes to a more favourable policy outcome from their perspective. In sum, the focus is on potential political sources of deviations in policy implementation. The choice of this focus does not imply that other channels of influence such as corruption or intimidation of bureaucrats are considered unimportant. On the contrary, they are certainly part of a complete explanation of why plans are not fully implemented. However, the empirical literature implies that political explanations should also be considered and this paper takes a first step in that direction.

4 The Model

Three agents are assumed to be involved in the policy implementation process: a bureaucrat (B), a strongman (S), and a politician (P). B is a low level bureaucrat charged with implementing a policy desired by P in the field. In the

[13] For example, in a case study of a Mexican federal agency, Grindle (1977) notes that the demands made upon local-level bureaucrats from above were twofold: "*(1) to implement centrally determined policies, and (2) to solve local level problems without public scandal.*" (p.129)

geographical district B is administering, S has a high degree of control over "commoners". This control he might attempt to use to influence B's choice, because B's future career is determined not only by his implementation efforts; P also wants B and his peers around the country to fulfil their tasks without generating harmful controversy. However, P cannot costlessly monitor what B does. Instead he relies on FA. More specifically, if there are protests or complaints about the implemented policy, P evaluates whether it will be worthwhile to spend resources to find out what B has done. I assume that if P chooses to monitor, the policy is implemented as planned. Hence, the decision to monitor or not is equivalent to deciding whether to pay a "fee", the costs of monitoring, to be certain that the "ideal" policy is implemented.

S cannot play his role as an FA for free. Even with a high degree of social control, S must bear the expenses of organising the protests of his "subjects".[14] Therefore, he might decide that bringing the case to P's attention is not worthwhile, in which case the policy will be what B has chosen to implement.

All actors have a policy ideal, denoted by x_i^*.[15] The ideal point of P is assumed to be the policy that has been chosen, i.e., x_P^* is to be implemented by B.[16] The utility of the actors depends on the deviation of the actual policy, y, from their ideal point:

$$(1) u_i(y) = -|y - x_i^*|.$$

The set of all possible policy choices is a compact interval on the real line. Specifically, $x_B^*, x_S^*, x_P^*, z, y \in W = [\underline{w}, \overline{w}] \subset \Re_+$.[17]

In addition to the loss from deviations of the policy outcome from his most preferred alternative, B suffers a utility cost if S decides to stage "riots" in response to B's implementation choice, z. This loss, denoted by ϕ, is meant to represent the damage done to B's career as a consequence of failing to "handle the situation", as well as the penalty imposed for deviations from the policy

[14] For example, if S is a large landowner, he has to bear the costs of driving his tenants into town to demonstrate and at the same time forego the output that they could have produced during the protests.

[15] The reason why B is assumed to have an ideal point is that I want to capture the fact that he might either have policy preferences himself or be "someone else's man". For instance, the strongman might have been able to ensure the appointment of one of his protégés. Or the local governor might succeed in pressuring national-level politicians into putting one of his confidants in charge of policy implementation in his district. Political appointments to bureaucratic positions are widespread in poor countries. Grindle (1977) provides some examples from Mexico. See Geddes (1994) for evidence of this practice in other Latin American countries.

[16] The reason why P's choice is not explicitly model is that, realistically, it would depend on factors not considered here. Even assuming that the only type of consideration entering his calculus was the reactions of strongmen, any country has many of these, and so P would have to take into account the reactions of all of his implementors and the strongmen they face. Such an analysis is beyond the scope of this paper (but see the comments in the final section).

[17] $W \subset \Re_+$ is only a convenient normalisation which simplifies the exposition without affecting the generality of the results.

choice of P.[18] ϕ is assumed to be strictly positive, finite, and constant. The latter implies that it does not depend on the magnitude of protests - riots, demonstrations, petitions, and the like - organised by S. The marginal cost to S of using his social control, κ, is also assumed to be strictly positive, finite, and constant. The assumptions of constant losses to B from protests within his jurisdiction and constant marginal costs of staging these for S are not only made for the sake of computational simplicity. It is difficult to have a definite notion of the shape of these cost functions. For instance, realistically, a strongman has many different ways of protesting, and these could have different cost functions. In the absence of any specific priors as to the relation between these costs and the level of ρ, I opt for the simplest possible representation so as to facilitate the exposition of the basic forces at work in this three-player game. Furthermore, assuming risk-neutrality is the more conservative choice in such a situation.

Finally, P pays a fixed fee c - to be interpreted as the opportunity cost of the time and monetary resources spent by P in figuring out what has transpired - if he decides to monitor what has happened in B's district. All player's objective functions are additively separable in policy and non-policy elements, with the latter entering linearly.[19]

All parameters except x_B^* are common knowledge. I assume for the moment that P does not know B's ideal point. However, I will note what difference it would make to the results if this restriction was eased. Observe that it does not matter whether S knows x_B^* or not. He moves after B and observes z. Therefore, he cannot influence the choice of z strategically and he does not have to form an opinion of what z is based on common knowledge information. However, as mentioned above, P is assumed not to observe directly what B's choice is. In order to make an informed choice of a strategy, he thus have to form beliefs over the location of z in $\Re$, and whether or not he knows x_B^* will affect these beliefs.

An example of a situation approximating the one described here would be where a local-level bureaucrat is entrusted with allocating a fixed budget between two different projects. His superior instructs him to allocate a certain proportion to each project. However, he might decide to implement a different spending pattern. The reason for this is that his own benefits from the projects, or those of his family, friends, or other relations, could differ from those of his principal. Still, he has to take into account that the local strongman has his

[18] Strictly speaking, ϕ should then be higher if P chooses to monitor than if he chooses not to, because in the latter case a deviation is never detected. However, as will be come apparent, what matters for the equilibrium is that there are costs for B associated with protests by S which are not incurred in the absence of such unrest. Therefore, for the sake of notational simplicity, I do not include a separate parameter denoting the costs of being caught deviating in policy implementation.

[19] In the case of S, the latter assumption can be interpreted as saying that the resources spent on protesting are small relative to his endowment, so that his utility of consumption is only marginally affected. To avvoid unnecessary notation, I do not include a parameter representing the endowment of S; but the assumptions $W \subset \Re$ and $\kappa > 0$ ensure that the maximal level of protest that S would be willing to stage is finite (see the next section), which seems reasonable. Hence, so are the costs incurred. Moreover, I do not include the costs to P of the protests, which presumably are the source of the implicit incentives given to B. These are in any case immaterial here since P moves after S.

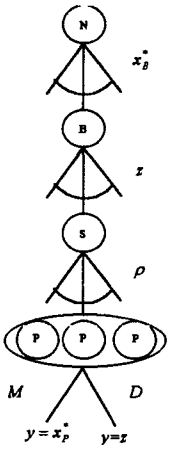

Figure 2: timing of moves

opinions about the budgetary allocation too and could be willing to use his considerable influence over the local populace to stage social unrest that might draw the bureaucratic superior's attention.

The timing of this sequential game is as follows. "Nature" first draws the policy ideal of B according to the continuous density function $f(x_B^*)$ (with cumulative distribution $F(x_B^*)$). B then decides what his optimal implementation choice is. Upon observing z, S has the options of keeping silent ($\rho = 0$) or organising a certain magnitude of protests (some $\rho > 0$). If he opts for the former, the case is not brought to P's attention, so the game ends and payoffs are awarded accordingly. However, if S chooses a positive level of protests P must decide whether or not to incur c in order to monitor B. This choice must be based upon the signal sent by S and the common knowledge parameters, which P can use to update his prior probability distribution over the possible values of z. If P monitors (M), he get his most preferred policy, x_P^*. If he does not monitor (D), the game ends with z being the final outcome. Thus, there is an implementation gap if $y \neq x_P^*$, and the size of this gap is $|y - x_P^*|$. The timing is illustrated by the schematic game tree in figure 2 for the general case where P has a move following every signal from S.

The reason why P is assumed not to be involved in the game if $\rho = 0$ is that this is how an FA works - no alarm means no action. Furthermore, casual empiricism seems to confirm that this is how the implementation process generally works; if there is no "fuss", the top of the bureaucracy ignores what goes on further down the hierarchy, particularly in the periphery. However, since this strategy clearly makes possible collusion between low-level bureaucrats in the field and interested third parties, it would be interesting to see if this sort of behaviour constitutes part of the equilibrium of a game between rational actors. Therefore, in section 6, I consider the general case in which P might respond to

the silence of S by checking on B if it is optimal to do so. But, first of all then, the restricted case.

5 A Pure Private Fire-Alarm

The equilibrium concept that will be utilised in the analysis of this game is Perfect Bayesian Equilibrium (PBE). In a PBE, the players' strategies are optimal given the equilibrium strategies of the other players and their beliefs. That is, whenever a player is to make a move, he chooses the action that maximises his utility given his beliefs about the history of the game so far and about how the game will evolve depending on his move. Hence, by requiring behaviour to be sequentially rational, empty "threats" or "promises" are ruled out. The beliefs are updated using Bayes' Rule and the equilibrium strategies of the other players. Since beliefs are only defined along the equilibrium path in a PBE, I will use the criterion of Universal Divinity (UD) due to Banks and Sobel (1987) to refine beliefs following out-of-equilibrium actions when such refinements have consequences for the equilibrium. Of course, beliefs are trivial for B and S. They know all the parameters of the model. In addition, B can perfectly predict the consequences of his move for the equilibrium outcome. S observes B's choice, and can predict with certainty what P will do as a function of his own choice. On the other hand, P does not observe the initial move by B and he does not know that player's ideal point. Thus, the interaction between S and P is a (sub-)game of incomplete information, while the part involving B and S is a (sub-)game where the players have complete (and perfect) information.

As is common in this type of games, I start the analysis at the end. That is, I will first analyse the signalling sub-game involving S and P and thereafter go on to study B's choice of z. The endgame of incomplete information has some peculiarities which sets it apart from a conventional signalling game. First of all, S' real type, represented by his ideal point x_S^*, is common knowledge here. However, we can think of B's choice of z as determining the "type" of S in the eyes of P. The value of z is the information of interest to P, like the type of the sender is to the receiver in an ordinary signalling game, and S might have incentives to conceal it or seek to reveal it. Secondly, though, in contrast with the usual signalling game environment, the sender has the option of choosing an action which precludes the receiver from playing the game. In other words, there is a signal which if it is sent does not "reach" P; signals have to exceed a threshold of strength (zero) before they are "detectable". This contrasts with the usual signalling game set-up, and the next section, where "inaction" is just another message that has to be taken into consideration when the receiver forms his beliefs. Still, the game can be solved in the manner of signalling games, so I will use the terminology of this class of games when it helps illuminating the analysis.

Some preliminary results can be derived by studying S' maximal "willingness to pay" in order to get P to monitor. Given z, there are only two possible outcomes: z or x_P^*. By taking the difference between the values of these two

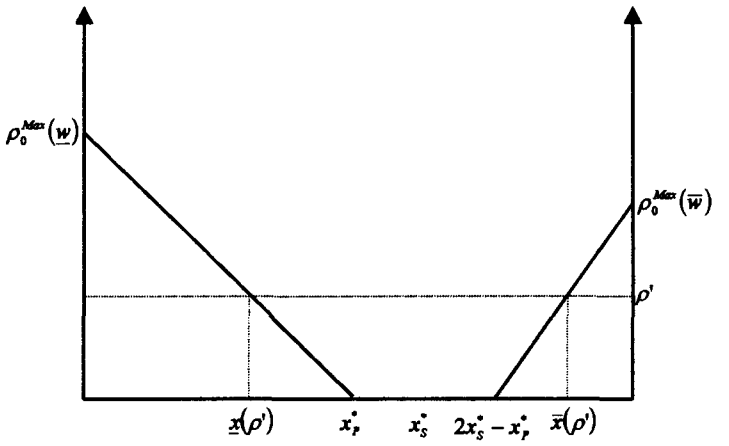

Figure 3: $\rho_0^{Max}(z)$

alternatives according to S' objective function, we find the possible gain to him from having P monitor B's decision. This is obviously the most he would be willing to pay to get x_P^*, the outcome when P chooses M. Since each unit of protest costs κ, we can calculate the corresponding maximal level of protests he would be willing to stage as a function of z. Denote this function by $\rho_0^{Max}(z)$.[20] In the following, I will assume that $x_S^* \geq x_P^*$. The case $x_S^* < x_P^*$ is of course completely analogous. $\rho_0^{Max}(z)$ can be shown to be of the following form:[21]

Definition 1:
$\rho_0^{Max}(z) = Max\left\{0, \frac{|z-x_S^*|-|x_P^*-x_S^*|}{\kappa}\right\}$.

This function is illustrated in figure 3.

Obviously, $\rho_0^{Max}(z) = 0$ for $z \in [x_P^*, 2x_S^* - x_P^*]$. For z in this interval, S prefers not to involve P because B's choice yields a better outcome than x_P^*. Though not completely correct technically, since B and S do not coordinate their actions, I will hereafter speak of $[x_P^*, 2x_S^* - x_P^*]$ as the *collusive interval* (CI).[22] For these values of z, B and S have a common interest in keeping P out of the game; or, more generally, to induce him to abstain from monitoring.

Note two important points. Firstly, we have made no restrictions on the possible size of the protests that S can organise and we do not explicitly incorporate a budget constraint. Still, an upper bound on arises endogenously as long as $\kappa > 0$. Secondly, even though S potentially has an infinite number of "types", an important dividing line separates these into only two categories:

[20] The sub-script 0 is used to distinguish the version of the function that is relevant here from that of the next section, where S might be willing to stage a protest if this deceives P into thinking that "all is well". Similarly, this sub-script is attached to optimal strategies given the assumption that $\rho = 0$ precludes P from making a choice.

[21] When positive, $\rho_0^{Max}(z)$ is derived from the identity $-|x_P^* - x_S^*| - \kappa\rho \equiv -|z - x_S^*|$.

[22] In the main text, I mostly confine myself to the case $2x_S^* - x_P^* < \overline{w}$. If $2x_S^* - x_P^* \geq \overline{w}$, then CI is $[x_P^*, \overline{w}]$.

those that prefer x_P^* to B's choice and those which hold the opposite preference. Hence, when $z \in [\underline{w}, x_P^*) \cup (2x_S^* - x_P^*, \overline{w}]$, S and P have common interests, while a z somewhere in the CI means that they have conflicting interests.

Figure 3 immediately reveals that there can be no fully separating equilibria - equilibria where for each possible value of z S chooses different levels of ρ and hence fully reveal B's choice - in this model. This possibility is in general precluded because for two values of z, 0 and x_S^*, S has a dominant strategy of not protesting at all. For these two implementation choices by B, S is indifferent between z and x_P^*. Since these are the only possible policy outcomes, it is not worthwhile for S to expend resources on protesting B's decision. Hence, we have

Result 1:

There are no fully separating equilibria in the sub-game involving S and P.

In fact, since under the assumptions made in this section choosing $\rho = 0$ is equivalent to getting z with certainty, for all z in CI this is a dominant strategy, as the non-positiveness of $\rho_0^{Max}(z)$ in this interval demonstrates. Here S at the minimum weakly prefers z to x_P^* and when he can get his preferred outcome without cost, he has the best of all possible worlds.

Before we proceed, it is useful to introduce some notation for the strategies of the players. Let $\varsigma(x_B^*)$ be B's strategy, where $\varsigma : W \to W$. The strategy of S will be denoted by $r(z)$, $r : W \to \Re_+$; and that of P by $m(\rho)$, $m : \Re_+ \to \{M, D\}$. An asterisk will be used to denote optimal strategies.[23]

I will first briefly discuss the case $x_S^* = x_P^*$ since it allows me to illustrate certain features of the model, namely, the *Principle of Accommodation*, the *No Monitoring Zone*, *prohibitive monitoring costs*, and *completely informative signalling* in a simple way. Thereafter, the more interesting and more complex case of $x_S^* > x_P^*$ is discussed.

5.1 The Case of $x_S^* = x_P^*$

When $x_S^* = x_P^*$, $CI = \emptyset$: there is no scope for collusion between B and S since the policy preferences of S and P are identical. However, neither party cares about the costs of action incurred by the other party. If monitoring is costless, $m^*(\rho) = M \; \forall \rho$ is clearly the only optimal strategy for P. When $c = 0$, he might as well check regardless of the signal sent by S. In turn, this makes $r^*(z) = 0$ $\forall z$ the equilibrium strategy of S. He has the same policy preferences as P, so he has no incentive to keep him out of the game. Furthermore, given that P always monitors, there is no point in expending resources on attracting his attention to any deviations made by B.

The strategy of P leaves B little room for choice. If he chooses $z = x_B^*$, he will be detected and "punished". Since $\phi > 0$, the only optimal strategy of B is therefore $\varsigma^*(x_B^*) = x_P^* \; \forall x_B^*$. That is, regardless of his policy preferences, B fulfils his task in a true Weberian fashion.

[23] For the sake of notational simplicity, I do not make explicit the connection between the equilibrium strategies of S and P and their ideal points; nor do I show that $m^*(\rho)$ is in fact a function of $\varsigma^*(x_B^*)$ too.

Does this strong result extend to the case where monitoring is costly? Assuming $c > 0$, there are clearly values of z such that it would not pay for P to monitor if z was known to him. The most extreme values of z for which this is true are given by $|z - x_P^*| = c$. That is, they are such that the utility that gets if he monitors, $-|x_P^* - x_P^*| - c = -c$, is equal to the utility he gets from not intervening, $-|z - x_P^*|$. Thus, we have

Definition 2:

The No Monitoring Zone (NMZ) contains the values of z which are such that if P had known that $z \in NMZ$, he would at least weakly prefer not to monitor. Given monitoring costs of c, $NMZ = [x_P^* - c, x_P^* + c]$.

It follows from this definition that monitoring costs can be prohibitive. The cost of monitoring is prohibitive if S would not monitor regardless of the value of z:

Definition 3:

Monitoring costs are prohibitive if the NMZ spans the whole policy space; $NMZ \supseteq W$. The level of monitoring costs at which this occurs is $\widetilde{c} = Max\{x_P^* - \underline{w}, \overline{w} - x_P^*\}$.

In any PBE, for $r^*(z)$ to be the optimal strategy for S, it must be the case that for any two z' and z'', the following incentive constraints hold:[24]

$$(2a) \quad -|y(m^*(r^*(z')); z') - x_S^*| - \kappa r^*(z') \geq -|y(m^*(r^*(z'')); z') - x_S^*| - \kappa r^*(z'');$$
$$(2b) \quad -|y(m^*(r^*(z'')); z'') - x_S^*| - \kappa r^*(z'') \geq -|y(m^*(r^*(z')); z'') - x_S^*| - \kappa r^*(z').$$

That is, given S's equilibrium monitoring strategy $m^*(\rho)$, S must (weakly) prefer the action prescribed by $r^*(z)$ for the value of z chosen by B to the action prescribed by $r^*(z)$ for any other value of z. It immediately follows that if $m^*(r^*(z')) = m^*(r^*(z'')) = M$, which implies that $y(m^*(r^*(z')); z') = y(m^*(r^*(z'')); z'') = x_P^*$, we must have $r^*(z') = r^*(z'')$. That is, since S only can take two possible actions, M or D, there can be at most one positive level of protest in equilibrium. S will of course choose $\rho = 0$ if $z \in CI$. Thus, he will only protest if he prefers x_P^* to z *and* it is not too costly to induce S to monitor (i.e., the requisite ρ does not exceed $\rho_0^{Max}(z)$). If there is more than one level of ρ for which $m^*(r^*(z)) = M$, the lowest such ρ is of course the preferred alternative as it achieves the desired result at the least cost. Thus, the only possible semi-separating equilibrium in the sub-game between S and P is one with some types pooling at $\rho = 0$ and the rest pooling at some $\widehat{\rho} > 0$. For ease of future reference, this is stated as Result 2:

Result 2:

If a strictly positive level of protests exists, it is unique. Hence,so is any semi-separating equilibrium in the sub-game between S and P.

When $x_S^* = x_P^*$, it is in fact fairly easy to derive the actual value of $\widehat{\rho}$. I will do this with the aid of figure 4.[25]

[24] Banks (1991), page 18. Since I focus on pure-strategy equilibria, there is no uncertainty about the relation between ρ and y.

[25] Note that $\rho_0^{Max}(x_P^* - c) = \rho_0^{Max}(x_P^* + c)$ only when $x_S^* = x_P^*$.

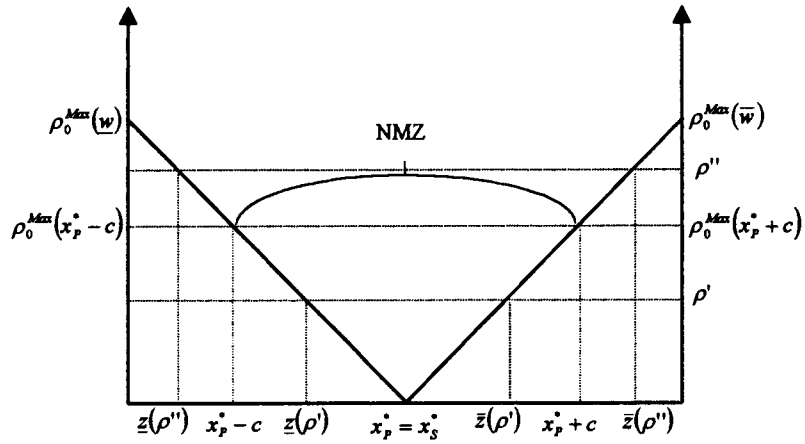

Figure 4: the principle of accomodation

The important question is whether $\widehat{\rho}$ can take values like $\rho'' > \rho_0^{Max}(x_P^* + c)$ or $\rho' < \rho_0^{Max}(x_P^* + c)$. In both cases, the answer turns out to be no. The values of z for which S is willing to play ρ'' if this act induces S to monitor are $[\underline{w}, \underline{z}(\rho'')) \cup (\overline{z}(\rho''), \overline{w}]$. That is, $\rho'' \leq \rho_0^{Max}(z)\ \forall z \in [\underline{w}, \underline{z}(\rho'')) \cup (\overline{z}(\rho''), \overline{w}]$. Since none of these lie strictly inside NMZ, it is at least weakly optimal for S to monitor if he observes ρ''. However, the same can be said of all $\rho_0^{Max}(x_P^* + c) < \rho \leq \rho''$. Therefore, it is reasonable to require $m^*(\rho) = M$ $\forall \rho \in \left[\rho_0^{Max}(x_P^* + c), \rho''\right]$. As ρ'' is arbitrary, the same argument can be extended to all $\rho > \rho_0^{Max}(x_P^* + c)$.[26] Since we know that S will choose the lowest of these, it follows that $\widehat{\rho} \leq \rho_0^{Max}(x_P^* + c)$.

Is ρ' a reasonable candidate then? If $\widehat{\rho} = \rho'$, then all bureaucrats with ideal points in $[\underline{w}, \underline{z}(\rho')) \cup (\overline{z}(\rho'), \overline{w}]$ will be caught deviating if they choose $z = x_B^*$: S will organise protests and P will monitor. Thus, S will have the worst possible policy outcome - $y = x_P^*$ - and he has to pay the "fine" ϕ. Clearly this is dominated by "compromising", i.e., choosing a value of z such that $r^*(z) = 0$ is optimal. This is the *Principle of accommodation.* It would seem that the principle requires bureaucrats for which $x_B^* \notin [\underline{z}(\rho'), \overline{z}(\rho')]$ to move to $\underline{z}(\rho')$ or $\overline{z}(\rho')$. However, on closer inspection, that much accommodation is not necessary. The *Principle of accommodation* and UD in combination yields the prediction $\widehat{\rho} = \rho_0^{Max}(x_P^* + c)$.

Consider a deviation to some $\rho < \rho'$. Given the postulated equilibrium, this is an out-of-equilibrium message. The concept of UD requires P to believe that a deviation from the equilibrium is made at the values of z for which S has the

[26] What P should believe upon observing $\rho > Max\{\rho_0^{Max}(\underline{w}), \rho_0^{Max}(\overline{w})\}$ is not readily apparant. What is obvious, however, is that this is of no consequence for the equilibrium, so I proceed as if the strategy space of S is $[0, Max\{\rho_0^{Max}(\underline{w}), \rho_0^{Max}(\overline{w})\}]$. A similar short-cut is made in the next section.

most to gain from such a deviation. In other words, he should believe that a deviation is made at the values of z for which S requires the least "positive" response from him in order to make such a deviation. Because we are looking for an equilibrium in which S protests only if his preferences over z and x_P^* coincide with those of P, a positive response implies that P monitors. The values of z for which S is most likely to make a specific deviation is thus those for which he requires the least probability of P choosing to monitor after observing his deviation. It can be shown (see the appendix) that the critical values for z are the cut-off points separating the regions in which the strongman does protest from those where he chooses not to. Intuitively, these are the values of z which are furthest from his ideal point (in equilibrium), because B, if necessary, adapts to his credible "threat" of protesting by moving to points where S is exactly indifferent between protesting or not. Therefore, it is in these cases that he has the most to gain from deviating. As a positive level of protest will not be observed along the equilibrium path, to be part of S' equilibrium strategy, it must be the case that if such a level of protest was observed by P, he should entertain beliefs which induces him to monitor. This condition is not satisfied for $\rho < \rho'$. In the postulated equilibrium, S has the greatest incentive to deviate at $\underline{z}(\rho')$ and $\overline{z}(\rho')$. These both lie strictly within the NMZ. Thus, the optimal response of P to $\rho < \rho'$ is D. This would make S stick to the equilibrium. But since ρ' is arbitrary, we can repeat this argument until $\widehat{\rho} = \rho_0^{Max}(x_P^* + c)$. Then $\underline{z}(\rho') = x_P^* - c$ and $\overline{z}(\rho') = x_P^* + c$. In other words, the set of z for which it is optimal for S to keep quiet in equilibrium coincides with NMZ. The signalling strategy of S is therefore *completely informative* in the following sense: upon observing his signal, S is able to make the same decision as he would have made if he had known the location of z for sure. Note well that this results even though S does not care about the monitoring costs that S incurs. In other words, S acts like an agent with incentives to notify his principal of policy deviations but not of whether these deviations are so large as to warrant the expenditure of c. Still, because of the incentives that the real agent of P, B, has, the actions of S and B in combination enable P to take a "fully informed" decision.

5.2 The Case of $x_S^* > x_P^*$

When $x_S^* > x_P^*$, in general completely informative signalling is no longer possible.[27] Now CI is non-empty, and therefore there are values of z such that S wants to keep P out of the game. Since here he is assumed to be able to do so by choosing $\rho = 0$, the fire alarm will not sound in some cases where P would have been better off by intervening. Assume for the moment that there exist positive levels of complaints such that P's optimal choice is to monitor. Continue to denote the lowest such ρ by $\widehat{\rho}$. If there are other levels of ρ for which $m^*(\rho) = M$, they are (at least weakly) dominated by $\widehat{\rho}$, so S will choose

[27] However, see the remark following Proposition 1 and the comments below on what would happen if P knew x_B^*.

the latter in equilibrium. I will now analyse the interaction between B and S before returning to that between S and P.

We know that S has a dominant strategy when his interests coincide with those of B, namely, "make no fuss". But what will he do when his interests are aligned with P's? By assumption, S gets x_P^* if he plays $\widehat{\rho}$. He will hence choose this level of protest if he prefers x_P^* to z and it does not exceed his maximum willingness to pay for his most preferred policy outcome. Since this is also the lowest level of ρ for which P will monitor, he will elect not to protest if he prefers x_P^* to z but cannot "afford" it. Therefore the equilibrium strategy of S is[28]

$$(3) r_0^*(z) = \begin{cases} \widehat{\rho}, z \in [\underline{w}, \underline{z}(\widehat{\rho})) \cup (\overline{z}(\widehat{\rho}), \overline{w}]; \\ 0, z \in [\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho})]. \end{cases}$$

Let us now investigate B's strategic problem. When his ideal point lies in the interval for which the equilibrium strategy of S is not to complain, he can set z equal to it without having to fear that his career will be hurt by either his deviation in implementation or the protests of S. If his ideal point lies outside of this interval, however, he will have to compromise. Should he choose it in this situation, S will organise protests and P will monitor, so B will both see his efforts at changing y from x_P^* to x_B^* nullified and incur the "punishment" ϕ. Clearly this is dominated by compromising. If B's ideal point lies in $[\underline{w}, \underline{z}(\widehat{\rho}))$, the greatest possible compromise he will have to make in order to persuade S not to protest is setting $z = \underline{z}(\widehat{\rho})$. Then the policy outcome is at worst marginally better for B than it would have been if S did protest.[29]

In addition, B avoids ϕ. Likewise, for $x_B^* \in (\overline{z}(\widehat{\rho}), \overline{w}]$, the greatest possible compromise required is $\overline{z}(\widehat{\rho})$. Again, this policy outcome is better than when S does protest and B's career remains unscathed. It follows that B's equilibrium strategy is[30]

$$(4) \varsigma_0^*(x_B^*) = \begin{cases} \underline{z}(\widehat{\rho}), x_B^* \in [\underline{w}, \underline{z}(\widehat{\rho})); \\ x_B^*, x_B^* \in [\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho})]; \\ \overline{z}(\widehat{\rho}), x_B^* \in (\overline{z}(\widehat{\rho}), \overline{w}]. \end{cases}$$

From (4) it follows that there will never be any protests in equilibrium, so P will never have the opportunity to decide whether to monitor or not. Of course, this does not mean that we can ignore P. After all, S only has a credible threat if P is willing to monitor for some levels of z which S would be willing to choose in order to attract P's attention. In other words, we must show under what

[28] I resolve the indifference of S at $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ by assuming that he does not protest. Of course, nothing of substance will change if it is assumed that S chooses $\widehat{\rho}$ when he is indifferent between this action and $\rho = 0$. $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ are defined formally in the appendix.

[29] Remember that we assume that $\widehat{\rho} > 0$ exists, so $\underline{z}(\widehat{\rho}) < x_P^*$ and $\overline{z}(\widehat{\rho}) > 2x_S^* - x_P^*$ always, even if only marginally so.

[30] Strictly speaking, B's equilibrium strategy is one of these three alternatives depending on the location of his ideal point.

conditions, if any, $\widehat{\rho}$ exists. To do so, we must investigate P's beliefs upon seeing various protests.

Denote P's density function over the position of z after observing ρ by $h^*(z|\rho)$. The equilibrium concept utilised here requires P to use Bayes' Rule and the equilibrium strategy of to form his opinion about the location of . Since in equilibrium P is not brought into play, his beliefs following $\rho = 0$ are immaterial. This means that in equilibrium, he can have any posterior belief about the distribution of that satisfies the minimal constraint that the probabilities sum to one, i.e., any probability distribution where $h^*(z|0) \in [0,1]\ \forall z$ is permissible as long as $H^*(\overline{w}|0) = \int_{\underline{w}}^{\overline{w}} h^*(z|0)\,dz = 1$. Arbitrarily, I fix it such that $m^*(0) = D$ is "optimal". We might then describe the equilibrium strategy of P in the following rather general terms:[31]

$$(5) m_0^*(\rho) = \begin{cases} M \text{ if } E_{h^*(z|\widehat{\rho})}[u_P(z)] \leq -c; \\ D \text{ otherwise.} \end{cases}$$

That is, if the utility from monitoring, which is just minus the monitoring costs, exceeds the expected utility of not monitoring, where the expectation is based on $h^*(z|\rho)$, it is optimal for P to monitor. Otherwise, it is not.

Existence can be proved by establishing upper bounds on $\widehat{\rho}$, or equivalently, c. Of course, if monitoring costs a prohibitive, P would never monitor. Thus, an equilibrium for the whole game with a semi-separating equilibrium in the sub-game involving S and P can only exist for $0 < c < \widetilde{c}$. Existence is then ensured by picking a $\overline{c} \leq \widetilde{c}$, such that for all $0 < c < \overline{c}$, there exists ρ for which $m_0^*(\rho) = M$ regardless of $h^*(z|\rho)$.

Here, I demonstrate how this is done by way of two figures.[32]

Figure 5 illustrates a "two-sided" equilibrium, which exists for certain parameter values. I call it a two-sided equilibrium because in it S is willing to protest for both some $z < x_P^*$ *and* some $z > x_P^*$. As already noted, completely informative signalling is in general not possible when $x_S^* \neq x_P^*$. That is, we cannot have $\underline{z}(\widehat{\rho}) = x_P^* - c$ and $\overline{z}(\widehat{\rho}) = x_P^* + c$. Secondly, we cannot have $\underline{z}(\widehat{\rho}) > x_P^* - c$ and $\overline{z}(\widehat{\rho}) < x_P^* + c$; both $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ cannot lie in NMZ as this would make it optimal for P to choose D upon observing the postulated $\widehat{\rho}$. Thirdly, $x_S^* > x_P^*$ implies $\rho_0^{Max}(x_P^* - c) > \rho_0^{Max}(x_P^* + c)$. Since in equilibrium S will choose the least costly way of signalling, we are looking for two-sided equilibria in which $\underline{z}(\widehat{\rho}) > x_P^* - c$ and $\overline{z}(\widehat{\rho}) > x_P^* + c$; i.e., $\widehat{\rho} > \rho_0^*(x_P^* + c)$. But because $\widehat{\rho}$ as a function of c cannot be explicitly derived, an upper bound $\rho_0^{Max}(x_P^* - c)$ is all that can be established. A sufficient condition for the upper bound on $\widehat{\rho}$ to exist, is $0 < c < \overline{c} = x_P^* - \underline{w}$.

In a "one-sided" equilibrium, S only protests for some $z < x_P^*$ (given the assumption $x_S^* > x_P^*$). A one-sided equilibrium might exist under two kinds of circumstances. Either $2x_S^* - x_P^* > \overline{w}$, so that S strictly prefers all $z > x_P^*$ to x_P^*;

[31] The manner in which indifference is resolved does not affect the results qualitatively.

[32] In connection with the analysis in the next section, I do this formally (see the appendix).

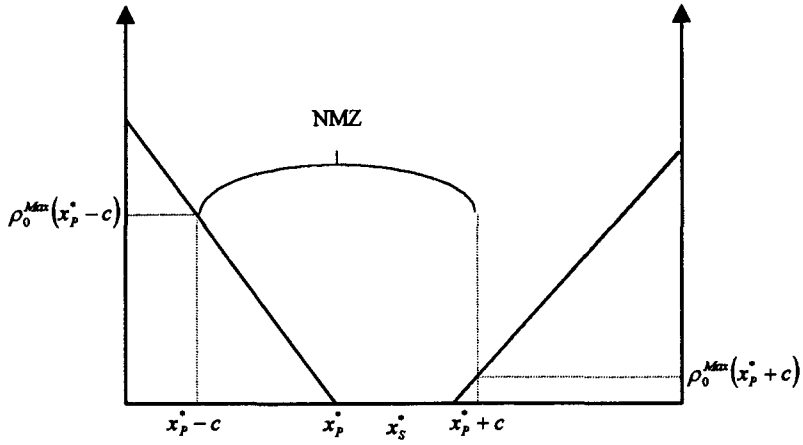

Figure 5: example of two-sided equilibrium

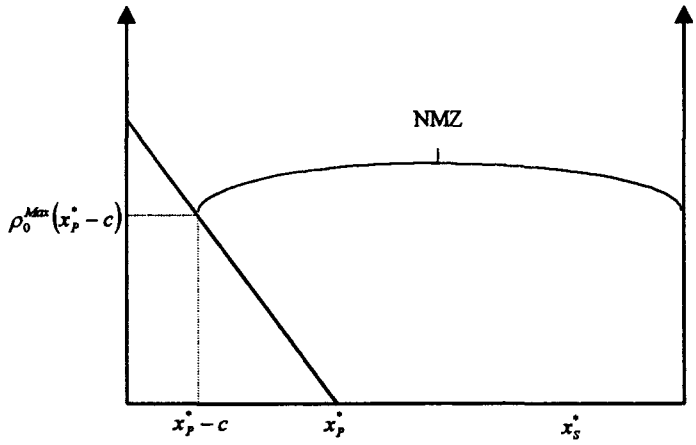

Figure 6: example of one-sided equilibrium

or $c > \overline{w}$, so that even observing $\rho_0^{Max}(\overline{w})$ does not guarantee that P optimally should choose M ($\overline{w}$ lies strictly within NMZ). The latter case, which is due to very high monitoring costs, can be envisaged from figure 5. The former case, in which the cause is the extreme policy preferences of S (or, equivalently, a great divergence between the ideal policies of S and P), is illustrated in figure 6. In both cases, given the assumption $x_S^* > x_P^*$, the upper bound on $\widehat{\rho}$ is $\rho_0^{Max}(x_P^* - c)$.[33]

These results are summarised in Proposition 1:[34]

Proposition 1:

$0 < c < \overline{c}$, where $\overline{c}$ is a function of x_P^*, x_S^*, $\underline{w}$, and $\overline{w}$ is a sufficient condition for the equilibrium described by (3), (4), *and* (5) *to exist.*

A interesting corollary to this proposition is that if B is a perfect Weberian bureaucrat, i.e., if $x_B^* = x_P^*$, B can fulfil both of the tasks laid on him by his superior to perfection: the policy is implemented as planned and there are no politically harmful effects from social unrest. The reason is that $r_0^*(x_P^*) = 0$; S will not expend costly resources that cannot possibly make any difference to the policy outcome.

Corollary 1:

A Weberian bureaucrat will set $z = x_P^*$ and thereby avoid protests by S.

It also follows from Proposition 1 that under the condition specified, there is an implementation gap as long as B is not a Weberian bureaucrat:

Corollary 2:

There is an implementation gap for $x_B^* \neq x_P^*$. For a given c, the implementation gap is increasing in x_B^* for $x_B^* \in [\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho})] \supset CI$. It is constant at $x_P^* - \underline{z}(\widehat{\rho})$ or $\overline{z}(\widehat{\rho}) - x_P^*$ for $x_B^* \notin [\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho})]$, with $\overline{z}(\widehat{\rho}) - x_P^*$ being the maximum size of the gap.

Remark:

One-sided equilibria are completely informative. This is because either a) the polarisation in preferences between S and P is so great that the former wants to keep the latter out of the game $\forall z > 0$ or b) monitoring costs are so high that $\widehat{\rho}$ is so high as to that S does not want to play it for any $z > x_P^*$. That is, there is either no incentive for S to try to mislead P into monitoring when it is really not worthwhile for P to check or it is too costly to do so.

Note that if P knows x_B^*, because he is P's appointee or P chose him on the recommendation or under the pressure of someone with known policy preferences, he will know z whenever the case is brought to his attention. This is so because if B decides to run the risk of setting off the fire alarm, the optimal deviation is to x_B^*. Therefore, P will take care of the case whenever it is worthwhile for him to do so, i.e., whenever the improvement in the policy outcome exceeds the costs of monitoring. Then the slightest possible noise will be made by S if z is such that P would intervene and S prefers x_P^* to z. So B would have to compromise by going to $x_P^* - c$ or $x_P^* + c$, the values of z which makes

[33] As can be seen from the figures, in both cases the assumption $x_S^* > x_P^*$ dictates that if the existence of a one-sided equilibrium is to be guaranteed we must have $\underline{w} < 2x_P^* - \overline{w}$.

[34] As noted in connection with figure 6, $\overline{z}(\widehat{\rho})$ might not exist, in which case (4) must be adjusted accordingly.

P indifferent between monitoring or not. That is, *completely informative signalling* would be possible. It is not clear that this requires a greater concession from B, because under uncertainty, S can take advantage of the fact that even if z lies within NMZ, the possibility of it lying on the outside might lead P to monitor anyway.[35] However, if c is interpreted as mostly consisting of the costs of checking what has actually transpired, they will be approximately zero if P knows x_B^*, and so he would always intervene if he is allowed to do so. Then B would be forced all the way to x_P^* or $2x_S^* - x_P^*$.

To complete the description of possible equilibria, Proposition 2 states the sufficient condition for the existence of an equilibrium with pooling in the subgame between S and P. Intuitively, for very high monitoring costs, P would not intervene even if S protested B's choice strongly. Thus, there is no reason for B to heed the *Principle of accommodation.*

Proposition 2:

$c \geq \widetilde{c}$ is sufficient for the following equilibrium to exist: i) $\varsigma_0^*(x_B^*) = x_B^* \; \forall x_B^*$; ii) $r_0^*(z) = 0 \; \forall z$; iii) $m_0^*(\rho) = D \; \forall \rho$.

The assumption that playing $\rho = 0$ precludes P from participating in the game is an important difference between the model explored in this section and those of both Lupia and McCubbins (1994b) and Epstein and O'Halloran (1995). These authors depict the FA as a party regularly participating in hearings on policies (most likely because of their focus on institutional implications). For example, the FA in the model of Lupia and McCubbins has to make a stand and could wish to mislead the politician about which outcome it prefers, but it might be dissuaded from dissembling by costs incurred if it is caught lying. Here, the FA can make statements simply because it is an important political actor with an interest in the policy. However, it does not have to, and so might refrain from taking action if it is not worthwhile. Therefore, the private FA involved here, S, might collude with the bureaucrat, but it will never dissemble in the sense of sounding the alarm when it is not the case that $z \neq x_P^*$. This changes in the next section.

6 The Sounds of Silence

In the absence of further justification, the assumption that P is not allowed to participate in the game if S does not protest is clearly untenable. Within the confines of the present model, good reasons for restricting P in this way are hard to find. Hence, we should investigate what P's optimal response to no protest is. This turns out to be a non-trivial task.

This is best illustrated by starting out with the case of $x_S^* = x_P^*$. If $c = 0$, then clearly $m^*(\rho) = M \; \forall \rho$. The subtle change from the last section is that $m^*(0) = M$ now has real substance. As long as the policy ideals of S and P coincide, however, this does not change the outcome. All types of bureaucrats will heed the *Principle of accommodation* and x_P^* is always the policy outcome.

[35] As noted above, in a two-sided equilibrium $\underline{z}(\widehat{\rho}) > x_P^* - c$ and $\overline{z}(\widehat{\rho}) > x_P^* + c$. Hence, bureaucrats for which $x_B^* < \underline{z}(\widehat{\rho})$ would actually gain from P knowing their ideal points.

Positive costs of monitoring does not change the results of the last section either. When $x_S^* = x_P^*$, S had no reason to use the added power of $\rho = 0$ assumed there; by extension, here he has no incentive to try to mislead P about whether a deviation has been made by B or not. Of course, he still might want to fool P into intervening when it is not worthwhile for him to do so. However, the combination of the *Principle of accommodation* and UD implies that the outcome is *completely informative signalling.*

The results start to change compared to the last section when $x_S^* > x_P^*$. First of all, assuming $c = 0$, the power of S is decreased and the power of P increased when the latter might intervene following $\rho = 0$. The optimal strategy of P is still $m^*(\rho) = M \ \forall \rho$, but now $m^*(0) = M$ implies that the outcome will be x_P^*. All types of bureaucrats will adapt to P's strategy by choosing $z = x_P^*$. This contrasts with the last section, when S could keep P out of the game and would do so if $z \in CI$. Then all bureaucrats for which $x_B^* \in CI$ could choose $z = x_B^*$ without having to fear for their careers. Thus, to the extent that such bureaucrats are possible, the outcome improves for P.

When $c > 0$ but "small", things change markedly in that there is now no pure-strategy equilibrium. The reason is simple. When $c \approx 0$, P should "almost" always check what has happened in B's district. Once again, this obviates any incentives S might have for protesting B's choice, and the *Principle of accommodation* still implies that the optimal strategy of B is $\varsigma^*(x_B^*) = x_P^* \ \forall x_B^*$ in this case. However, when it is his turn to move, P should then realise that $z = x_P^*$. Since x_P^* is in the interior of NMZ for all strictly positive c, it thus would not pay for him to intervene. But if P abstains from monitoring, $\varsigma(x_B^*) = x_P^* \ \forall x_B^*$ is clearly not optimal. Hence, if an equilibrium exists for low monitoring costs, it must be one in which some of the players use mixed strategies. An analysis of such an equilibrium is beyond the scope of the present paper. I would only like to point out that the incentives S has to protest are a non-monotonous function of z, c.f. the "see-saw" pattern of $\rho^{Max}(z)$ in figure 7. This indicates that the characterisation of optimal mixed strategies is likely to be difficult (and proving existence even more so).

In the remainder of this section, I discuss the pure-strategy equilibria that exist for ρ not "too" small and not "too" high. These involve the same kind of semi-separating equilibrium in the sub-game between S and P as those described in the last section. Existence is proved in two steps. Firstly, sufficient conditions on the level of c are established. Secondly, I prove that the following necessary conditions are satisfied then. The *Principle of accommodation* implies that a positive level of protest will not be observed along the equilibrium path. To be part of the equilibrium strategy of S it must first of all be the case that if such a level of protest was observed by P, his rational beliefs imply that the optimal action is to monitor. In addition, S must be willing to play $\widehat{\rho}$, which he could be at the cut-off points because these are by construction points for which S is indifferent between staying on the equilibrium path by not protesting and staging the equilibrium level of positive protest. Secondly, any deviations from the unique equilibrium level of positive protest or zero should result in rational beliefs by P that makes him respond in a way that supports the equilibrium.

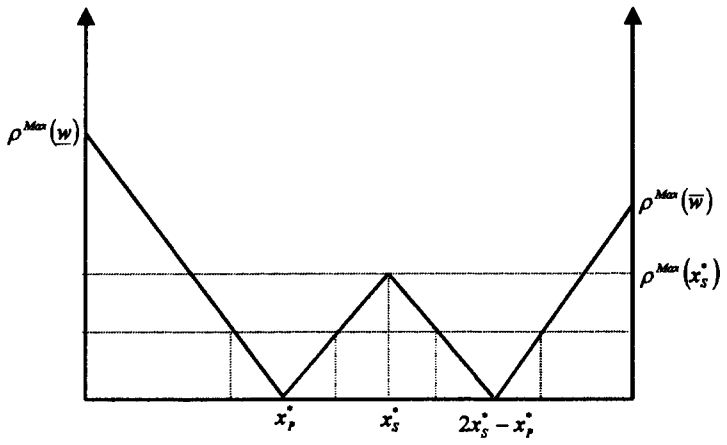

Figure 7: $\rho^{Max}(z)$

Thirdly, of course, along the equilibrium path, P should choose not to monitor. These conditions are stated formally in the appendix, where existence is proved.

Hence, under certain condition it is possible to extend the results of the last section to the case where the response of P to $\rho = 0$ is endogenous. That is, for certain values of c, there exist equilibria in which some types of bureaucrats heed the *Principle of accommodation.* This they do because for a range of values of z, S can credibly threaten to protest, where credibly means that it would indeed be optimal for P to intervene upon observing a certain positive level of protest and that incurring the cost required to induce P to monitor is optimal for S.

Finally, prohibitive monitoring costs are sufficient to guarantee that P will never intervene. Therefore, S will not protest no matter the choice of z. Then B can implement his ideal policy regardless of what that is.

7 Concluding Comments

In this paper, I have investigated a possible source of the widely observed discrepancies between planned and implemented policies in low-income countries. We have seen that bureaucrats might collude with local or regional political powers so that actual policy is different from what the bureaucrats' superiors intended. This can only happen when the policy preferences of the bureaucrats are not the same as those of their principals. However, this is probably not uncommon. Politicised hiring of government officials is widespread in the countries that make up the so-called Third World. If the bureaucrats have been hired by their superiors, the latter have probably taken this into account and chosen non-Weberian employees either because of the prodding of powerful persons or because they gained in other ways. Giving someone a job in the bureaucracy on

a person's request might create obligations on the part of both the requester and the individual who is employed. This obligation can be put to use later by the person controlling the hiring decision. Thus, it seems important to study how such reciprocities affect governmental output. We have noted that P knowing x_B^* does not necessarily force greater concessions from B because S might have been able to utilise P's uncertainty strategically. In addition, when new principals arrive, they inherit non-Weberian bureaucrats and will face the situation studied in most of this paper, where x_B^* was assumed unknown to P.

One way to go from here is to investigate the issues discussed in the context of specific policies. Land reform comes readily to mind, particularly since large landowners definitely are "strongmen" in many poor countries. Another avenue one could take to study these matters in more depth is to generalise the model, for example, by allowing the principal to choose the policy with an eye to the ensuing game. As mentioned above, one should then preferably include more than one bureaucrat interacting with one strongman.

One of the motivations of the field officials as presented here is the need to avoid controversy over implementation decisions. It is argued that this need stems from the bureaucratic principals' aversion to such controversy, an aversion which in turn is founded on the fragility of political regimes and careers in poor countries. A more complete analysis would seek to include these effects. However, as the most plausible arguments for the politicians' desire to avoid social unrest rely on incomplete information, it is not a task easily done. It would also require the behaviour of more agents to be modelled, in itself a complicating factor. Though, it could be done in a very stylised fashion by considering a two-period version of the above game where there is only a probability q of the principal being in charge in the second period as well, with $q = q(\rho)$, $q'(\rho) < 0$. Moreover, this could create incentives for action for S which are different from the ones that we have sought to highlight here. For instance, he might create controversy in the hope that the next principal's preferences will be more agreeable to him.

The choice of bureaucratic control structures should be studied from a normative perspective, using the principal-agent methodology.[36] In a previous version of the paper, I studied the effects of low-level auditing, i.e., the possibility of officials below P in the hierarchy discovering and rectifying transgressions by B. This was done assuming that S could keep P out of the game by choosing $\rho = 0$, but that an imperfect audit was conducted regardless of the choice made by S. The general conclusion was that FA and PP features of an oversight system have the potential for reinforcing each other, since auditing implies that deviations by B can be detected even if S played $\rho = 0$. However, it was interesting to see that for some implementation choices by B, auditing attenuated the incentives that S has to protest strongly. This was due to assuming that the probability of an audit was higher if protests occurred (but lower than 1 so that auditing was always imperfect) . Since making the tiniest noise possible set off this mechanism, i.e., this alternative was approximately costless, S could

[36] For some thoughts on this subject, see Tirole (1994).

be content with this increase in the probability of getting x_P^*. Then B could possibly get away with less accommodation, i.e., greater deviations. Hence, the details of the oversight system might be important to the outcomes.

An important point for institutional design is that a Weberian bureaucracy is a "collective good" for political principals, be they current or future. As such, it will tend to be undersupplied. The political instability of most low-income countries aggravate this feature. Creating a new control structure requires time and monetary resources to be spent on designing and building it. When the time horizon of principals is short due to political turbulence, such an investment is not likely to be profitable.[37] While this is in a sense pessimistic conclusion because all countries could do with efficient bureaucracies, it is perhaps not as stark when one remembers that an efficient bureaucracy need not pursue normatively desirable goals. Alas, it seems that the objectives of many politicians in poor countries do not make for the purposeful pursuit on the part of bureaucrats of a notion of the common good. Thus, a deviating bureaucrat might be a true public servant.

8 Appendix

This appendix contains the proofs of the results for the case where P's response to the silence of S is endogenous. Here I assume $x_S^* > x_P^*$. I first define $\rho^{Max}(z)$, $\underline{z}(\rho)$, and $\overline{z}(\rho)$. Secondly, I define a Universally Divine Equilibrium (UDE) in the present context. Thereafter, I derive $\beta(\rho, z)$, the probability of monitoring by P which makes S indifferent between staying with the equilibrium and playing ρ for a given value of z. Fourthly, I demonstrate that the critical values of are extreme points in the sense of being the endpoints of the various equilibrium intervals for which S plays $\widehat{\rho}$ or zero. Having established this, I state the equilibria existing under different parameter configurations. Where the results are not immediate, the requisite proofs follow.

$\rho^{Max}(z)$ is defined by the identities

$$\begin{aligned}(C1a) - |x_P^* - x_S^*| - \kappa\rho^{Max}(z) &\equiv -|z - x_S^*|, z \in [\underline{w}, x_P^*) \cup (2x_S^* - x_P^*, \overline{w}]; \\ (C1b) - |x_P^* - x_S^*| &\equiv -|z - x_S^*| - \kappa\rho^{Max}(z), z \in [x_P^*, 2x_S^* - x_P^*].\end{aligned}$$

That is, $\rho^{Max}(z)$ is the maximum protest that S would be willing to stage, given z, in order to get his most preferred policy outcome, x_P^* (C1a) or z (C1b). Thus,

$$(C2)\rho^{Max}(z) = \begin{cases} \frac{|z - x_S^*| - |x_P^* - x_S^*|}{\kappa}, z \in [\underline{w}, x_P^*) \cup (2x_S^* - x_P^*, \overline{w}]; \\ \frac{|x_P^* - x_S^*| - |z - x_S^*|}{\kappa}, z \in [x_P^*, 2x_S^* - x_P^*]. \end{cases}$$

$\underline{z}(\rho)$ and $\overline{z}(\rho)$ are inverse functions of $\rho_0^{Max}(z)$. Since we are looking for an equilibrium in which S chooses $\rho = 0$ for $z \in CI = [x_P^*, 2x_S^* - x_P^*]$, $\underline{z}(\rho) \leq x_P^*$

[37] For a more thorough analysis of this problem, see Hagen (1999).

and $\overline{z}(\rho) \geq 2x_S^* - x_P^*$. That is, $\underline{z}(\rho)$ is defined by $\rho = \rho^{Max}(\underline{z})$ for $z \in [\underline{w}, x_P^*]$ and $\overline{z}(\rho)$ is defined by $\rho = \rho^{Max}(\overline{z})$ for $z \in [2x_S^* - x_P^*, \overline{w}]$. Hence,

$$(C3a)\underline{z}(\rho) = \rho^{Max-1}(\underline{z}) = x_P^* - \kappa\rho, \rho \in \left[0, \rho^{Max}(\underline{w})\right];$$
$$(C3b)\overline{z}(\rho) = \rho^{Max-1}(\overline{z}) = 2x_S^* - x_P^* + \kappa\rho, \rho \in \left[0, \rho^{Max}(\overline{w})\right].$$

That is, $\underline{z}(\rho)$ is the highest level of z in $[\underline{w}, x_P^*]$ for which ρ is not dominated by $\rho = 0$ and $\overline{z}(\rho)$ is the lowest level of z in $[2x_S^* - x_P^*, \overline{w}]$ for which ρ is not a dominated strategy.

To facilitate the discussion, a formal definition of the equilibrium concept is included here:

Definition C1:

A pure strategy universally divine equilibrium consists of strategies and beliefs satisfying i) $\varsigma^*(x_B^*) \in \arg\max_z V_B(z; r^*(z), m^*(\rho))$*; ii)* $r^*(z) \in \arg\max_\rho V_S(\rho; z, m^*(\rho))$*; iii)* $m^*(\rho) \in \arg\max_a E_{h^*(z|\rho)}[V_P(a; \varsigma^*(x_B^*), \rho)]$*; iv) if* $\int_{\{z|r^*(z)=\rho\}} g(z)\,dz > 0$*, then* $h^*(z|\rho) = \frac{g(z)}{\int_{\{z|r^*(z)=\rho\}} g(z)dz}$*; v) if* $\int_{\{z|r^*(z)=\rho\}} g(z)\,dz > 0$*, then* $h^*(z|\rho) > 0$ only if $z \in \arg\min_t \beta(\rho, t)$.

Here $V_i(\cdot)$ is the complete objective function of player i, e.g., $V_S(\rho; z, m^*(\rho)) = -|y(m^*(\rho); z) - x_S^*| - \kappa\rho$. $g(z) = \int_{\{x_B^*|\varsigma^*(x_B^*)=z\}} f(x_B^*)\,dx_B^*$, i.e., it is the beliefs of P over the location of z induced by $\varsigma^*(x_B^*)$ *before* he observes ρ. Upon observing ρ, he updates his beliefs to $h^*(z|\rho)$ using $r^*(z)$ and Bayes' Rule whenever possible. If he observes an out-of-equilibrium message, he uses UD to update his beliefs. This implies that he believes that the deviation is made by S for the values of z at which S requires the least probability of P responding with M.

In the type of equilibrium we are looking for, S can keep quiet when $z \in CI$ without P monitoring. It is obvious that he will not deviate by playing a positive ρ for these values of z. Hence, we only have to check his incentives to deviate from the posited equilibrium when he has the same preferences over z and x_P^* as do P. Also, we do not have to worry about deviations to some ρ higher than $\widehat{\rho}$. The only deviations that might threaten a candidate equilibrium where S is to play $\widehat{\rho}$ for certain values of z are $\rho \in (0, \widehat{\rho})$. $\beta(\rho, z)$ is defined by the identity

$$(C4)\beta(\rho, z)|x_P^* - x_S^*| + [1 - \beta(\rho, z)]|z - x_S^*| + \kappa\rho \equiv |x_P^* - x_S^*| + \kappa\widehat{\rho}.$$

Rearranging, we have

$$(C5)\beta(\rho, z) = 1 + \frac{\kappa(\widehat{\rho} - \rho)}{|x_P^* - x_S^*| - |z - x_S^*|}.$$

Because we only look at deviations downwards (and $\kappa > 0$), the numerator of the fraction on the right hand side is positive. The denominator is well-defined since here we assume that $c > 0$. Hence the potential cut-off points are

different from x_P^*. The denominator is negative because the types of S which might deviate are those which prefer x_P^* to z. Thus, $\beta(\rho, z)$ is less than one. It is positive, however, because $\widehat{\rho}$ will be some $\rho_0^{Max}(z)$, so that the expression could be reduced to $\beta(\rho, z) = \frac{-\kappa\rho}{|x_P^* - x_S^*| - |z - x_S^*|} > 0$. Furthermore,

$$\begin{aligned}
(C6a)z \quad &< \quad x_S^* \Longleftrightarrow \beta(\rho, z) = 1 + \frac{\kappa(\widehat{\rho} - \rho)}{z - x_P^*}; \\
\frac{\partial \beta(\rho, z)}{\partial z} \quad &= \quad -\frac{\kappa(\widehat{\rho} - \rho)}{(z - x_P^*)^2} < 0; \\
(C6b)z \quad &\geq \quad x_S^* \Longleftrightarrow \beta(\rho, z) = 1 + \frac{\kappa(\widehat{\rho} - \rho)}{2x_S^* - x_P^* - z}; \\
\frac{\partial \beta(\rho, z)}{\partial z} \quad &= \quad \frac{\kappa(\widehat{\rho} - \rho)}{(2x_S^* - x_P^* - z)^2} > 0.
\end{aligned}$$

As shown below, there are either one or two cut-off points. If there are two, one will be above and one will be below. Since we are looking for the values of z for which S needs the least inducement to deviate, we are interested in the values of B's implementation choice which minimise $\beta(\rho, z)$. The derivatives show that below x_S^*, the probability of monitoring which makes S indifferent between staying with the equilibrium or deviating to ρ is minimised for the z closest to x_S^*, regardless of the value of ρ. This is the lower cut-off point. Equivalently, above x_S^*, S needs the least incentive to deviate when z equals the higher cut-off point. These results are intuitive in the sense that the equilibrium we are searching for will be such that S will be indifferent between playing $\rho = 0$ or $\widehat{\rho}$ at the cut-off points. For values of z below the lowest and above the highest cut-off point, he would have been willing to stage even larger protests and hence in a sense achieves an "information rent" by pooling on $\widehat{\rho}$. For the remaining zs outside CI, he ideally would have liked P to monitor, but since these lie closer to his ideal point than does the cut-off points, the urge to deviate is less strong. And, as noted above, for zs in CI, he has the best of all possible worlds in the type of equilibrium we are trying to establish.

Because B anticipates what will transpire between S and P, we know that $\widehat{\rho}$ will not be observed along the equilibrium path. What B does, if we stick to the signalling game terminology, is to shrink the type space of S. But while a positive level of protest is not observed along the equilibrium path, to be part of the equilibrium strategy of S, and thereby inducing some types of B to accommodate him, it must be the case that P, taking into account the strategies of B and S, will in fact monitor upon observing $\widehat{\rho}$. Thus, we must treat $\widehat{\rho}$ as a deviation from the equilibrium path and make sure that it is optimal for P to monitor if it is played.

This point can be seen more clearly by deriving P's probability distribution over z prior to observing ρ. As noted above, $g(t) \equiv prob(z = t; \varsigma^*(x_B^*), f(x_B^*))$, i.e., $g(t)$ is the probability that z is equal to t given the equilibrium strategy of B and the probability distribution over his ideal points. Because B's optimal

strategy is never to choose a z which would make S stage a positive level of protest, the probability of observing $\widehat{\rho}$ is zero in the equilibrium of the full game: $\int_{\{z|r^*(z)=\widehat{\rho}\}} g(z)\,dz = 0 \quad \int_{\{z|r^*(z)=\widehat{\rho}\}} dz = 0$. Hence, along the equilibrium path the posterior probability distribution over the location of z cannot be derived using Bayes' Rule and the strategy of S.

To summarise, "climbing up" the game tree, we postulate that there is (at least) one $\rho > 0$ that would make P monitor. Therefore, S will play it for certain values of z. We then know that certain types of B will adhere to the *Principle of accommodation.* Thus, "climbing down" the game tree again, S will not find it worthwhile to play $\widehat{\rho}$. But in order for this to be an equilibrium, it must be the case that had he played it, the values of z for which he would have done so must be such that P would have monitored. Since B makes S indifferent between playing and zero at the cut-off point(s), the first requirement that $\widehat{\rho}$ has to satisfy is $E_{h^*(z|\widehat{\rho})}[u_P(z)] \leq -c$. Secondly, it must be the case that, for S to stay with $\widehat{\rho}$ instead of choosing a lower and cheaper level of protest, P must respond to such ρs with a probability of monitoring sufficiently low to deter S from deviating. Thirdly, of course, upon observing $\rho = 0$, it must be optimal for P given his rational beliefs to refrain from checking what B has done.

Formally, for the case of two cut-off points, the requirements are

$$
\begin{aligned}
(C7a)c \quad &\leq \quad h^*\left(\underline{z}\left(\widehat{\rho}\right)|\widehat{\rho}\right)\left|\underline{z}\left(\widehat{\rho}\right) - x_P^*\right| + \left[1 - h^*\left(\underline{z}\left(\widehat{\rho}\right)|\widehat{\rho}\right)\right]\left|\overline{z}\left(\widehat{\rho}\right) - x_P^*\right|; \\
(C7b)c \quad &\geq \quad h^*\left(\underline{z}\left(\widehat{\rho}\right)|\rho\right)\left|\underline{z}\left(\widehat{\rho}\right) - x_P^*\right| + \left[1 - h^*\left(\underline{z}\left(\widehat{\rho}\right)|\rho\right)\right]\left|\overline{z}\left(\widehat{\rho}\right) - x_P^*\right|, \rho \in (0,\widehat{\rho}); \\
(C7c)c \quad &\geq \quad h^*\left(\underline{z}\left(\widehat{\rho}\right)|0\right)\left|\underline{z}\left(\widehat{\rho}\right) - x_P^*\right| + \int_{\underline{z}(\widehat{\rho})}^{\overline{z}(\widehat{\rho})} |z - x_P^*|\, h^*(z|0)\,dz + h^*\left(\overline{z}\left(\widehat{\rho}\right)|0\right)\left|\overline{z}\left(\widehat{\rho}\right) - x_P^*\right|.
\end{aligned}
$$

Because the incentives to deviate downwards are greatest at the cut-off points, $h^*\left(\underline{z}\left(\widehat{\rho}\right)|\widehat{\rho}\right) = h^*\left(\underline{z}\left(\widehat{\rho}\right)|\rho\right)\ \forall \rho \in (0,\widehat{\rho})$. Hence, the equilibrium has sort of a knife-edge property: (C7a) and (C7b) will both hold with equality. Thus, P will be indifferent between monitoring or not upon observing $\widehat{\rho}$. This allows him to randomise in a fashion that makes S stay with the equilibrium. Denote the probability that P monitors by $\mu(\rho)$. An equilibrium requirement is thence $\mu^*(\rho) \leq \beta(\rho, z)\ \forall \rho \wedge \forall z$. We can at once set $\mu^*(\rho) = 1\ \forall \rho \geq \widehat{\rho}$ and $\mu^*(0) = 0$ without upsetting an equilibrium of the type that we are looking for, though of course the cut-off points must be such that the latter is in fact optimal. Deviations upward is of no concern since S will choose the least cost way of protesting B's choice and the equilibrium will be such that it is in fact optimal for P to monitor should he observe a ρ larger than $\widehat{\rho}$. Our concern is with deviations to positive levels of protest lower than $\widehat{\rho}$. Inserting the expression for $\underline{z}\left(\widehat{\rho}\right)$ in (C6a) and that for $\overline{z}\left(\widehat{\rho}\right)$ in (C6b), $\beta(\rho, z)$ can be written as

$$
(C8)\beta\left(\rho, \underline{z}\left(\widehat{\rho}\right)\right) = \beta\left(\rho, \overline{z}\left(\widehat{\rho}\right)\right) \equiv \beta(\rho) = \frac{\rho}{\widehat{\rho}}.
$$

It follows that setting $\mu^*(\rho) = \beta(\rho)\ \forall \rho \in (0, \widehat{\rho})$ will generate the right incentives for S. However, so will setting $\mu^*(\rho) = 0\ \forall \rho \in (0, \widehat{\rho})$, and such a choice will not affect the equilibrium. In other words, equilibrium outcomes are isomorphic as long as $\mu^*(\rho) \in \left[0, \frac{\rho}{\widehat{\rho}}\right]\ \forall \rho \in (0, \widehat{\rho})$, and therefore we might as well stay with the pure strategy equilibrium.

In general, it is not possible to solve for $\widehat{\rho}(c)$, the level of ρ which ensures that (C7a-c) are satisfied for a specific value of c. Therefore I confine myself to stating the values of c for which one- and two-sided equilibria surely exist; and to proving that the necessary conditions (C7a-c) are satisfied then. As noted in the main text, c can be neither too small nor too high. That is, it must be below a certain maximum and above a certain minimum level. These bounds cannot be explicitly derived, and I therefore state levels of c sufficient to guarantee an equilibrium of the type we are looking for (denoted by $\overline{c}$ and $\underline{c}$ respectively). Moreover, I split this interval into intervals where one- and two-sided equilibria exist, as applicable.

If $2x_S^* - x_P^* \geq \overline{w}$, $CI = [x_P^*, \overline{w}]$ (since $x_S^* > x_P^*$). Then only a one-sided equilibrium of the type we are looking for can be guaranteed to exist. It is for $z < x_P^*$ that S must be willing to play $\widehat{\rho}$ and P willing to monitor if a semi-separating equilibrium is to exist. Hence, $0 < \underline{c} = \overline{w} - x_P^* < c < x_P^* - \underline{w} = \overline{c}$ is sufficient (and $\underline{w} < 2x_P^* - \overline{w}$ necessary).[38]

In the case $2x_S^* - x_P^* < \overline{w}$, both types of equilibria might exist. Then, $\widetilde{c} = Max\{x_P^* - \underline{w}, \overline{w} - x_P^*\}$. As noted in the main text, completely informative signalling is in general not possible when $x_S^* \neq x_P^*$. That is, we cannot have both $\underline{z}(\widehat{\rho}) = x_P^* - c$ and $\overline{z}(\widehat{\rho}) = x_P^* + c$. Secondly, however, we cannot have $\underline{z}(\widehat{\rho}) > x_P^* - c$ and $\overline{z}(\widehat{\rho}) < x_P^* + c$; $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ cannot both lie in NMZ as this would make it optimal for P to choose D upon observing the postulated $\widehat{\rho}$. Thirdly, $x_S^* > x_P^*$ implies $\rho^{Max}(x_P^* - c) > \rho^{Max}(x_P^* + c)$. Since in equilibrium S will choose the least costly way of signalling, we are looking for two-sided equilibria in which $\underline{z}(\widehat{\rho}) > x_P^* - c$ and $\overline{z}(\widehat{\rho}) > x_P^* + c$. $x_S^* > x_P^*$ makes $x_P^* + c > 2x_S^* - x_P^*$ the binding constraint downwards. That is, $\underline{c} = 2(x_S^* - x_P^*) < c \leq \overline{w} - x_P^* = \overline{c}$ is sufficient for such an equilibrium to exist. The last inequality follows from the fact that for $c > \overline{w} - x_P^*$, only the existence of a one-sided equilibrium can be guaranteed. In all cases, $\rho^{Max}(x_P^* - c)$ is the upper bound on $\widehat{\rho}$.

It is straightforward to prove the existence of a one-sided equilibrium when the sufficient conditions on c are satisfied. I therefore confine myself to proving the existence of a two-sided equilibrium, i.e., that (C7a-c) are satisfied for the levels of c specified. Clearly, the solution will satisfy $\widehat{\rho} \in \left[\rho^{Max}(x_P^* + c), \rho^{Max}(x_P^* - c)\right]$. Because $\left[\rho^{Max}(x_P^* + c), \rho^{Max}(x_P^* - c)\right] = \left[\frac{c - 2(x_S^* - x_P^*)}{\kappa}, \frac{c}{\kappa}\right]$, we are looking for $\widehat{\rho} = \frac{c - \alpha}{\kappa}$, $\alpha \in [0, 2(x_S^* - x_P^*)]$. Inserting this expression as well as those for $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ into (C7a) and simplifying, we get

$$(C9)\alpha = \left[1 - h^*\left(x_P^* - c + \alpha \left| \frac{c - \alpha}{\kappa} \right.\right)\right] 2(x_S^* - x_P^*) \equiv \theta(\alpha).$$

[38] Note that in section 5 of the main text, $\underline{c} = 0$.

Because $h^*(\underline{z}(\widehat{\rho})|\rho)$ is a continuous function of $F(\underline{z}(\widehat{\rho}))$ and $F(\overline{z}(\widehat{\rho}))$, $F(z)$ is a continuous function of $z\ \forall z$, and $\underline{z}(\widehat{\rho})$ and $\overline{z}(\widehat{\rho})$ are continuous functions of ρ (and thus α), $h^*(\underline{z}(\widehat{\rho})|\rho)$ is a continuous function of α. Hence, so is $\theta(\alpha)$. Moreover, $h^*(\cdot) \in [0,1]$, and so $\theta(\alpha)$ has domain and range equal to $[0, 2(x_S^* - x_P^*)]$, which is a compact subset of Euclidean space. Therefore, Brouwer's Theorem applies and $\theta(\alpha)$ has a fixed point α'. That the theorem does not guarantee uniqueness is of no concern here, since S will obviously choose the lowest satisfying (C7a) and his incentives are well understood by P. As noted above, this protest level also satisfies (C7b) with equality. Therefore, it only remains to show that (C7c) holds here too. In fact, one can see that (C7a) holding with equality implies the weak inequality in (C7c), because the left hand side of (C7c) is a weighted average of numbers no larger than $|\underline{z}(\widehat{\rho}) - x_P^*|$ and $|\overline{z}(\widehat{\rho}) - x_P^*|$.

Given that the existence of $\widehat{\rho}$ is established, we can describe the beliefs of P dictated by UD. First of all, if he does observe $\widehat{\rho}$, he should believe that z is located at the cut-off points. The probability that it is located at the lower cut-off point is then the accumulated probability that B has an ideal point in $[\underline{w}, \underline{z}(\widehat{\rho})]$, weighted by the inverse of the probability that $x_B^* \in [\underline{w}, \underline{z}(\widehat{\rho})] \cup [\overline{z}(\widehat{\rho}), \overline{w}]$. The probability that it is located at the higher cut-off point is derived correspondingly. That is, in a two-sided equilibrium, $h^*(\underline{z}(\widehat{\rho})|\widehat{\rho}) = \frac{F(\underline{z}(\widehat{\rho}))}{1-[F(\overline{z}(\widehat{\rho}))-F(\underline{z}(\widehat{\rho}))]}$ and $h^*(\overline{z}(\widehat{\rho})|\widehat{\rho}) = \frac{1-F(\overline{z}(\widehat{\rho}))}{1-[F(\overline{z}(\widehat{\rho}))-F(\underline{z}(\widehat{\rho}))]}$. In a one-sided equilibrium, $\overline{z}(\widehat{\rho})$ does not exist. Hence, $h^*(\underline{z}(\widehat{\rho})|\widehat{\rho}) = 1$. Secondly, if P observes $\rho = 0$, then he knows that $z \in [\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho})]$. As $\varsigma^*(x_B^*) = x_B^*\ \forall x_B^* \in (\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho}))$, $h^*(z|0) = f(z)$ $\forall z \in (\underline{z}(\widehat{\rho}), \overline{z}(\widehat{\rho}))$, while $h^*(\underline{z}(\widehat{\rho})|0) = F(\underline{z}(\widehat{\rho}))$ and $h^*(\overline{z}(\widehat{\rho})|0) = 1 - F(\underline{z}(\widehat{\rho}))$.

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