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Voters' Commitment Problem and Reforms in Welfare Programs

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Voters' Commitment Problem and Reforms in Welfare Programs

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Abstract

Under which conditions do vote-seeking governments pursue reforms in welfare programs that are unpopular among the median voter and that, consequently, likely lead to a loss of votes? This paper proposes reforms may result from a commitment problem of voters between elections. Due to economic voting voters cannot credibly commit to re-elect a non-reforming government during a recession. This study uses a game-theoretical model to investigate what happens when the median voter in a multi-period election game can no longer condition re-election perfectly on the actions of the incumbent government. The model shows that multiple equilibria may emerge, including one with the incumbent government reforming during bad economic circumstances and not reforming during good times. The *voter commitment mechanism* can hereby rationalize the theoretically puzzling empirical phenomenon that governments reform welfare programs amidst reform-averse voters. Our theoretical prediction that they do under economic lows is in line with existing empirical work.

Key words*:* Commitment; Political Economy; Reform; Welfare-Programs

JEL classification*:* D72; D78; H11; H5; I38; J48

1. Introduction

Public opinion research shows that the cards are very much stacked in favor of the welfare state status quo. A majority of the voters, including the crucial median voter who holds the median policy preference, cherishes core welfare programs such as public pensions and unemployment benefits and prefers to uphold the status quo rather than cutting back these programs (Boeri et al., 2001; Blekesaune and Quadagno, 2003; Becker, 2005; Brooks and Manza, 2006; Van Groezen et al., 2009; Schumacher et al., 2010). Consequently, vote-seeking political parties have the best chance of attaining their vote-seeking goal when they refrain from unpopular reforms in these programs. This (political) obstacle to reform is one of the central explanations in the comparative literature on welfare states for why welfare states remain remarkably stable despite mounting pressures for change, such as ageing populations and globalization (e.g. Pierson, 2001; Brooks and Manza, 2007).

Notwithstanding the serious political obstacles to reform, many governments in advanced democracies have pursued reforms that are unpopular according to public opinion data, such as increasing the pension age or cutting back benefits. When do governments do so? When are they willing to accept the electoral risk involved and pursue unpopular reforms of welfare programs? These are questions that have arrived at the forefront in the comparative welfare state literature (see e.g. Starke, 2006; Vis, 2010), but which are not answered satisfactorily yet. Most studies simply assume that when governments get the chance to reform, for instance because the institutions allow it, they will do so. When this involves reforms that are unpopular among most voters, hence including the median voter, the government will turn to so-called blame avoidance strategies to try to divert the blame attached to the reform (Weaver, 1986; Pierson, 1994; Vis and Van Kersbergen, 2007). A possible blame avoidance strategy is to find a scapegoat, like blaming the European Union (EU) for the measures taken. Another is to

include the opposition into the reform plans, so as to offer the voter no other party to turn to. While providing useful insights into how unpopular reform can be implemented, this literature leaves unexplained why some governments do reform and turn to blame avoidance strategies but other governments do not.

This paper adds to the comparative welfare state literature by proposing a mechanism that simultaneously explains the occurrence and the timing of reforms in welfare programs that are unpopular among the median voter. Whereas there exists much political-economic literature about the commitment problem of politicians, the mechanism here, which we call *voters' commitment problem*, instead derives from the commitment problem faced by voters. We present a simple game-theoretical model that formalizes how economic voting makes voters unable to commit to re-elect a government that will not reform during economic hardship. If voters vote economically, they – correctly or not – at least partly blame their government for weak economic performance (Tufte, 1978; Hibbs, 1979; Lewis-Beck and Paldam, 2000). The commitment problem of voters makes that vote-seeking governments are only willing to consider reform when they know they will likely be voted out of office anyway amidst economic hardship. Consequently, an electorate that opposes reform and a government implementing reform are reconcilable. The central empirical implication of our model is that reforms take place during economic downturns only. This implication tallies with the work of for instance Høj et al. (2006). Focusing on 21 OECD-countries between 1975-2003, Høj and colleagues find that economic crises, that is output gaps larger than 4 per cent, are associated with more reform in the labor market and in the product market (see also Pitlik and With, 2003; Vis, 2010).

There is a prominent alternative explanation for the coexistence of economic lows and reforms. It may also result from a sense of urgency on the

side of voters and politicians. Reforms are easier accepted when the (perceived) need for it increases. Awareness and perceptions are indeed important factors which reinforce the mechanism put forward here. We take however the position that political outcomes are ultimately determined by preferences and incentives. The theoretical contribution of the paper is then to show that reforms, vote-seeking politicians and reform-averse voters are reconcilable within a rational agent approach. This in itself does not show that this rational approach is relevant, it does show that the puzzle how and why vote-seeking politicians pursue reforms that voters don't want, does not need to be a puzzle.

The structure of the paper is as follows. First, we discuss the comparative welfare state and political-economic literature on reforms of welfare programs and argue that this literature does not adequately account for the occurrence and, especially, the timing of reforms. Next, we introduce the game-theoretical model, whereby we begin by discussing three central assumptions of the model. Then, we turn to elaborating a special case of the model that provides some intuition on how the model works and subsequently elaborate the general, more realistic model. We end with some concluding remarks.

2. Related literature

When does reform of welfare programs occur? That is to say, what is its timing? The answers put forward in the comparative welfare state literature and the political-economic literature on reform do not fully explain the timing of reforms, as we show below.

2.1 Comparative welfare state research[1]

A first body of comparative literature on reforms of welfare programs argues

[1] This section draws on Vis (2009).

that the main cause for pressure on the welfare state – and thereby for reform – is socio-economic change and the ensuing problem load (Rodrik, 1997; Garrett and Mitchell, 2001; Huber and Stephens, 2001; Pierson, 2001; Iversen, 2005). Theoretically, this argument makes sense. For example, if population ageing is projected to lead to budgetary problems, it is likely that the government will take measures to try to deal with the issue. However, the socio-economic account provides little theoretical footing as regards *when* exactly such measures are taken. When do governments pursue cutbacks that may be necessary, but which are also electorally risky? Why do some "objective" problems lead to reform yet others do not?

A second perspective on reforms of welfare programs focuses on political struggles, sometimes integrating socio-economic variables too. The argument is that the variation in the degree and type of reform is influenced by the partisan complexion of the government (e.g. Ross, 2000; Korpi and Palme, 2003; Allan and Scruggs, 2004) or by the dynamics of party competition (e.g. Kitschelt, 2001; Green-Pedersen, 2002). While offering useful insights into some of the factors that hinder or facilitate reform, this account cannot explain *when* governments engage in electorally risky activities. Why, for example, have unpopular measures been taken by some right-wing and by some left-wing governments in Germany, Denmark, and the Netherlands, but not by others (see Vis, 2009)?

A third body of comparative literature on reforms of welfare programs focuses on the influence of institutions. The usual argument is that countries with the least institutional hurdles, and therefore the highest degree of power concentration, should display the highest degree of reform. Consequently, reform should be higher in Westminster countries (such as the United Kingdom) than in political systems with a high level of power fragmentation (like Switzerland and the United States). Several empirical studies support this hypothesis (e.g. Bonoli, 2001; Swank, 2001). However, some authors note that

the reverse relationship is also plausible (see Ross, 1997). Political systems concentrating political power also concentrate political accountability. As a result, '(…) voters know very well who they may blame for unpopular cutbacks' (Starke, 2006: 109). In political systems where power is fragmented, conversely, avoiding blame for unpopular measures is easier (Weaver, 1986; Pierson, 1994), which may result in more cutbacks. The institutionalist approach has been helpful for explaining the cross-national variation in welfare reform. However, it cannot explain the *when* of reform as governments in the same country face the same institutional constraints and opportunities (Armingeon et al., 2005), yet display various degrees of reform.

A final strand of literature proposes that ideas matter for reforms of welfare programs. The argument here is that by invoking a specific discourse or imperative, governments may overcome the hindrances to change and successfully implement reform (Cox, 2001; Schmidt, 2002; Stiller, 2007; see Campbell, 2002; Lieberman, 2002). Studies focusing on the importance of ideas have added to the knowledge of the process of welfare reform. However, this literature offers little theoretical foothold as regards *when* ideas matter (see Lieberman, 2002). Klitgaard (2007) offers a partial solution to the question of when reform of welfare programs occurs by arguing that Social Democratic parties in universal (Social Democratic) welfare states pursue market-oriented reforms when the party elite considers the policy problems to be a threat to the welfare state's legitimacy. However, this explanation cannot be generalized to other type of parties or types of welfare regimes, as it premises on the assumption that the universal welfare state is a power resource for Social Democratic parties.

2.2 Political economy of reform of welfare programs

Next we discuss political-economic literature on reforms of welfare programs. The studies we focus on deal with pension reforms but the arguments they

present are not necessarily limited to the reform of pension programs. Many pension reforms, in particular the increase of the retirement age, are taken during recessions. As these reforms hit virtually the whole population, they qualify as unpopular reforms that affect the median voter negatively. This is certainly not to deny that small incremental changes in pension entitlements may matter as well, but our model does not focus on these latter reforms.

Selén and Ståhlberg (2007) posit that the pension reform in Sweden, which gradually transformed the public defined-benefit pension system into a so called notional defined contribution one, could be implemented successfully because the reform would benefit a majority of the voters. Adopting a political-economic perspective, they argue that the winners who would vote in favor of the reform outnumber the losers who would vote against it, accounting for the reform. The underlying assumption that voters know *ex ante*, and with a fair amount of certainty, if they are a winner or loser of the reform is problematic. For most voters, pension systems are complex – to say the least. Calculating the present value of expected pension benefits and expected contributions in the old and the proposed new system is something that surely goes well beyond the capacities of the 'average' voter (see Boeri et al. 2002).

In a recent political-economic contribution, Kemmerling and Neugart (2009) propose that countries in which financial markets are politically powerful – measured by among other things the degree of assets held by institutional investors as a share of GDP –, are more likely to pursue pension reform that increases the private savings component. The reason is that financial markets have an interest in such reforms, as they typically manage defined-contribution schemes. Although this argument is plausible, it fails to account for the large-scale pension reform that included a shift toward defined-contribution in, for example, Sweden (Selén and Ståhlberg, 2007), as the financial market of that country is comparatively weak (BIS, 2007).

3. A new mechanism: Voters' commitment problem

We propose a new mechanism, labeled *voters' commitment problem*, to account for the timing of reforms of welfare programs in democratic systems. The thrust of the argument is that due to economic voting voters cannot commit to re-elect a government that will not reform when the economy is in a poor state. Due to this commitment problem, reforms of welfare programs take place during economic lows only.[2] Elections come with a pre-election commitment problem on the part of politicians, as they cannot commit themselves to implement the plans they propagate during elections. When in office, they may use their power to break the election promise with the voters. The crucial aspects of elections, the ability to 'throw the rascals' out at the next election, partly solves this commitment problem. There is however a

[2] This mechanism differs from political-economic explanations that focus on the absence of reform. This literature has often assigned the absence of reform to the 'nonneutrality' in the distribution of gains and losses in society. Reform is non-neutral because the winners from the status quo are assumed to be politically strong, whilst the losers are politically weak. Fernandez and Rodrik (1991) expand the argument, stating that it is the uncertainty about the distribution of gains and losses that impedes reform. If some of the winners and losers of the reform cannot be identified *ex ante*, the status quo is likely to prevail. In principle, reform and its absence are two sides from the same coin. However, a number of important theories accounting for the absence of reform fail to adequately explain its occurrence. Pierson's (2001) argument that political obstacles impede reform is one of them. Also Fernandez and Rodrik's (1991) work helps one to explain better the absence of reform than its presence, although the latter authors do specify a condition under which reform occurs (certainty over the distribution of gains and losses).

similar commitment problem *between* elections on the side of the voters. This problem results from economic voting. Voters generally oust a government during an economic recession because they blame politicians, at least partly, for it. Due to the omnipresence of economic voting (see below), the promise to do otherwise in the absence of reform is therefore not credible. The pledge of the median voter before the election to re-elect the government if it refrains from a reform is therefore not believable and certainly not enforceable. Consequently a vote-seeking government might reform during a recession, as reform of one or more welfare programs will not influence the prospect of re-election. The only consideration for the government is whether they intrinsically support the reform in the first place, which may be the case because of its ideological preference.

To formalize the argument, we propose a tractable game that captures economic voting and the commitment problem that comes with it in a simple way. First, we discuss the players and their preferences (section 3.1) and the assumptions of the model (section 3.2). Then, we turn to the set-up of the model (sections 3.3) and present a special case of the model that provides insight and intuition about how elections can discipline politicians (section 3.4). Finally, we elaborate on the most general version (sections 3.5 and 3.6).

3.1 The players and preferences

Let us first discuss the preferences of the players in the game. There are three players in the game: two politicians and one voter (the median one). Focusing on one voter only may seem too strict an assumption and one that does away too easily with the possible heterogeneous preferences of voters regarding reform. Although we do not dismiss the fact the voters' preferences may very well vary, from the perspective of the governing party (or parties in a coalition government), the median voter's preferences are key. There is an extensive body of literature that shows that mainstream parties, which typically make up

the government, cater to precisely this median voter (e.g. Adams et al., 2004, Adams et al., 2006, Adams et al., 2009; Ezrow et al., 2010). If the median voter opposes reform of one or more welfare programs – either because it hurts his or her own consumption directly or because he or she sociotropically cares about the income of welfare programs' recipients –, the reform entails an electoral risk for the governing party (or parties). Since there is ample survey research showing that the median voter prefers the status quo to reform and that, consequently, reform of one or more welfare programs is politically risky and something we would theoretically expect vote-seeking parties to steer clear from. In our model, we set out to identify those conditions under which vote-seeking parties reform nonetheless. Our focus on two politicians, who can be seen as two political parties, means that our model applies directly to two-party systems such as the US, Malta or – to a lesser extent – the UK

What are the players' utility functions? The two politicians both have a time-additive utility function, V_t, with a felicity function $U(x_i)$ which is concave and positive and where x_i represents consumption at time i. The discount rate is β. The utility-function at time t is given by:

$$V_t = \sum_{i=t}^{\infty} \beta^{(i-t)} U(x_i)$$

At each point of time one and only one politician holds office. If a politician is out of office, he or she does not have any decision to make and utility is normalized to 0. If the politician is in office he or she receives a positive endowment $w > 0$.

The median voter also has a time-additive utility function with a well-behaved felicity function, denoted $W(c)$. In each period the voter consumes c_g in good economic times and c_b in bad economic times with $c_g > c_b > 0$. We assume, realistically as we argue above, that the median voter dislikes reform.

The negative effect of a reform equals θ of consumption. This cost of reform is strictly positive but such that consumption in both economic circumstances remain positive, so $c_g - \theta > c_b - \theta > 0$. As the felicity function is increasing in consumption it follows that $W(c_g - \theta) > W(c_b - \theta)$.

The preferences of the median voter are therefore such that under all circumstances he or she prefers no reform (the status quo) to reform. It is further necessary to assume that reforms are the only (salient) issue in elections.

3.2 Assumptions of the model

The model we present hinges on three underlying assumptions. The first is that reforms are unpopular among (most) voters and, crucially important, the median voter. We have already argued that public opinion research into voters' preferences regarding welfare programs and reforms therein offers ample support for the plausibility of this assumption. Boeri et al. (2002), for example, find in a survey of the opinions on pension reform in Germany and Italy that most voters, including the median voter, oppose reform in welfare programs and instead favor the state quo. Related, Van Groezen et al. (2009) find that a preference for the status quo induces voters, again including the median one, to be weary of pension reforms, even if these might improve their financial position in the longer term. Other scholars have found similar preferences as well for welfare programs other than pensions (e.g. Boeri et al., 2001; Blekesaune and Quadagno, 2003; Becker, 2005; Brooks and Manza, 2006; Schumacher et al., 2010).

A second assumption is the imminence of economic voting. There is a widespread consensus in the literature that economic voting is 'a generalized phenomenon in industrial democracies' (Pacek and Radcliff, 1995: 44; see Van der Brug et al., 2007), indicating that this is a plausible assumption. This does not mean that economic voting is equally strong in all electoral systems. In

majoritarian systems, which typically have a one-party government, it is clear who is to blame for the economic failure. This higher clarity of responsibility makes that voters are more likely to vote retrospectively (that is economically) than in systems with lower degrees of clarity. Examples of the latter are systems with minority governments or parliamentary ones (Powell and Whitten, 1993; see also Whitten and Palmer, 1999). Since our game-theoretical model is closest to a majoritarian system with a one-party government, the lower relevance of economic voting in other electoral systems is not a problem.

A final assumption is that governments are first and foremost vote-seeking (Downs, 1957), but that they can also be office-seeking or policy-seeking. With this assumption, we follow the behavioral literature on political parties (Strøm, 1990; Müller and Strøm, 1999). In the model, a government faces a trade-off between 1) remaining in office by catering to the wishes of the median voter, which means the government behaves vote-seeking, and 2) exclusion from office by adopting a policy that goes against the wishes of the median voter, which means that the government acts policy-seeking. In particular, when facing sure electoral defeat the policy-seeking motive dominates, as winning office is no longer possible.

Note that since both the median voter and the politicians are rational and forward-looking in our model, the argument offers a rationalization of the occurrence and timing of reforms and thereby does not depend on bounded rationality or irrationality of any actor, which is not to deny that both may be relevant.

3.3 The stage-game

For both the politician in office and the median voter, the following stage game enrolls:

1. There is a move by nature that determines the economic circumstances.

With probability λ the economic circumstances are good, with probability 1-λ they are bad.

2. Next, the politician in office can choose between two actions. The first is to reform, the second is to stick to the status quo with no reform. In the case of reform, the politician receives, next to w, a positive amount $r > 0$. This may be interpreted as his or her personal benefit of reforming, for instance in the form of ideological satisfaction.

3. After observing the state of the economy and the action of the politician, the median voter has the option to either re-elect the politician or not. If the politician is not re-elected, the other politician is automatically elected. The graph depicts the sequence of the stage game where the (re)installment of the new government at $t = 4$ closes the stage game.

=*Graph 1 about here*=

The action space of the politicians consists of two actions, reform and no reform. The action space of the median voter also consists of two actions, re-election or no re-election. We restrict the strategies and the equilibria of the players in several ways. First, we only consider pure strategies. Second, we restrict attention to Markov equilibria. In Markov equilibria, actions of players are a function of the current, pay-off relevant state. Here this state is defined as the state of the economy (either good or bad). This rules out that the players condition their actions on the entire economic history or the history of others players' actions. Third, as we assume the two politicians to be identical, we only consider symmetric equilibria where both politicians have the same strategy.[3]

[3] Note that the assumption of identical politicians does not imply that the political parties have identical preferences on all other issues. It only means that both parties take the preference of the median voter into account in their

For the politician a strategy maps the state of the economy into the action *reform* or *no reform*. A strategy thus consists of a pair that prescribes the action when the economy is in a bad and good state, respectively. The voter has a strategy that maps the economic condition and the action of the politician into the action re-election or no re-election. Therefore the strategy of the voter has to prescribe an action in four circumstances, conditional on the state of the economy (either good or bad) and on the action of the politician.

3.4 Equilibria with perfect conditioning

First, we consider the situation where the voter can condition re-election perfectly on the occurrence of reform. This is a special case of the more general version of the model we present later. Economic circumstances are not relevant in this first model, which means that the voter has the optimal strategy to re-elect a politician that does not reform and does not re-elect a politician that reforms. Subsequently, there are two potential pure strategy equilibria; one with both politicians always reforming and one with both politicians never reforming.

The equilibrium with both politicians always reforming occurs if the following condition holds:[4]

$$U(w+r)-U(w)>\frac{\beta}{1-\beta}U(w)-\frac{\beta^2}{1-\beta^2}U(w+r) \qquad \text{(i)}$$

The left-hand side gives the immediate gain of reforming compared to not reforming. The right-hand side gives the difference of the remaining lifetime utility of never reforming and the lifetime utility of always reforming (given

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decisions as regards reforms of welfare programs. As we elaborate in the main text, this is a plausible assumption.

[4] Here and in the remainder of the paper, the familiar convergence result of a geometric series is used.

that the other politician always reforms). In the latter case both politicians are in office every second period and reform when they are. Under condition (i), given that the other politician always reforms, it is best to do likewise. As the two politicians are similar, this constitutes a Nash-equilibrium. Note that if β=0, the condition is always met, as r>0. In that case, future income is not considered at all and reforming is more attractive.

Another possible equilibrium is one with both politicians not reforming. A necessary condition for such an equilibrium is:

$$U(w+r)-U(w)<\frac{\beta}{1-\beta}U(w) \qquad \text{(ii)}$$

Note that if β=0, the condition is never met. This condition states that – given that the other politician never reforms – never reforming and hence holding office forever after, leads to higher life-time utility than reforming once and never being (re)elected again.

Summarizing, there are three possibilities.

1. $U(w+r)$ - $U(w)$ is small and condition (ii) is met and condition (i) is not met. This means that lifetime utility of always holding office is large. Reforming is not attractive, even if the other politician does likewise. The equilibrium with both politicians never reforming occurs.

2. $U(w+r)$ - $U(w)$ is large and condition (i) is met and condition (ii) is not. Utility of even a onetime reform is large and there will always be reform. In that case there is no way for the voter to discipline the government by not re-electing him.

3. $U(w+r)$ - $U(w)$ has an intermediate value and both condition (i) and (ii) are met; then both equilibria are possible. Which one occurs, depends on the ability of the two politicians to coordinate the equilibrium of both of them reforming. That equilibrium will provide both politicians with a higher lifetime utility than the equilibrium where both never reform. If the politicians indeed succeed in coordination, a further strategy of the voter could be to never re-elect one of the two politicians once he reformed and to always re-

elect the other one, irrespective of him reforming or not. With such a strategy of the voter, the politician the strategy is aimed at will not reform. Note that it is not possible that both conditions are not met, as the right-hand side of condition (ii) is larger than the right-hand side of condition (i).

3.5 Equilibria with economic voting

We now turn to the more general and more realistic version of the model wherein the voter can only condition re-election imperfectly on the action of the politician in office. As an extreme case of economic voting, the politician is never re-elected when the economy is slowing down, irrespective of whether he reformed. This constitutes the commitment problem of the voter who cannot credibly commit to re-electing a government that does not reform. Consequently, the politician will always reform during a recession. For the politician reforming does not alter the prospects of being re-elected while there is a positive pay-off $r>0$. During booms, a politician is still never re-elected after a reform, as before.

Again, two equilibria are possible. The appendix shows the following necessary condition (iii) for an equilibrium where both politicians will *not* reform in good times; this is the analogy of condition (ii):

$$U(w+r)-U(w)<\frac{\beta(1-\lambda\beta)[\lambda U(w)+(1-\lambda)U(w+r)]}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}-\frac{\beta^2(1-\lambda)U(w+r)}{1-\beta\lambda-(1-\lambda)\beta^2} \qquad \text{(iii)}$$

Note that condition (iii) reduces to condition (ii) if $\lambda=1$. In this particular case economic circumstances are always positive and the voter can perfectly condition re-election on the actions of the politicians. Note also that if $\beta=0$, the condition never holds; in that case the future is not taken into account by both politicians and they will therefore always reform.

For the equilibrium with both politicians reforming the necessary condition reads:

$$U(w+r)-U(w)>\frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2}[\lambda U(w)+(1-\lambda)U(w+r)]-\frac{\beta^2}{1-\beta^2}U(w+r) \quad \text{(iv)}$$

Note that, as before, condition (iv) reduces to condition (i) if λ=1. Note also that if β=0, the condition always holds.

In the appendix, we show that the right-hand side of condition (iii) is larger than the right-hand side of condition (iv). Therefore it is not possible that both conditions are not met and there is always at least one equilibrium. Generally, there are again three possibilities. A unique equilibrium with both politicians always reforming; a unique equilibrium with both never reforming during booms; and the possibility that there are two equilibria. Which one occurs in the latter case depends on which equilibrium the two politicians coordinates. The equilibrium where both reform has higher life-time utility than the one where neither reforms. This follows from the observation that condition (iii) is met and it is then better not to reform than to reform, given that the other politician does not reform. Condition (iv) is also met, implying that it is better to reform than not to reform, given that the other politician reforms. It holds that not reforming when the other reforms gives a higher lifetime utility than not reforming when the other does not reform. In both cases, the politician has the same income when in office and is only out of office after bad economic circumstances. In the latter case however the probability of coming back into office is smaller, as the other politician does not reform during booms. Combining these observations, it holds that in the case of multiple equilibria, the two politicians have higher lifetime utility in the equilibrium of both reforming than of both not reforming. For the voter the opposite holds; the equilibrium with both not reforming provides higher lifetime utility.

3.6 Comparative statics

We investigate the comparative statics to assess how the willingness to reform and the ability of voters to discipline politicians is influenced by the four different parameters in the model (see table 1).

=*Table 1 about here*=

It can be shown that, ceteris paribus and for all w, condition (iii) will more likely be met when the endowment w increases, that is the right-hand side increases more than the left-hand side. If the endowment increases, reform is less likely to occur. This follows as reform leads to the loss of the endowment w in the next period and possibly subsequent periods. The higher this loss is, the less likely a government is to reform. This implies that higher income for government members – the endowment w – decreases the probability of reforms during prosperous economic times. The opposite holds for condition (iv); the higher w is, the less likely the condition is met and the less likely is an equilibrium with both reforming.

Furthermore, ceteris paribus and for all r, condition (iii) will less likely be met when rents r increase; then the right-hand side decreases more than the left-hand side. The higher r is, the more likely reform is. This formalizes that higher rents of reform make its undertaking more attractive. The opposite holds for condition (iv); the higher is r, the more likely the condition is met and the more likely is an equilibrium with both reforming.

For both conditions, the comparative statics of λ and β are not straightforward. The partial derivative of the bound can be both positive and negative. This means that a higher value of the probability of economic hardship and a higher value of the discount rate do not have an unambiguous effect. Consider for example the equilibrium that both reform during good economic times (and are voted out of office because of that). A higher

subjective discount rate probability increases the value of keeping office as the expected future gains that come with it increase. However, it also increases the discounted values of future reforms during good times. These counteracting effects depend on the discount factor β in a non-linear way. Neither of the effects dominates and thus the net effect can go both ways. The sign depends on the particular values of the parameters and the functional form of the utility function, making general predictions of the effect impossible.

4. Discussion and conclusion

Under which conditions do vote-seeking governments pursue reforms in welfare programs that are unpopular among the median voter and that, consequently, likely lead to electoral punishment? Existing work in comparative welfare state research and the political economy of reforms offers some helpful starting points, but does not provide a convincing answer to this question. In this paper, we have presented a simple game-theoretical model to identify when and under which conditions politicians pursue unpopular reforms and when they do not. We have shown that parties that primarily seek votes can still opt to reform welfare programs when the very same voters the parties adhere to do not want that. In the model we stack the cards against this outcome by assuming that parties are first and foremost vote-seeking and that voters are reform-averse. Our model shows that even in this reform-hostile setting, a reform of welfare programs in a democracy is reconcilable with the median voter opposing such reforms.

The result of our model helps us to solve a theoretical puzzle in the literature on unpopular reforms in welfare programs. In line with for example Høj et al. (2006), the empirical implication of our model is that reforms of welfare programs, if at all, are initiated during recessions. Our contribution lies in presenting the underlying theoretical mechanism that the occurrence

and timing of reforms spring from an intrinsic commitment problem of voters in times of economic recession. Due to economic voting, there is a high chance that the incumbent party or parties will not be re-elected, irrespective of their particular policy. Subsequently, the vote-seeking motive of parties gives way to a policy-seeking motive of governments.

The empirical implication of our model, reform occurring during economic lows, contributes to the socio-economic account in the comparative literature on the welfare state by identifying the condition under which an "objective" socio-economic problem matters: socio-economic dire straits. Economic setbacks allow a government to act against the wishes of the median voter, as the government knows that the poor socio-economic situation is likely to lead to electoral defeat anyhow. Moreover, and putting theoretical body to the literature on ideas, a poor socio-economic state enables a government to act on its ideas or interests. As regards studies focusing on partisanship, our model shows that the color of the government does not matter, as both leftist and rightist politician face a median voter that opposes reform of welfare programs. The empirical work of for instance Vis (2010) corroborates this prediction.

Our model with two politicians and one voter (the median one) captures advanced democracies with a two-party system and majority, or plurality, one-party government. The number of such countries is low since most countries have more than two parties (although when the number of parties is low, single-party governments still emerge typically). In future work, it would be interesting to see if expanding the number of parties, and thus politicians, in our model changes the outcome of the game.

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Graph 1

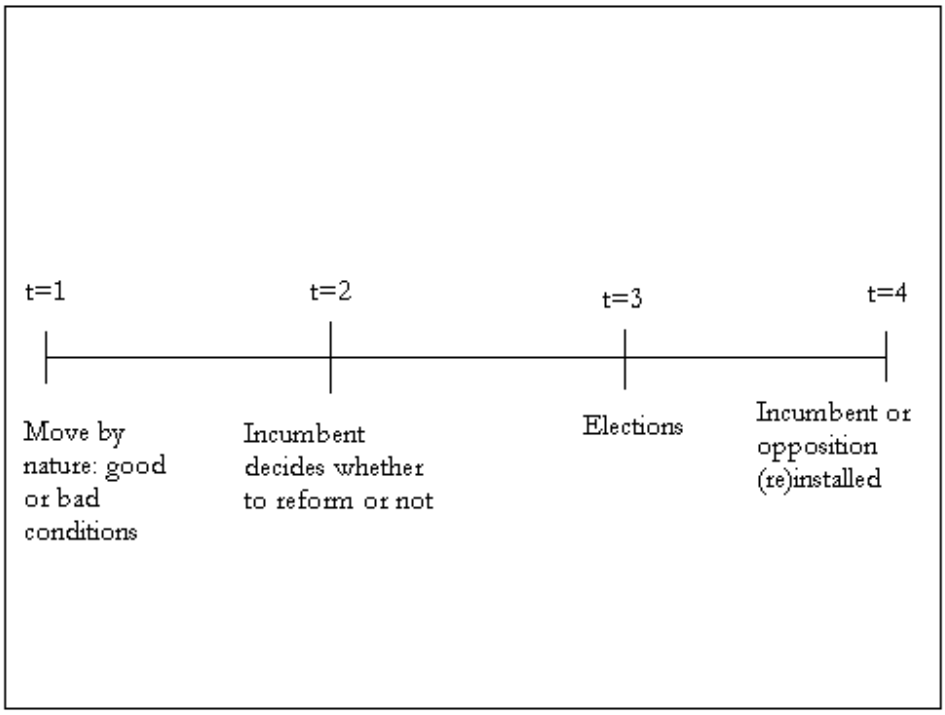
t=1
t=2
t=3
t=4
Move by nature: good or bad conditions
Incumbent decides whether to reform or not
Elections
Incumbent or opposition (re)installed

Table 1

Comparative statics	Condition (iii)	Condition (iv)
w	+	-
r	-	+
λ	+/-	+/-
β	+/-	+/-

Appendix

This appendix derives some results given in the main text.

Derivation of equation (iii)

Equation (iii) gives the condition for the equilibrium where both politicians do not reform during booms:

$$U(w+r)-U(w)<\frac{\beta(1-\lambda\beta)[\lambda U(w)+(1-\lambda)U(w+r)]}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}-\frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2}U(w+r)$$

To derive this condition, assume the first of the two politicians does not reform. It is best for the second politician to do likewise if, given the first politicians' strategy, the life-time utility of no reform is at least as high as that of always reforming.

If the second politician reforms during good times, he has utility $U(w+r)$ when in office and is then voted out. When out of office he will at one point be back in office, so he also has a positive life-time utility at the beginning of the next period when still out of office, denoted here U^{out}. U^{out} can be determined in a recursive manner:

$$U^{out}=(1-\lambda)[\beta U(w+r)+\beta^2 U^{out}]+\beta\lambda U^{out}$$

With probability 1-λ economic circumstances will be bad, and the other party will be voted out. Then the politician will be back in office within one period. Otherwise, he remains out of office which provides lifetime utility of U^{out} the next period. Solving this equation:

$$U^{out}=\frac{(1-\lambda)\beta}{1-\beta\lambda-(1-\lambda)\beta^2}U(w+r)$$

This gives life-time utility of reforming of:

$$U(w+r)+\beta U^{out}=U(w+r)+\beta\frac{(1-\lambda)\beta}{1-\beta\lambda-(1-\lambda)\beta^2}U(w+r)$$

If the second politician does not reform during good times, he has utility U(w) and he stays in office. This gives lifetime utility:

$$U(w) + \beta U^{in}$$

It remains to determine U^{in}. This can be determined with the following two equations:

$$U^{in} = \lambda[U(w) + \beta U^{in}] + (1-\lambda)[U(r+w) + \beta U^{out}]$$

$$U^{out} = \lambda\beta U^{out} + (1-\lambda)\beta U^{in}$$

Here U^{in} and U^{out} are the lifetime utility of entering the stage game while being in and out of office respectively. When a politician is currently in office, he faces a probability λ that economic times will be good. If so, he receives both his endowment w and he remains in office, which offers again the prospect of U^{in} the next period, discounted by β. With a probability 1- λ economic times will be gloomy, in which case he will reform and thus receive $w+r$. In the next period he will be out of office, and has the prospect of U^{out}, discounted.

Now consider the latter equation:

$$U^{out} = \lambda\beta U^{out} + (1-\lambda)\beta U^{in} \Rightarrow$$

$$U^{out} = \frac{(1-\lambda)\beta}{1-\lambda\beta} U^{in}$$

This gives an expression for U^{in} in terms of U^{out}. Using this:

$$U^{in} = \lambda[U(w) + \beta U^{in}] + (1-\lambda)[U(r+w) + \beta U^{out}] \Rightarrow$$

$$U^{in} = \lambda[U(w) + \beta U^{in}] + (1-\lambda)[U(r+w) + \frac{\beta^2(1-\lambda)}{1-\beta\lambda}U^{in}] \Rightarrow$$

$$U^{in} - \beta\lambda U^{in} - \frac{\beta^2(1-\lambda)^2}{1-\beta\lambda}U^{in} = \lambda U(w) + (1-\lambda)U(r+w) \Rightarrow$$

$$U^{in}[1-\beta\lambda - \frac{\beta^2(1-\lambda)^2}{1-\beta\lambda}] = \lambda U(w) + (1-\lambda)U(r+w) \Rightarrow$$

$$U^{in}[\frac{(1-\beta\lambda)^2 - \beta^2(1-\lambda)^2}{1-\beta\lambda}] = \lambda U(w) + (1-\lambda)U(r+w)$$

Now it remains to working out the brackets:

$$U^{in}[\frac{(1-\beta\lambda)^2 - \beta^2(1-\lambda)^2}{1-\beta\lambda}] = \lambda U(w) + (1-\lambda)U(r+w) \Rightarrow$$

$$U^{in}[\frac{1-2\beta\lambda-\beta^2+2\beta^2\lambda}{1-\beta\lambda}] = \lambda U(w) + (1-\lambda)U(r+w) \Rightarrow$$

$$U^{in} = [\frac{1-\beta\lambda}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}][\lambda U(w) + (1-\lambda)U(r+w)]$$

Lifetime utility of no reform is:

$$U(w) + \beta U^{in} = U(w) + \beta\frac{1-\beta\lambda}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}[\lambda U(w) + (1-\lambda)[U(r+w)]$$

The politician will not reform if:

$$U(w) + \frac{\beta(1-\beta\lambda)[\lambda U(w) + (1-\lambda)[U(r+w)]}{1-2\beta\lambda-\beta^2+2\beta^2\lambda} > U(w+r) + \frac{(1-\lambda)\beta^2 U(w+r)}{1-\beta\lambda-(1-\lambda)\beta^2}$$

Derivation of condition (iv)

An equilibrium with both reforming may arise if:

$$U(w+r) - U(w) > \frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2}[\lambda U(w) + (1-\lambda)U(w+r)] - \frac{\beta^2}{1-\beta^2}U(w+r)$$

Given that the other politician reforms, it is best to do likewise during a boom if the life-time utility of reform is at least as high as that of not reforming during booms. If the politician also reforms, he has $U(w+r)$ immediately and

every second period. This leads to life-time utility of:

$$\frac{1}{1-\beta^2}U(w+r) = U(w+r) + \frac{\beta^2}{1-\beta^2}U(w+r)$$

When the politician does not reform he receives utility $U(w)$ and stays in office. Denote the lifetime utility of being in office U^{in} and of being out of office U^{out}. These can be determined by solving the following two equations that recursively define both:

$$U^{in} = \lambda[U(w) + \beta U^{in}] + (1-\lambda)[U(r+w) + \beta U^{out}]$$

$$U^{out} = \beta U^{in}$$

Solving these two equations give:

$$U^{in} = \frac{\lambda U(w) + (1-\lambda)U(w+r)}{1-\beta\lambda-(1-\lambda)\beta^2}$$

This gives the condition for both reforming:

$$U(w+r) + \frac{\beta^2}{1-\beta^2}U(w+r) > U(w) + \beta\frac{\lambda U(w) + (1-\lambda)U(w+r)}{1-\beta\lambda-(1-\lambda)\beta^2}$$

Right-hand side of condition (iii) larger than that of condition (iv)

Condition (iii) and (iv) are respectively:

$$U(w+r) - U(w) < \frac{\beta(1-\lambda\beta)}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}[\lambda U(w) + (1-\lambda)U(w+r)] - \frac{\beta^2(1-\lambda)U(w+r)}{1-\beta\lambda-(1-\lambda)\beta^2}$$

$$U(w+r) - U(w) > \frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2}[\lambda U(w) + (1-\lambda)U(w+r)] - \frac{\beta^2}{1-\beta^2}U(w+r)$$

To show:

$$\frac{\beta(1-\lambda\beta)}{1-2\beta\lambda-\beta^2+2\beta^2\lambda}[\lambda U(w) + (1-\lambda)U(w+r)] - \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2}U(w+r) >$$

$$\frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2}[\lambda U(w) + (1-\lambda)U(w+r)] - \frac{\beta^2}{1-\beta^2}U(w+r)$$

First note that:

$\frac{\beta^2}{1-\beta^2} > \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2}$ This follows from:

$$\frac{\beta^2}{1-\beta^2} > \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2} \Leftrightarrow \frac{1}{1-\beta^2} > \frac{(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2} \Leftrightarrow$$
$$1-\beta\lambda-\beta^2+\lambda\beta^2 > (1-\lambda)(1-\beta^2) \Leftrightarrow 1-\beta\lambda-\beta^2+\lambda\beta^2 > 1-\lambda-\beta^2+\lambda\beta^2 \Leftrightarrow$$
$$-\beta\lambda > -\lambda \Leftrightarrow \beta < 1$$

Second note that:

$$\frac{\beta(1-\lambda\beta)}{1-2\beta\lambda-\beta^2+2\beta^2\lambda} - \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2} > \frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2} - \frac{\beta^2}{1-\beta^2}$$

This follows from:

$$\frac{\beta(1-\lambda\beta)}{1-2\beta\lambda-\beta^2+2\beta^2\lambda} - \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2} > \frac{\beta}{1-\beta\lambda-(1-\lambda)\beta^2} - \frac{\beta^2}{1-\beta^2} \Leftrightarrow$$
$$\frac{\beta}{1-\beta^2} + \frac{(1-\lambda\beta)}{1-2\beta\lambda-\beta^2+2\beta^2\lambda} > \frac{\beta(1-\lambda)+1}{1-\beta\lambda-(1-\lambda)\beta^2}$$

For λ=0, there is equality with both terms equaling $\frac{1+\beta}{1-\beta^2}$. The derivative of right-hand side with respect to λ equals zero, whereas the derivative of the left-hand side is proportional to $\beta(1-\beta)^2>0$. Therefore the left-hand side is larger than the right-hand side for all $0<\lambda<1$. As this holds for all $0<\beta<1$, the inequality follows.

From this inequality the original condition follows if r=0. When r>0, it holds that $U(w+r)>\lambda U(w)+(1-\lambda)U(w+r)$. From $\frac{\beta^2}{1-\beta^2} > \frac{\beta^2(1-\lambda)}{1-\beta\lambda-(1-\lambda)\beta^2}$ it follows that the right-hand side decreases faster in r than the left-hand side. Therefore the condition also holds for any r>0.