Party polarization and electoral accountability

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Abstract

In this paper we model the interaction between parties and candidates to highlight the mechanisms by which parties, as long-lived "principled organization" selecting candidates, may discipline elected legislators. We consider a multidimensional policy space comprising an ideological and a monetary dimension. Candidates are policy motivated on the ideological dimension only, and have opposing interest with respect to citizens on the monetary dimension. Since motivated candidates care more about winning elections the bigger the ideological distance from the candidate of the opponent party, parties can strategically choose the polarization of the electoral race to provide incentives to candidates and win elections. Platform divergence is essential to obtain electoral accountability and the degree of party polarization prevailing in equilibrium turns out to be a compromise between policy preferences of party members and electoral goals. Finally, when parties converge to the median voter, electoral accountability is inevitably compromised.

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The political parties that I style great are those which cling to principles rather than to their consequences; to general and not to special cases; to ideas and not to men (Tocqueville 1835).

1 Introduction

Parties are organizations acting as political intermediaries between candidates and citizens. As such, parties accomplish many important functions. First, they select candidates. Second, they can provide information on candidates and monitor the performance of elected politicians.[1] In this work we focus on candidates selection to ask whether competing political parties are efficient in accomplishing this very important task, i.e. whether they choose candidates, who once in office, will act in the best interest of their constituents. Therefore this paper, modelling the interaction between parties and candidates, develops a formal analysis of the candidate selection process as a tool to control elected officials.

The question of the control of elected politicians is a typical delegation problem. Party members select candidates, and constituents voting for them delegate to elected legislators the choice of policies. When candidates are policy motivated, parties and citizens know that the winner of the electoral race will implement his most preferred policy.[2] However, in the absence of policy motivation, policies may be negotiable and outcomes depend on the incentives faced by legislators. We can illustrate a typical delegation problem with some examples. Consider a public policy that has an ideological and a monetary dimension. The ideological dimension can be represented by the rules to follow in the provision of goods often supplied by the state such as health or education,[3] and the monetary dimension is the total cost of provision, paid by the citizens through taxes. Suppose that individuals are policy motivated on the ideological dimension on which they are not willing to compromise. On the other hand, the monetary dimension is not fixed and the politicians' choice will depend on the incentives they will face.

[1] Often parties originate as associations of citizen bound together by ideological concerns. The political science literature on parties goals is vast. For a brief overview on the goals of political parties see Schlesinger (1975). On the informational rationale for political parties see Caillaud and Tirole (2002) and Snyder and Ting (2002).

[2] Policy-motivated candidates cannot commit to choose policies that do not reflect their preferences (Alesina (1988); Besley and Coate (1997); Osborne and Slivinski (1996)).

[3] Examples of these rules can go from procedures to regulate the provision of the service (such as, for example, universal versus restricted access) to formulas to allocate total spending across different services or various aspects of a service, etc.

For example, if private firms are involved in various ways in the supply of these goods, they could lobby the incumbent legislator to charge a high cost of provision and share the corresponding benefits. Alternatively, if a policy can be realized at low cost, but the legislator can divert money from the public funding to his pocket, then the policy maker may choose a high level of taxes and capture the monetary surplus from the realization of the low cost policy. Finally, the implementation of a low cost policy may require more effort from the legislator as compared to a high cost project. In this case, again the legislator can gain from choosing the more expensive policy. In all these examples, the politician faces incentives inducing a policy against the interests of the constituents, and in this paper we ask whether parties can help voters to solve this type of accountability problem.

Do parties work in the interest of the citizenry? The notion of "great" political parties inspired by principles and acting for the sake of the "public good" is cherished by Tocqueville (1835) in his pioneering writings on the role of parties in the American democracy. Those "great parties", originating from the irreconcilable divide of citizens with respect to different policy dimensions, are typically permeated by an ideological bent. Nevertheless, they may play an important and positive role as "principled" organizations aiming at the realization of some ideal goal. Yet, the ideological divide of parties is often depicted as a negative characteristic of the political process and, according to several scholars and commentators, party polarization represents a dangerous departure from the basic principles of a representative democracy, which should first and foremost protect the interests of the majority of citizens.[4] Hence, the question arises of whether ideological parties, who are distant from the median voter, can really act in the interest of the majority of citizens. In this paper we will challenge the view that party polarization is detrimental to the median voter and show how in, a multidimensional policy space, ideological party members, though more extreme than the median voter on some issues, may ultimately choose candidates serving the overall interest of the majority of voters. In our set up, parties are ideological and want to win elections in order to implement their ideological line. Candidates also seek reelection for ideological reasons, however their interests diverge from those of parties and voters on non-ideological stances (such as the monetary dimension) that generate private benefits for the politician. Hence, candidates may be willing to compromise reelection to obtain private benefits. In this framework we show that purely ideological parties

[4]For different critical views about party polarization in American politics see for example Fiorina et al. (2005), Layman et al. (2006), McCarty et al. (2006) and Krugman (2006).

using *only* their candidate selection strategy may be able to finally bring to power accountable legislators. Hence, parties can be an effective institutional device for electoral accountability even though they have limited instruments (candidate selection) and they care more about a subset of the policy space (ideology).

The outline of the model is as follows. Infinitely lived citizens have preferences over a two-dimensional policy space comprising an ideological and a monetary dimension. The monetary dimension of the policy is the cost that can be high or low. Any policy can be implemented at a low cost, but the legislator can arbitrarily decide to set a high cost that generates a private benefit for himself. On the other hand, the ideological dimension is not pliable since policy motivated legislators cannot commit to choose an ideological stance different from their most preferred one. The cost of the policy is paid through non-distortionary taxation by all the citizens who differ in the weight they attach to ideology and cost. Citizens that care more about ideology are defined as *ideology oriented* as opposed to the *efficiency oriented* ones who care more about the cost. All the ideology oriented citizens who are located to the left and right of the median voter belong respectively to the left and right party. Hence parties are subsets of the population grouping ideology oriented citizens,[5] whose main function is the selection of candidates for the electoral race. In the candidate selection process each median party member puts forward one nominee that, if appointed for office, can serve for a limited number of mandates before returning to the status of ordinary citizen. Once in office, a legislator chooses the public policy and if selects a high cost policy to extract private benefits, he hurts the interests of the citizens and provokes the defeat of his own party in future elections. Hence party members, whose primary goal is the long term control of the ideological dimension of the policy, will try to put forward candidates that, being accountable to the electorate, enhance the electoral prospects of future party's candidates. In particular, since policy motivated incumbents care more about the election of their future party's candidates the bigger their ideological distance from the candidate of the opponent party (i.e. the bigger the polarization of the political race), parties can choose the appropriate degree of polarization to control the behavior of the incumbent legislator. The main insight from our analysis is that some degree of party polarization on ideological issues is necessary to obtain accountability on non-ideological stances, because candidates may be disciplined only when they face the threat of political rivals with substan-

[5]There is a vast literature pointing out that party activists are mainly motivated by ideological goals. See, for example, Wilson (1962), Wildavsky (1965), Soule and Clarke (1970), Aldrich (1995), Fiorina et al. (2005).

tially different political agendas. Divergent policy platforms represent a powerful instrument to provide incentives to short-lived candidates because incumbent legislators are willing to give up private benefits from office in exchange for ideological continuity of future policies they care for. As a consequence, in equilibrium parties may optimally choose non-convergent locations in order to obtain incumbent's accountability and long term control over policies. Accountability on monetary stances is, however, costly for the median voter who must trade trade-off "ideology" (his most preferred ideological stance) in exchange of "efficiency" (low cost policy). The characterization of a political equilibrium with electoral accountability shows that the optimal ideological positioning of parties depends in a crucial way on the distribution of policy preferences (over the entire population and within parties). In particular, when the two median party members have ideological preferences that are sufficiently distant from the median voter, we obtain non-convergent locations where either a median party member or a more moderate candidate (different from the median voter) runs for elections and chooses a low cost policy. When median party members are very close to the median voter, then accountability can again be achieved through delegation to a more extreme candidate. However, if the distribution of preferences inside a party is very skewed toward the median voter, then strategic delegation to a more extreme candidate is not an optimal choice for median party members. In this case, convergence prevails and electoral accountability is inevitably compromised. Hence, we conclude that ideological parties, choosing the appropriate degree of candidates' polarization, may guarantee electoral accountability. However, when accountability calls for strategic delegation to more extreme candidates, and policy preferences inside parties are too polarized, then convergence may be an inevitable outcome that turns out to be "bad" for accountability purposes.

The incentive problem faced by parties selecting candidates is very similar to the one encountered by firms hiring workers (Mattozzi and Merlo 2005).[6] Differently from firms, however, parties are confronted with voters who use re-election rules limiting the range of policy-contingent rewards that can be provided to incumbent legislators. Furthermore, parties typically aim at the implementation of some long term ideological goal. As a consequence, despite the similarity between parties and firms, the very different nature of the political competition entails substantial differences in terms of candidates selection matters. In our set up, parties are "prin-

[6]Mattozzi and Merlo (2005) propose a dynamic equilibrium model where a political sector actually competes with a market sector to hire politicians.

cipled organization", whose members share a concern for the provision of a public policy. As shown by Besley and Ghatak (2005), non-monetary incentives may play a fundamental role in mission oriented organizations that employ motivated agents.[7] In our model this is also the case and, in a more extreme set up where those organizations *cannot* use monetary incentives, motivated agents are even willing to forgo private benefits they can obtain from office to foster the ideological goals of their party. Parties, however, represent a very peculiar type of mission oriented organization, since the actions of their candidates are subject to electoral scrutiny, and the continuity of their mission relies on the re-election of their candidates. Hence, median party members may be willing to compromise on their mission (ideology), choosing either more extreme or more moderate candidates, when this is necessary to obtain long term electoral success. Our view of parties as long-lived organizations providing incentives to short-lived candidates is also in many ways analogous to the notion of firms as long-lasting organizations employing short-term workers. In the spirit of this literature, cooperation of short-term agents can be enforced when the game is repeated.[8] In our model, incumbents that cannot re-run for office are similar to old member of organizations about to retire as in Cremer (1986). However, contrary to Cremer (1986) we do not need overlapping generations, since in our model the cooperation of an incumbent in his last term[9] is possible because, after he leaves office, his own interests as a citizen will be still linked to the interest of the party through the ideological dimension of the policy.

This paper is also related to several streams of literature on delegation, accountability and political parties. The delegation problem in political games as been widely studied by agency models of political competition (Banks and Sundaram (1998), Persson et al. (1997), Coate and Morris (1995)). However, those models, considering a representative voter, typically do not address the issue of heterogenous policy preferences and party competition in the delegation problem. The introduction of heterogeneous agents and parties with their own internal process of candidates selection is the main contributions of this paper, that identifies precisely in the candidate choice the major mechanism by which parties, as long-lived institutions, can provide incentives to short-lived candidates. In this sense, this paper relates to Alesina and Spear (1988)

[7] For an overview of the literature stressing the importance of non-pecuniary incentives see Besley and Ghatak (2005).

[8] For a survey on the repeated game literature, see for example Aunmann (1989).

[9] the equivalent of the oldest member of the organization in Cremer (1986).

who show how long-lived parties, making transfers to short-lived candidates,[10] can prevent them from choosing policies detrimental to parties' interests. However, while in Alesina and Spear (1988) the role of parties is to make monetary transfers,[11] in our model the institutional role of a party is only to guarantee the existence of a mechanism of candidate selection ensuring the continuity of an ideological line, and we show that this is sufficient to discipline short-lived politicians. Since in our set up politicians continue to receive the benefit from the policy even after they are no longer public officials, our work is also related to Harrington (1992) where incumbents care about policy after they leave office; however our focus is substantially different, since beside the ideological dimension, we introduce a negotiable dimension on which an agency problem arises.

Our analysis also contributes to the vast literature on party convergence initiated by the seminal work of Downs (1957). The most celebrated result of convergence to the median voter is difficult to reconcile with stylized facts.[12] Hence, several theoretical explanations for party platform divergence have been proposed (Robertson (1976), Wittman (1983), Palfrey (1984), Calvert (1985), Bernhardt and Ingberman (1985), Londregan and Romer (1993), Ingberman and Villani (1993)). In particular, in a stochastic environment where there is uncertainty about voters ideal policies, non-convergence to the median voter is possible either because of candidates' policy motivation (Alesina 1988) or because of some other exogenous candidates' characteristic (valence) which affects voting (Ansolabehere and Snyder (2001); Aragones and Palfrey (2005); Groseclose (2001); Schofield (2007)). In our model we show that when candidates choose a multidimensional policy, non-convergence may also arise in a perfect information setting.[13] Furthermore, we show that non-convergence is necessary to obtain electoral accountability. Importantly - and contrary the case of unidimensional policies - we show that when the policy is multidimensional, party polarization is not necessarily "bad" for the median voter. Quite to the contrary, in our model we find that in fact the median voter may prefer some degree of party polarization on the fixed ideological dimension of the policy when this leads to accountability on another negotiable dimension. Hence, our model on the one hand provides

[10] Those transfers can be either pension payments or, most often, career paths inside the administration associated with high monetary reward. In other words, candidates loyal to the party are rewarded with positions ensuring high monetary returns when they leave office.

[11] Besley (2004), Messner and Polborn (2004) Caselli and Morelli (2004) also analyze the effect of monetary incentives on politicians performance and candidates selection.

[12] For an overview of the theoretical and empirical literature on party divergence see Schofield (2007).

[13] Note that in our setting, differently, from the models of political valence, the second policy dimension is not an exogenous characteristic but a choice variable that affects elections.

a further explanation for the recognized non-convergence paradox, on the other it shows that some degree of party differentiation on ideological issues may be desirable as long as this brings accountability on non-ideological stances. In this way our works builds a bridge between agency models of political competition and the literature on party competition, showing how parties competing for elections may help voters to obtain accountable legislators.

The remainder of the paper is organized as follows. In section 2 we outline the model. In section 3 we discuss the main assumptions and we present an intuitive argument for the proof of the main results. In section 4 we characterize an equilibrium policy choice with accountable legislators. In section 5 we derive the main results on equilibrium party location and electoral accountability. In section 6 we summarize and conclude.

2 The model

2.1 Policy and preferences

The economy consists of infinitely lived citizens that delegate to a legislator the selection of a public policy that is characterized by two dimensions, the ideological dimension x and the cost $\mathcal{C}$. Citizens with heterogenous preferences for the ideological dimension are indexed by their ideology $x \in \Re$. The legislator is a particular citizen g, appointed to make policy choices for a limited number of periods, which becomes again an ordinary citizen when his mandate expires[14]. For simplicity, and without loss of generality, we assume that the legislator can serve only one mandate.[15] Legislators are policy motivated, i.e. they cannot commit to choose $x \neq g$. Let $|x-g|$ be the *ideological distance* between a generic individual citizen x and a legislator g. We assume that citizens' preferences for the the ideological dimension are such that when g is in power they suffer an ideological loss equal to $-|x-g|$. Given the single peackdeness of preferences, citizens can be ranked on a continuum according to their most preferred type x with $x = m$ being the median of their distribution. For simplicity we assume that $m = 0$, so that the set of citizens to the left and right of the median voter will respectively be $L = \Re^{-}$ and

[14] This assumption reflects the idea that that elected officials know the date of their last mandate because of term limits or retirement age. Note however that as elections and policy choices go far beyond the last mandate of elected politicians, citizens face uncertainty about the last period where they will vote and benefit from the policy will implemented. Or put it differently, their time horizon is infinite. We will discuss later in the paper the relevance of this assumption.

[15] The results of the model hold for any finite number of mandates.

$R = \Re^{+}$. In figures 1-2 we report some examples of distributions of ideological policy preferences that will be used later on to illustrate our main results.

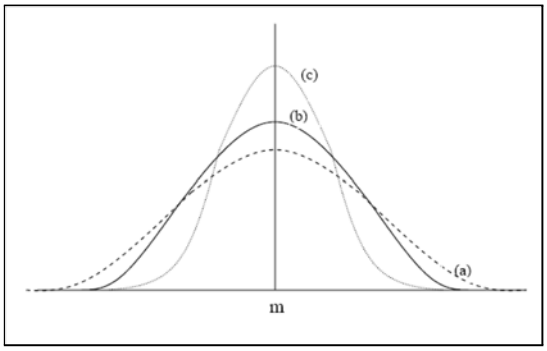

Figure 1: symmetric distributions

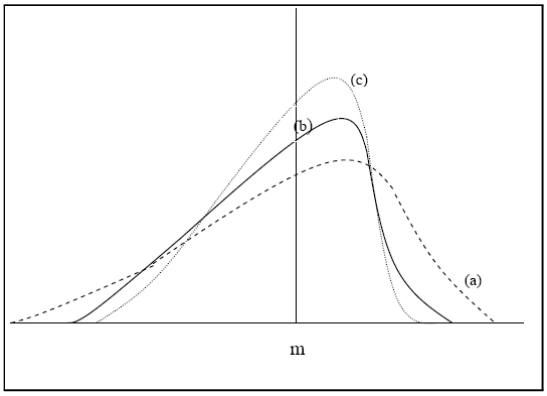

Figure 2: asymmetric distributions

The total cost $\mathcal{C}$ is shared among all citizens that pay a per capita cost $C \in \left\{C^L, C^H\right\}$, with $C^H > C^L = 0$. The policy can always be implemented at a low cost (C^L) but the legislator, who receives a private benefit $B(C)$ increasing in its argument C, has complete discretion on which cost to choose. For simplicity we assume that $B\left(C^L\right) = 0$ and $B\left(C^H\right) = B > C^H$. Assuming that citizens also care differently about the ideological loss to which they attach a weight $\alpha \in \{\alpha^L, \alpha^H\}$ where $\alpha^H > 1 > \alpha^L > 0$, the one period utility of a citizen x and a legislator g, denoted by $v_x(C, g)$ and $v_g(C, g)$, are the following:

$$v_x(C, g) = -\alpha |x - g| - C \tag{1}$$

$$v_g(C, g) = B(C) - C \tag{2}$$

The weight α expresses the extent of the ideological leaning of citizens. Note that when $\alpha = \alpha^H > 1$, citizens attach an higher weight to the ideological loss $|x - g|$ than to the cost

dimension C. In this case we say that they are *ideology oriented.* On the other hand, when they value more the cost than the ideological loss (i.e. $\alpha = \alpha^L$) we define them as *efficiency oriented.*

We also assume that ideology oriented citizens to the left and to the right of the median voter respectively belong to a *left* and *right* party[16] denoted respectively by l and r. Hence, a party is a subset of the population that comprises all the citizens to the left (right) of the median voter who are ideology oriented.[17] Parties serve the function of selecting candidates for the political race. We suppose that the mechanism of candidate selection is democratic and the median party members, denoted by m_l and m_r, choose the party candidate.[18] Note that, ideology oriented citizens dominate political parties and this may cast doubts on the ability of parties to promote voters' interests on the wider policy spectrum. Hence, it is important to understand if the ideological leaning of parties may actually compromise their ability to select candidates serving the electorate's general interests. As we will show, this is not the case in our model, since parties, because of strategic considerations, also influence the cost dimension that they value less than the cost.[19]

2.2 Players and strategies

The players of the political game are the two median party members selecting the two candidates for the electoral race, the median voter who appoints the legislator and the policy maker that during his mandate chooses the public policy. The timing of the game is as follows. In $t = 0$ the median voter announces his voting rule and the two median party members simultaneously

[16] We assume the existence of parties. In other words, this is not a model of *party formation* but a more simple model of *party strategy.* Once formed parties are relatively stable institutions that can generate diverse candidate locations due to their internal democratic processes. Therefore, the focus of this paper is precisely on the effects of these internal mechanism of candidate selection on final policy outcomes. For recent contributions on party formation, see Levy (2004) and Morelli (2004).

[17] The results of the model will hold if we assume that parties include a fraction of ideology oriented citizens and a fraction of efficiency oriented, as long as ideology oriented types are the majority within the party. Since it is widely recognized that party activists tend to be more "ideological" than the rest of the population it seems natural to assume that the majority of party members are ideological, and for the sake of simplicity, and without loss of generality, we assume that all party members are ideological.

[18] This is a very stylized representation of a democratic process of candidate selection inside the party. The logic of the model will go through if the candidate selection will be made by some other party member because of a different allocation of voting right inside the party in the nomination process.

[19] For the sake of conciseness, we present the general results obtained when median party members care both about ideology and cost. However, a political equilibrium with accountability is obtained also in the extreme case where median party members care *only* about ideology. The full characterization is available from the author upon request.

announce their nominees knowing that one of them will be selected to become the first legislator. We denote by $\gamma_{m_l}(L)$ and $\gamma_{m_r}(R)$ the strategies of the two median party members prescribing at the beginning of the game the selection of a candidate from the sets L and R. Hence, the median party member of the left (right) party can select any ideology or efficiency oriented left (right) wing individual as a candidate. The selection of candidates happens once and for ever during $t = 0$, before the first election.[20] As we consider a stationary environment, once party members choose optimally their candidates in the first period, they will not find it optimal to change this choice later on, even if they are allowed to re-select their candidates. Hence, under stationarity with no loss of generality, we carry on our analysis with candidate selection in the first stage only. This means that in $t = 0$ median party members decide the ideological position of all future party's candidates. Hence, even if a legislator can stay in power for one period only, given the candidate selection process, he will always be replaced by a candidate with identical ideological preferences in any future electoral race.

The appointed legislator takes office at the beginning of $t = 1$, chooses a policy and later on elections are called. At the end of $t = 1$ the first election takes place and the median voter decides whether to appoint the candidate of the incumbent's party or replace him with the opponent. The winner of the electoral competition becomes the new legislator, who will choose the policy in period $t = 2$. Then again at the end of period $t = 2$ a new election will take place and the elected legislator chooses the policy in period $t = 3$ and so on. More formally, in each period $t \geq 1$ we have a *policy choice* followed by an *election*. This is the *stage game* repeated for t periods. The players of this infinitely repeated game are the median voter and the legislator who observe each others' actions at the end of each period t. The action space for the median voter is the set of all possible voting decisions that consists in voting for the candidate of the incumbent's party or voting for the opponent, and the action space for the legislator is the set of all possible policy choices $p_C = (g, C)$, with $C \in \{C^L, C^H\}$. Then for each player, we can define a strategy that in each period maps all possible histories of the game into actions. More formally, let g^t be a legislator with ideology g in place in period t. At the end of period t an election takes place where the nominee of the incumbent party with ideology g runs against the challenger of the opponent party with ideology $g' \neq g$. Denoting by H^{t-1}

[20] The fact that the candidate choice happens in period $t = 0$ only means that in the future the candidates will have the ideological position intially chosen, not that they will be the same individuals. The selection of the type in $t = 0$, can be interpreted as a stylized party constitution step where party members choose a given ideological line.

the set of all possible histories[21] up to period t, we define $\sigma_g^m : (H^{t-1}) \rightarrow \{0,1\}$ the median voter's voting strategy that in every period t prescribes whether to elect or not the candidate of the incumbent legislator's party with ideology g, where $\sigma_g^m = 1$ means that the candidate with ideology g is elected by m and $\sigma_g^m = 0$ means that the candidate with ideology g is replaced by the opponent. Similarly, we denote $\pi_{g^t} : H^{t-1} \rightarrow p_C^t$ the legislator's strategy that in period t prescribes a policy $p_C^t = (g, C)$.

The outcome of the game induced by the previously defined strategies is a sequence of policies p_C^t chosen by legislators g^t. Let $v_x(p_C^t)$ be the one period payoff of individual x associated to the policy outcome p_C^t induced by the strategies $\left(\gamma_{m_l}(.), \gamma_{m_r}(.), \sigma_g^m(.), \pi_{g^t}(.)\right)$. The total intertemporal payoff of each player is the sum of their one period payoffs, where the future is discounted according to $\delta < 1$. Let's denote $V_x^t(.)$ the intertemporal payoff in period t of the generic player x which can be written in the following form:

$$V_x^t\left(\gamma_{m_l}(.), \gamma_{m_r}(.), \sigma_g^m(.), \pi_{g^t}(.)\right) = \sum_{t=0}^{\infty} \delta^\tau v_x\left(p_C^\tau\right)$$

We are now ready to define the equilibrium of the game. First, median party members must choose optimally candidates:

Definition 1 *An equilibrium candidate location is a pair of candidates that are best responses to each other, given any strategy profile* $(\sigma_g^m(.), \pi_{g^t}(.))$*;*

Note that although the candidate choice happens in $t = 0$, we require subgame-perfection since the candidate choice must be optimal given any future strategy profile.

With the further requirement that the voting and policy strategies satisfy sub-game perfection, the equilibrium of the political game is defined as follows:

Definition 2 *A political equilibrium consists of the following elements:*

(a) an equilibrium candidate location, given a profile $\left(\sigma_g^{m*}(.), \pi_{g^t}^*(.)\right)$ *of equilibrium voting strategy and policy choice;*

(b) a voting decision $\sigma_g^{m*}(.)$ *and a policy choice* $\pi_{g^t}^*(.)$ *that are sub-game perfect.*

[21] A history consists in a sequence of candidates, past policy choices and past electoral outcomes up to the period t observed by all players.

3 Policy preferences, political salience and convergence

In our model, median party members select candidates, while the median voter determines the result of the election. The median voter unambiguously prefers a low cost policy to an high cost policy and his most preferred policy is $p_{C^L} = \left(m, C^L\right)$. On the other hand, median party members, who are more ideological, are particularly concerned about having their most preferred ideology implemented for ever. However, to achieve this goal, they need the support of the median voter. Hence the question arises of whether parties will have to please the median voter, offering him his most preferred ideological location m in order to win the election, or if they can win even choosing divergent platforms. In a standard Downsian framework, where parties only aim at winning elections, convergence will occur. However, in our setting, where party members also care for policies, not only convergence is avoidable, but indeed it might not even be desirable from the perspective of the median voter. Multidimensionality and policy motivation are crucial to explain why convergence may not be the most preferred option neither for parties nor for the median voter. As we will formally show later, when parties converge to the median voter on the ideological stance, accountability of candidates on the monetary dimension of the policy is inevitably compromised. On the other hand, accountability can be obtained if candidates are sufficiently far apart on the ideological issue. Hence, the median voter may prefer a non-convergent ideological location with accountability to a convergent location without accountability.

We can provide a simple intuition for how we can obtain a political equilibrium with accountable legislators. An incumbent choosing a high cost policy obtains a private benefit B. Since he can stay in office only for one mandate, he can eventually obtain this private benefit for one period only. While in office, he also chooses his most preferred ideology, thereby obtaining a maximum "ideological" benefit . Furthermore, after his mandate expires, he can still obtain a maximum ideological benefit, provided that his party's nominee (whose ideological preferences are the same of the incumbent) will win elections. Therefore, we can note here a striking difference between the *private benefit* from the policy and the *ideological benefit*. A candidate can enjoy private benefits only during the political mandate he can serve, while he receives the ideological benefit (loss) for the rest of his life after he leaves office, and this benefit will be maximum if a legislator of his own party will be in office. Clearly, if the opposing party wins the election, then the incumbent will suffer an *ideological loss* that will be higher, the bigger the ideological distance between the candidates of the two parties. Because of this ideological

loss, an incumbent whose political mandate cannot be renewed, may still have an interest to enhance the future electoral prospect of his own party. Hence, he may be willing to give up the private benefit from the policy to guarantee the electoral success of his party's nominees in future elections. As the ideological loss depends on the distance between the candidates of the two parties, i.e. the polarization of the political race, we can immediately note that if the two parties would converge to the median voter m, then an incumbent will never suffer an ideological loss being replaced by an "identical" challenger. Therefore, if a political equilibrium with accountable legislators exists, in this equilibrium parties must *not* converge to the median voter. This simple argument shows how convergence compromising accountability can harm the median voter.

It is important to point out that non-convergent equilibria with accountable candidates can occur in our model when the median voter can credibly reward (punish) with election (no election) the candidate of the incumbent's party that has chosen the low cost (high cost). Hence, to obtain accountability it is essential that the cost of the policy is politically salient.[22] Provided that the cost is salient, the possibility to discipline an incumbent on the monetary dimension of the policy relies on two factors: (a) the existence of a credible *reward/punishment mechanism (voting rule)* and (b) the size of the *ideological loss*.

In the next sections we will formally characterize the political equilibrium. First, we will show that the median voter can discipline the incumbent using a simple credible reward/punishment voting rule. Then, we will show that there are cases where parties find optimal to choose candidates sufficiently far apart from the median voter in order to obtain accountability on the monetary dimension of the policy. As convergence inevitably compromises accountability, the polarization of the political race turns out to be essential for electoral discipline.

[22] Formally, the cost of the policy is politically salient when the following holds: $\alpha |m - g| + C^L \leq C^H$. In words, the inequality says that the median voter m prefers a legislator $g \neq m$ choosing the C^L to a legislator $g = m$ choosing C^H. Note that, with a continuum of types, there is always a candidate $g \neq m$ but close enough to m, so that the previous inequality holds. However, this candidate g needs not to be the median party member.

4 Voting rule and policy choice

At the beginning of the game one of the two parties' nominee is exogenously selected to become the first legislator. Without loss of generality from now on we suppose that the first incumbent legislator is a citizen with ideology $g \in L$ nominated by m_l, while the challenger nominated by m_r has ideology $g' \in R$. As all future nominees of a party share the same ideological preferences, for simplicity we will call *"incumbent type"* all future nominees of the current incumbent's party.

In period t the incumbent legislator g^t chooses the policy $p_C^t = (g, C)$ maximizing his total intertemporal payoff and then he resigns. Notice though that, if in the subsequent election his party's nominee is elected, he will obtain his most preferred ideological stance g even if he is no longer in office. Hence, the appointment of the incumbent's party nominee is *de facto* a "reward" for the past incumbent's policy choice, and the replacement with the challenger a "punishment". Therefore, the median voter can use his voting strategy to reward or punish the incumbent for his decision on the cost dimension. However, since the policy is multidimensional, a reward/punishment scheme contingent on the cost is not necessarily optimal when the incumbent has ideological preferences different from the median voter. For example, if the median voter is closer to the challenger than to the incumbent on ideological grounds, then on the one hand he may want to reward the incumbent's party nominee to obtain the low cost policy, on the other he may be tempted to replace him with a challenger with closer ideological preferences. Since punishments and rewards may be costly to carry on we need to verify that they are credible, or put it differently, sub-game perfect.

Suppose that the median voter m adopts the following simple reward/punishment strategy denoted by $\sigma_g^{m*}(.)$ prescribing the following actions: "*In any election vote for the candidate with ideology $g \in L$ if every past incumbent with same ideology has chosen the low cost policy, and never elect $g \in L$ if any past incumbent with same ideology has chosen the high cost policy*". We have to prove that the punishment and reward are sub-game perfect. The difficulty in proving sub-game perfection comes from the fact that the policy is multidimensional. Once the incumbent has delivered the low (high) cost policy, the median voter may be tempted to vote for the candidate he prefers on ideological grounds, independently of the incumbent's choice on the cost dimension. However, rewarding or punishing an incumbent independently of his good or poor performance on the cost dimension will imply that no future candidate will ever have an incentive to deliver the low cost policy. Hence, we can show that under appropriate

parametric restrictions, the voter will prefer to carry on his reward (punishment) even if this will imply a "cost" in terms of ideology, rather than obtaining an ideological benefit from a candidate closer to himself, and compromising accountability for ever.

The next lemma states the condition for an incumbent candidate to be accountable on the monetary dimension of the policy, given the above defined simple reward/punishment voting rule $\sigma_g^{m*}(.)$. Given two candidates with ideology $g \in L$ and $g' \in R$, and the conjectured voting strategy $\sigma_g^{m*}(.)$, the following holds:

Lemma 1 *In period t the incumbent legislator g^t will choose the policy $p_{C^L}^t = \left(g, C^L\right)$ if and only if $|g - g'| \geq \frac{B+\delta C^H}{\alpha\delta}$.*

Proof. See Appendix.

Intuitively, the lemma says that if the political race is sufficiently polarized, i.e. $|g - g'| \geq \frac{B+\delta C^H}{\alpha\delta}$, then the incumbent g^t prefers choosing the low cost policy expecting the future nominees of his party to be rewarded with reelection, rather than collecting the one period private benefit and harm the future of his party's candidates. We define "accountability threshold" , denoted by $A = \frac{B+\delta C^H}{\alpha\delta}$, the minimum distance between g and g' that, according to the previous lemma induces g^t to choose $p_{C^L}^t$.

The next lemma states the condition for the conjectured voting strategy $\sigma_g^{m*}(.)$ to be an equilibrium voting strategy:

Lemma 2 *Given two candidates with ideology $g \in L$ and $g' \in R$, assume that the cost is politically salient and $|g - g'| \geq A$. The conjectured voting strategy $\sigma_g^{m*}(.)$ is an equilibrium voting strategy.*

Proof. See appendix

Intuitively, when the conjectured strategy implies an equilibrium where the incumbent g^t is accountable in every period, for the voter it is optimal to vote accordingly since if he does not, in any future period accountability will be lost. Clearly this is not the unique reward/punishment scheme that can ensure the selection of a low cost policy. Nonetheless, we focused on a simple retrospective voting rule[23] that has the advantage of being plausible since there is substantial empirical evidence of retrospective voting behavior in real world elections (Fiorina 1981).

[23]For a pioneering theoretical contribution on retrospective voting widely used in the political economy literature see Ferejohn (1986).

Note also that the fact that the game is infinitely repeated is important to obtain the accountability result. If the game had a final period, in any asymmetric candidate location scenario the incumbent will choose not to be accountable in the last mandate and, therefore, by backward induction, it can be can easily shown that the voter could not credibly reward the incumbent for choosing the low cost policy even if the cost is salient.[24]

5 Party location and accountability

We are now ready to show how parties can choose accountable candidates, given the credible reward/punishment voting rule illustrated in the previous section. First, we prove that median party members strictly prefer to put forward ideology oriented candidates, (i.e. party members which by definition are characterized by $\alpha^H > 1$) to efficiency oriented ones with the same ideological preferences:

Lemma 3 *Given any two possible candidates with the same ideology g, the ideology oriented candidate is strictly preferred to the efficiency oriented candidate .*

Proof. The two candidates deliver the same ideology g, but for the same degree of polarization of the political race, the ideology oriented is more likely to be re-elected because the accountability threshold for an ideology oriented candidate is $A_{\min} = \frac{B+\delta C^H}{\alpha^H \delta}$ that is strictly smaller than the threshold for an efficiency oriented candidate $A_{\max} = \frac{B+\delta C^H}{\alpha^L \delta}$ ■

Intuitively, an ideology oriented candidate is more likely to be accountable and, therefore, to enhance the electoral prospects of his party, because he attaches a bigger weight to the ideological benefit from the reelection of his party's nominee.

We are now ready to state one of the main results of the model.

[24] Consider the following pair of candidates $g' = m$ and $g \neq m$ satisfying $|g - g'| \geq A$. Proceeding backward, in the final period t, because no future election will be called, any legislator g^t would choose the high cost policy. If this is the case, an incumbent legislator in period $t-1$, knows that the median voter will never "reward" him for choosing the low cost policy since he will certainly prefer the challenger m choosing C^H to the successor $g^t \neq m$ choosing C^H. As a consequence, the incumbent in $t-1$ will choose C^H. Hence, proceeding backward we can conclude that the policy C^H is the equilibrium policy in every period $t \geq 1$. The same argument applies for any asymmetric candidate location where the opponent is closer to the median voter than the incumbent. On the other hand, if the incumbent is closer to the median voter than the opponent, then again the incumbent knows that he will win the last election even if he has chosen the high cost policy. Therefore, by backward induction he will never choose the low cost policy. Hence, when the game is finite, there is no asymmetric candidate location where an equilibrium with accountability can be obtained.

Proposition 1 *If the distance between the median party member m_l and the median voter m is bigger or equal than the accountability threshold $A_{\min} = \frac{B+\delta C^H}{\alpha^H \delta}$, then there exists a sub-game perfect equilibrium where the party l runs with the median party member candidate m_l, that wins the election against any candidate of the opponent party R, and chooses the policy $p^t_{C^L} = \left(m_l, C^L\right)$ in any period $t \geq 1$.*

Proof. See Appendix.

The previous proposition characterizes the political equilibrium highlighting the role of policy preferences. When the distance between the median party member and the median voter is sufficient to induce the incumbent legislator m_l to choose the low cost policy, then the incumbent can be held accountable for any ideological positioning of the challenger. In particular, even if the opposing party would converge to the median voter in his candidate choice, still the median voter will prefer rewarding the other more extreme candidate for his choice of the low cost policy. The distribution (b) in figures 1-2, where the median voter is sufficiently distant from the median party member of the incumbent's party, represent two examples of intermediate polarization of policy preferences that can give rise to the equilibrium location described in *proposition 1.* Note that the polarization of policy preferences in this case has two implications. The median party member m_l will realize his most preferred policy. The median voter m will not receive his most preferred policy on ideological grounds, but he will discipline the incumbent on the monetary dimension of the policy. Hence, in a multidimensional context, even an agency problem arising on non-ideological issues can be solved by party competition provided that parties do not offer the same policy platform. Importantly, this results highlights that party differentiation on ideological issues, which is a characteristics of electoral races often observed in real world elections, may be a desirable property insofar as policy motivated incumbents are more likely to be accountable to the electorate when they face the threat of political rivals with substantially different ideological agendas. In other words, while party polarization is certainly costly for the median voter as many suggest, it may still bring other benefits that, on the one hand justify why polarized platforms exists, on the other cast a different light on the much criticized role of ideological partizans.

Another fundamental message of our analysis is that the long term ideological mission of parties and the party loyalty of candidates are key to obtain accountable legislators. In fact, even if candidates are short-lived (i.e. they cannot stay in place for ever), still because they are policy motivated on the ideological dimension, they can be loyal to the party because the

optimal ideological party line ensures that a candidate with their preferences will be in place in the future. Moreover, our analysis shows that although there is a similarity between parties and firms as long-lived organization that try to discipline short-lived agents, still parties are long-lived institutions with a peculiar characteristic. As they determine the ideological dimension of the policy, which is a non-monetary benefit that former candidates receive even after they leave office, then parties may be able to obtain cooperation from policy motivated incumbents, even when their mandate cannot be renewed, provided that the future ideological benefit from cooperation is bigger than the current private benefit sacrifice. Hence, parties, as long lived mission-oriented organizations, can induce politicians to forgo private benefits, even when their "working life" within the organization is short.

5.1 Strategic delegation

In this section we extend our analysis to consider the cases where median party members - who cannot win election by running as candidates - may use strategic delegation to some alternative candidate to achieve their goals. We begin our analysis considering the case where the ideological distance between the median party member of the incumbent party and the median voter is not sufficient to guarantee accountability, should the median party member m_l run for elections. In figures 1-2, this case corresponds to the distribution (c).

Before laying out our second proposition, we need to introduce some further notation. Let $L_c = (m_l, m]$ and $L_e = (-\infty, m_l)$ be the set of candidates with ideology $g \in L$ who are respectively more centrist and more extreme than the median party member m_l. Similarly, let $R_c = [m, m_r)$ and $R_e = (m_r, \infty)$ be respectively the set of candidates $g' \in R$ more centrist and more extreme than the median party member m_r. Given L_e, let $e \in L_e$ be the closest candidate to m_l such that such that $\mid e - m_l \mid \geq A_{\min}$ and let us define the following threshold level for the discount rate, $\delta_g = \frac{|m_l - g|}{|m_l - g'|}$. We are now ready to state our second proposition. Suppose that the distance between the median party member m_l and the median voter m is strictly smaller than the accountability threshold $A_{\min}$, while the distance between m_l and e is bigger than the accountability threshold $A_{\min}$. The following holds:

Proposition 2 *i) when the median party member m_l is closer to the extreme candidate e than to the median voter m and $\delta < \delta_e$, there exists a sub-game perfect equilibrium where the incumbent is accountable to voters. In this equilibrium the party l runs with the extreme*

candidate e and the opponent party r runs with the median voter m. The candidate of the incumbent party, e, chooses the low cost policy $p^t_{C^L} = \left(e, C^L\right)$ and wins the elections in every period $t \geq 1$.

ii) When m_l is closer to m than to e there exists no sub-game perfect equilibrium where the incumbent is accountable to voters.

Proof. See Appendix.

Intuitively, the first half of the proposition states that if the distance between the median party member of the incumbent party, m_l, and the median voter, m, is not sufficient to guarantee accountability, but the distance between the median party member of the incumbent's party, m_l, and the median party member of the opponent party m_r is sufficient for accountability, then the first incumbent's party can choose a candidate *more extreme* than the median party member in order to obtain an incumbent choosing the low cost policy. We prove this result by iterated elimination of dominated strategies, considering any possible candidate location. We find that the only candidate location surviving iterated deletion of dominated strategy is the pair $\{g = e, g' = m\}$. This means that, when the opposing party locates on the median voter m, the incumbent party responds with a more extreme location, which ensures both accountability and electoral success. However, delegation to a more extreme candidate is an optimal strategy provided that the median party member is closer to the first extreme candidate who guarantees accountability than to the median voter m. In fact, while the strategic delegation to a more extreme candidate implies reelection, the median voter m_l also faces an ideological loss from choosing a more extreme candidate than himself. Clearly, if the median party member is closer to the median voter than to the extreme candidate, than for him it is better to lose the election and have a median opponent in place than to win the election with an extreme candidate. In fact, the limits of strategic delegation as a tool to obtain accountability are illustrated in the second part of the proposition showing that median party members do not always find it optimal to strategically delegate the policy choice to a more extreme candidate in order to achieve electoral accountability.[25] Interestingly, this proposition shows that the distribution of

[25] The complete characterization of the equilibrium locations and policy choices is reported in the appendix where we prove that if m_L is closer to m than to e two cases arise. If $\delta > \delta_{_g}$ for every $g \in L_C$, party l runs the median party member m_L, party R runs the most extreme candidate in R_C. The incumbent m_L chooses the high cost policy and loses the elections in every period $t \geq 1$. On the other hand, if $\delta_{_g} < \delta < \delta_m$ for every $g \in L_C$, party L runs $g = m$, party R runs $g' = m$. The two candidates $g = m$ and $g' = m$ alternate in office choosing the high cost policy in every period $t \geq 1$.

preferences within the party is crucial. If the distribution is very skewed toward the median voter so that only a very extreme candidate could ensure accountability, then parties cannot help voters to obtain accountable candidates. On the other hand, if the distribution is too skewed toward the extreme side, it may also be the case that the median voter is not willing to vote for a median party member who, although accountable, has ideological preferences that are too distant from the median. In the last proposition we characterize the equilibrium party location in this particular case that can be represented by the distribution (a) in figures 1-2.

Formally, assume that $\alpha |m - m_l| + C^L > C^H$ but there exist a more centrist candidate $g \in (m_l, m)$ such that $\alpha |m - g| + C^L \leq C^H$. Let $c \in L_C$ be closest candidate to m_l such that $\alpha |m - c| + C^L \leq C^H$ and let $\delta_C = \frac{|m_l - c|}{|m_l - g'|}$. Given this distribution of preferences, the following holds:

Proposition 3 *If the distance between the centrist candidate c and the median voter m is bigger or equal than the accountability threshold $A_{\min}$ and $\delta < \delta_C$, then there exists a sub-game perfect equilibrium where party L runs c which chooses the low cost policy $p^t_{C^L}$ and beats any opponent in every period $t \geq 1$.*

Proof. See Appendix.

Intuitively the proposition says that if the median party member m_l is "too far" from the median voter m, and there is a more centrist candidate c different from m that can guarantee accountability, then the median party member prefers to delegate to the less extreme candidate. It is also trivial to show that when δ does not satisfy the restriction required in *proposition 3*, we obtain the same candidate locations described in *proposition 2* (proof in appendix). Hence, in general the polarization of the electoral race turns out to be a compromise between ideological stances of median party members and electoral goals, and the distribution of policy preference across the entire citizenry and inside parties have important implications for the equilibrium policy platforms and electoral accountability.

6 Conclusions

Parties are associations of citizens that play a fundamental role in representative democracies. They are the primary actor of the electoral competition since they choose the candidates of the political race. Furthermore, choosing candidates, parties may influence policies. Clearly, how

parties can actually affect policies through the selection of candidates crucially depends on the candidates' preferences and on the relationship between parties and candidates.

We have proposed a two-dimensional policy setting where candidates, who are policy motivated on an ideological stance but not on a monetary dimension, share an ideological goal with parties. However, a candidate appointed for office can also choose a policy which generates a private benefit from himself and a loss for both his party and the median voter. Within this context, we have shown how parties can solve this accountability problem.

The role of parties as a long-lived institutions is to ensure the selection of a precise type of candidate in the ideological spectrum, i.e. the implementation of a given ideology. Hence, even if candidates are short-lived as they cannot stay in place for ever, still because they are policy motivated on the ideological dimension of the policy, they can be loyal to the party to guarantee the electoral success of his parties nominees sharing his same ideological goals. However, party loyalty is costly for incumbent legislators, because to enhance the reelection of future nominees of their own party they have to forgo private benefits. Hence, an incumbent legislator is willing to give up current private benefits for future ideology provided that the ideological gain is bigger than the private benefit loss. The ideological gain depends on the ideological distance between the incumbent legislator and the challenger of the opponent party. The bigger the distance, the higher the loss from an electoral defeat. As a consequence, parties can use strategically the polarization of the political race to provide incentives to candidates. The strategic use of party polarization implies a complex relationship between polarization of preferences and the polarization of the political race, whereby the optimal positioning of parties in the ideological spectrum turns out to be a compromise between policy preferences of party members and electoral goals. Furthermore, party convergence to the median voter is always "bad" for accountability, as ideologically identical candidates do not have incentives to reject private benefits. Hence, party polarization can guarantee electoral accountability, but accountability itself is costly for the median voter who must accept a more extreme incumbent on non-pliable ideological grounds to obtain a better outcome on another policy issue on which a commitment is possible.

As a final remark, political parties are complex institutions with different types of decision making processes. Although they are undoubtedly amongst the most important institutions in representative democracies, the literature on internal party organization and their decision-making process is surprisingly thin. In this paper we have shown that the way parties choose

candidates may ultimately have important consequences in terms of policy outcomes, and to this end we analyzed a simple, stylized democratic process of candidate selection. However, parties are regulated by internal constitutions that allocate different voting rights to party members, and they also face substantial differences in the electoral rules governing the type of instruments they can use to campaign. The interaction between these two dimensions (together with the polarization of preferences of citizens and party members) may have a profound effect on parties' candidates choices, as well as on policy outcomes. While these are clearly very important questions, we leave them for further research.

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Appendix

A Proof of Lemma 1

We prove the lemma for the first incumbent g^1, then given the stationarity of the environment, the proof holds for any g^t , $t \geq 1$. Let g^1 be the first incumbent with ideology $g \in L$ and suppose that the challenger has ideology $g' \in R$. Consider the following conjectured voting strategy $\sigma_g^{m*}(.)$: "*In any election vote for the candidate with ideology $g \in L$ if every past incumbent with same ideology has chosen the low cost policy, and never elect $g \in L$ if any past incumbent with same ideology has chosen the high cost policy*".

Given $\sigma_g^{m*}(.)$, we can compute the expected payoff for g^1 when he chooses $p_C^1 = (g, C)$, with $C \in \{C^L, C^H\}$. Note that, if g^1 chooses $p_{C^H}^1 = \left(g, C^H\right)$, given the conjectured voting strategy $\sigma_g^{m*}(.)$, he will be permanently replaced by the opponent choosing $p_C^{t+1} = (g', C)$, with $C \in \{C^L, C^H\}$ $\forall t \geq 1$. Hence, in this case the intertemporal payoff for g^1 is:

$V_{g^1}\left(p_{C^H}^1, \sigma_g^{m*}(.), p_C^{t+1}\right) = B - \sum_{t=1}^{\infty} \delta^t (\alpha |g - g'| + C)$

On the other hand, if g^1 chooses $p_{C^L}^1 = \left(g, C^L\right)$, given that any successive legislator can deviate and choose $p_{C^H}^{t+1} = \left(g, C^H\right)$ at any $t \geq 1$, there is an infinite number of possible path associated to possible deviations in $t \geq 1$. Among all paths, there is one path where the legislator g^1 gets the lowest possible payoff. Therefore, the condition supporting the policy $p_{C^L}^1$ when the legislator obtains his lowest payoff is sufficient to obtain $p_{C^L}^1$ along any other path. The lowest payoff for the incumbent legislator g^1 is realized when he chooses $p_{C^L}^1 = \left(g, C^L\right)$ and his first successor chooses $p_{C^H}^2 = \left(g, C^H\right)$ triggering the electoral defeat that brings to power the opponent who will choose $p_C^{t+2} = (g', C)$ $\forall t \geq 2$. Hence, the lowest payoff for g^1 is:

$\underline{V}_{g^1}\left(p_{C^L}^1, p_{C^H}^2, \sigma_g^{m*}(.), p_C^{t+2}\right) = -\delta C^H - \sum_{t=2}^{\infty} \delta^t (\alpha |g - g'| + C)$

Hence $\underline{V}_{g^1}\left(p_{C^L}^1, p_{C^H}^2, \sigma_g^{m*}(.), p_C^{t+2}\right) \geq V_{g^1}\left(p_{C^H}^1, \sigma_g^{m*}(.), p_C^{t+1}\right)$ if and only if $|g - g'| \geq \frac{B + \delta\left(C^H - C\right)}{\alpha\delta}$, with $C \in \{C^L, C^H\}$.

The minimum ideological distance between the two candidates that makes g^1 choose $p_{C^L}^1$ is $|g - g'| = \frac{B + \delta\left(C^H - C\right)}{\alpha\delta}$ with $C \in \{C^L, C^H\}$. Let $A = \frac{B + \delta\left(C^H - C\right)}{\alpha\delta}$. Note that, depending on the parameters, $\frac{B}{\alpha\delta} \leq A \leq \frac{B + \delta C^H}{\alpha\delta}$, where $A = \frac{B + \delta C^H}{\alpha\delta}$ when $C = C^L = 0$ and $A = \frac{B}{\alpha\delta}$ when $C = C^H$. Therefore, $|g - g'| \geq \frac{B + \delta C^H}{\alpha\delta}$ is necessary and sufficient for g^1 to be accountable when $C = C^L = 0$, while the same condition is sufficient when $C = C^H$. Finally note that, since lemma 1 gives the necessary and sufficient condition for the legislator to be accountable in

$t = 1$, given that the first successor will deviate in $t = 2$, then this condition will be sufficient if deviation will occur at any other date $t > 2$.

B Proof of Lemma 2

Let g^1 be the first incumbent with ideology $g \in L$ and let $g' \in R$ be the ideology of the challenger. To prove the lemma, we consider all the possible candidates locations, i.e. all the asymmetric and symmetric locations with respect to the median voter, $|g - m| \geq |g' - m|$ and $|g - m| < |g' - m|$. First note that when $|g - m| \geq |g' - m|$, then m can credibly punish the incumbent with ideology g, because m weakly prefers any policy $p_C^t = (g', C)$ that can be chosen by the opponent to the policy $p_{C^H}^t = \left(g, C^H\right)$ chosen by the incumbent. Similarly, when $|g - m| < |g' - m|$, then m can credibly reward the incumbent with ideology g, because he strictly prefers the policy $p_{C^L}^t = \left(g, C^L\right)$ chosen by the incumbent to any policy $p_C^t = (g', C)$ that can be chosen by the incumbent.

On the other hand, the sub-game perfection of the reward when $|g - m| \geq |g' - m|$ and of the punishment when $|g - m| < |g' - m|$ only holds when $|g - g'| \geq A$. To show this, suppose that $|g - g'| < A$. In this case, from lemma 1 we know that g^t will always choose $p_{C^H}^t$. Hence, clearly the only sub-game perfect voting strategy is the one that prescribes to elect always the candidate that is closer on ideological grounds. On the other hand, when $|g - g'| \geq A$, the median voter can credibly reward an incumbent even tough $|g - m| \geq |g' - m|$ and can credibly punish him although $|g - m| < |g' - m|$. Hence, suppose that $|g - g'| \geq A$ and assume that C is salient, i.e. given g and g', $p_{C^L}^t$ is strictly preferred to $p_{C^H}^t, \forall g, g'$. To see that the reward is sub-game perfect, note that voting for the incumbent with ideology g, the median voter obtains the policy $p_{C^L}^t = \left(g, C^L\right)$ $\forall t \geq 1$ that, under the assumption of political salience, is strictly preferred to the policy $p_{C^H}^t = \left(g', C^H\right)$ that he would obtain by not carrying on the reward. Similarly, we can show the sub-game perfection of the punishment when $|g - m| < |g' - m|$. By punishing the incumbent g, the median voter can obtain $p_{C^L}^t = \left(g', C^L\right)$ $\forall t \geq 1$ that, from the assumption of political salience, is strictly preferred to $p_{C^H}^t = \left(g, C^H\right)$ that he would obtain if he does not punish the incumbent.

C Proof of Proposition 1

Consider $g \in L$ and $g' \in R$ and suppose $|m - m_l| \geq A_{\min}$ where $A_{\min} = \frac{B+\delta C^H}{\alpha^H \delta}$. Given the assumption that $|m - m_l| \geq A_{\min}$, from lemmata 1-3, we know that the candidate m_l chooses the low cost policy and beats any opponent g' in all future electoral rounds. Therefore, the median party m_l choosing a candidate m_l obtains the maximum ideological payoff (zero) for ever. Suppose now that he chooses a candidate $g \neq m_l$. Given the opponent g', if g wins the elections, the median party member m_l will obtain at most the payoff $V^0_{m_l}\left(m_l, g' \in R, \sigma^{m*}_g(.), \pi^*_{g^t}\right) = -\frac{1}{1-\delta}\alpha^H |m_l - g|$ which is strictly less than the maximum payoff he obtains running the winning candidate m_l. Similarly, if g loses the election against g', the median party member m_l obtains the payoff $V^0_{m_l}\left(m_l, g' \in R, \sigma^{m*}_g(.), \pi^*_{g^t}\right) = -\alpha^H |m_l - g| - \alpha^H \frac{\delta}{1-\delta} |m_l - g'|$ which again is smaller than the maximum payoff. Hence, all candidates $g \neq m_l$ can be eliminated because they are strictly dominated by m_l. On the other hand, the opponent median party member m_r is indifferent amongst all candidate locations since for any candidate $g' \in R$ he will always obtain the payoff $V^0_{m_l}\left(m_l, g' \in R, \sigma^{m*}_g(.), \pi^*_{g^t}\right) = -\frac{1}{1-\delta}\alpha^H |m_l - m_r|$. Hence, the median party member m_l runs the candidate m_l that chooses the policy $p^t_{C^L} = \left(m_l, C^L\right)$ and wins against any candidate $g' \in R$.

D Proof of Proposition 2

Assumption 1: $|m - m_l| < A_{\min}$ with $A_{\min} = \frac{B+\delta C^H}{\alpha^H \delta}$, $|m_l - e| \geq |m - m_l|$ and $\delta < \frac{|m_l - e|}{|m_l - g'|}$

Let $e \in L_e$ be the closest candidate to m_l such that $|m - e| \geq A_{\min}$ and lemmata 1-3 hold. From assumption 1 and lemmata 1-3, the candidate location e strictly dominates any other extreme candidate location $g \in L_e$. Hence by iterated strict dominance we can eliminate any $g \neq e \in L_e$. Let's consider now the remaining candidates' locations, i.e. $g \in [e, m]$ and $g' \in R$. First note that, since any candidate $g \in [m_l, m]$ beats every $g' \in [m_r, +\infty)$, while for any $g \in [m_l, m]$ we can find a $g' \in [m, m_r)$ that beats $g \in [m_l, m)$, then we can conclude that there exists $g' \in (m_r, m]$ that dominates all $g' \in [m_r, +\infty)$. Therefore, once we eliminate $g' \in [m_r, +\infty)$ we are left with the possible equilibrium locations: $g \in [e, m]$ and $g' \in R_c$ where $R_c = [m, m_r)$. The corresponding payoffs are as follows. If the m_l runs against $g' \in R_c$, then m_l will loose elections because none of the candidate will be accountable and m_l is more distant from the median voter then g', i.e. $|m_l - m| > |g' - m| \ \forall \ g' \in R_c$. Hence, by running for

elections, m_l obtains the following payoff:

$V^0_{m_l}\left(m_l, g' \in R_c, \sigma^{m*}_g(.), \pi^*_{g^t}\right) = -\frac{\delta}{1-\delta}\alpha^H |m_l - g'|$

Suppose that m_l chooses e as a candidate against $g' \in [m, m_r)$. Given that e wins, then the payoff for m_l is:

$V^0_{m_l}\left(e, g' \in R_c, \sigma^{m*}_g(.), \pi^*_{g^t}\right) = -\frac{1}{1-\delta}\alpha^H |m_l - e|$

Therefore the candidate m_l is strictly dominated by the candidate e if and only if the following holds:

$\frac{1}{1-\delta}(|m_l - e| - \delta |m_l - g'|) > 0$ for every g'.

This is equivalent to $\delta < \frac{|m_l - e|}{|m_l - g'|}$ that from assumption 1 is satisfied. Hence by iterated deletion of dominated strategies m_l can be deleted. Consider now set of candidates that have survived iterated deletion of dominated strategies. i.e. $g \in [e, m_l)$, $g \in L_C$ and $g' \in R_C$. First note that the candidates $g \in (e, m_l)$ looses against any $g' \in R_C$, while the candidate e wins against any $g' \in R_C$. Hence, $g \in (e, m_l)$ are strictly dominated by e and can therefore be eliminated. Now, we can show that the most extreme candidate in R_C looses against any remaining potential incumbent candidate g. In fact we have established that e beats any $g' \in R_C$. Consider now $g \in L_c$. If g is the most extreme in L_C, by symmetry he wins; if g is any more centrist in L_C, by being closer to m again he wins. Hence, the most extreme candidate in R_C can be eliminated in the first round of iterated elimination. Consider now the most extreme candidate in L_C. This candidate loses against the most extreme in R_C (i.e. the most extreme in the set of candidates R_C after the first round of iterated elimination). On the other hand, e wins against any opponent and hence strictly dominates the most extreme candidate in the set L_C. Therefore, the most extreme candidate in L_C can be eliminated in the second round of iterated elimination. Applying the same logic in successive rounds, all the extreme candidates in the sets R_C and L_C can be eliminated. Hence $g' = m$ is the only candidate of the opponent party that survives iterated elimination. Given $g' = m$, from assumption 1, e is the only candidate of the incumbent party that survives iterated elimination.

Assumption 2: $|m - m_l| < A_{\min}$ with $A_{\min} = \frac{B+\delta C^H}{\alpha^H \delta}$, $|m_l - e| \geq |m - m_l|$ and $\delta > \frac{|m_l - e|}{|m_l - g'|}$)

Under assumption 2, from the previous argument it follows that e is strictly dominated by m_l. Therefore the candidates surviving iterated eliminations are $g \in [m_l,\ m]$ and $g' \in R_C$. When $\delta > \frac{|m_l - g|}{|m_l - g'|}$ $\forall g \in L_C$, then m_l strictly dominates every $g \in L_C$ because m_l prefers to have the candidate m_l for one period and the opponent $g' \in R_C$ for every future period rather than

have a candidate $g \in L_C$ in place for ever. Hence, party L runs m_l that chooses the high cost policy and is permanently replaced by the most extreme $g' \in R_C$. On the other hand, when $\frac{|m_l - g|}{|m_l - g'|} < \delta < \frac{|m_l - m|}{|m_l - g'|}$, m_l is strictly dominated by any $g \in L_C$. Once m_l is deleted, also the most extreme g' is strictly dominated by any other $g' \in R_C$. Hence, by elimination of strictly dominated strategies in successive rounds, $g = m$ and $g' = m$ are the only candidates surviving iterated elimination.

E Proof of Proposition 3

Given $c \in L_c$ assume that the following is satisfied:

Assumption 3: $\alpha |m - c| + C^L \leq C^H$, $|m - c| \geq A_{\min}$ with $A_{\min} = \frac{B + \delta C^H}{\alpha^H \delta}$ and $\delta < \frac{|m_l - c|}{|m_l - g'|}$

From proposition 2, candidates $g \in L_e$ and $g' \in R_e$ can be eliminated. Given assumption 3, the candidate m_l is strictly dominated by c and can therefore be eliminated. Also, c strictly dominates any other $g \in L_c$. Hence, c is the only candidate of party L surviving iterated elimination. Note that c beats any remaining possible opponent. Hence, the median party member m_r becomes indifferent amongst all candidates locations $g' = m_r$ and $g' \in R_C$.

On the other hand, using proposition 2 we obtain that when $\delta > \frac{|m_l - g|}{|m_l - g'|}$ $\forall g \in L_c$, then m_l strictly dominates every $g \in L_c$. Hence, party L runs m_l that chooses the high cost policy and is permanently replaced by the most extreme $g' \in R_c$. Finally, when $\frac{|m_l - g|}{|m_l - g'|} < \delta < \frac{|m_l - m|}{|m_l - g'|}$, m_l is strictly dominated by any $g \in L_c$ and also the most extreme g' is strictly dominated by any other $g' \in R_c$. Hence, by elimination of strictly dominated strategies in successive rounds, $g = m$ and $g' = m$ are the only candidates surviving iterated elimination.