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ESSAYS ON THE POLITICAL ECONOMY OF CLENTELISM AND GOVERNMENT PERFORMANCE

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ESSAYS ON THE POLITICAL ECONOMY OF CLENTELISM AND GOVERNMENT PERFORMANCE

by

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A Patricia;

A Santiago, Diego y Emilio;

A Lucha y Beto.

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ESSAYS ON THE POLITICAL ECONOMY OF CLENTELISM AND GOVERNMENT PERFORMANCE

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The purpose of my dissertation is to study the behavior of a government when it faces the competition of a political adversary and the consequences of its political strategy. The work is divided into two theoretical chapters.

The first paper explores how public resources are allocated either as patronage or public goods as a result of political competition. The question is motivated by: (1) The persistence of clientelism and patronage under democratic systems and following democratization; (2) The inconsistency of the theoretical argument stating that a positive relationship exists between patronage, on one hand, and poverty and inequality, on the other hand, with the fact that patronage is not necessarily reserved for poor groups or economies with high income inequality. I formalize a spatial model to examine the determinants and mechanisms of clientelism and these theoretical inconsistencies. The model challenges the idea of a unidirectional negative effect of wealth, government efficiency and political competitiveness over the use of patronage. I find that, given that

parties do not have complete information about citizens' preferences, when variables such as competitiveness, efficiency or wealth threaten the ability of leaders to control specific groups of citizens, leaders relocate resources and increase patronage investment to maintain the power over them. The analysis also argues that poverty is more important than wealth distribution as a determinant of patronage.

The second paper examines the effect that public trust in the political system has over government performance when the citizens decide to support one of two parties considering their past behavior as office holders. Two cases are compared: one in which information is perfect and the behavior in office can be directly observed by the citizens, and one where behavior is private information. I show that trust in the political system can encourage government performance when the difference of confidence between both parties is small. Otherwise parties behave opportunistically and government performance diminishes. Second, it is found that trust in the political system provide incentives for the parties to signal their ideological positions, reinforcing reputation and improving the evaluation of political campaigns. Lastly, I show that, low trust levels encourage political parties to maintain the private information structure; by contrast, when trust levels are high, political parties have an incentive to promote transparency of public officers' behavior.

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Chapter 1

An Economic Theory of Clientelism, Patronage and Political Competition

1 Introduction

The last democratization wave brought high expectations for the new democracies. Economic development, efficient governments and the decline of corrupt political behavior were some of the expected results in the new democratic regimes. Unfortunately, in many cases these promises have panned out. What we have learned from these experiences is that these outcomes are not necessarily inherent of political systems where individual rights of free speech and association are constitutionally enshrined and open and free competitions for elected offices takes place regularly. One characteristic that has prevailed in the new democracies is political competition based on patron-client relations.

In this paper I look into the determinants of the construction and maintenance of this political strategy. I ask how available public resources are allocated in the supply of public goods and in patronage when two parties compete for the support of citizens, given the political preferences of the agents, a set of individual characteristics assumed to be correlated with the citizens' political preferences, the distribution of wealth, and a set of institutional characteristics.

The question is motivated by the presence of patron-client relations in the political arena despite variation in the type of political regime, the survival of patron-client relations under democratic systems, and weak existing explanations of the general

dynamics of patron-client relations that imply the following theoretical and empirical contradictions.

i) The classical literature on clientelism characterizes the patron-client relation in a way that is usually attached to *traditional* groups and societies.[1] There is no doubt that such *traditional* societies, and also authoritarian regimes and dictatorships, have used patronage and clientelism to gain support within the citizenry. But this practice has also survived in some developed democracies (see Blakeley 2001, Krisinsson 1996 and 2001, and Warner 1996 and 1997 for an analysis of some European countries; for the United States and Canada, see Clark 1994, Alesina, Baquir and Easterly 1998, and Fletcher 1994).

ii) The idea of *traditional* societies is always linked with developing economies, which tend to have unequal wealth distributions and significant poverty problems. Thus, clientelism has been positively related with inequality and poverty and has been considered endemic to developing countries (Robinson and Verdier 2002). There are, however, egalitarian societies where clientelism has been a common political strategy, including Iceland (Kristinsson 2001) and Canada (Fletcher 1994); and it is not difficult to find economically powerful clients and brokers such as entrepreneurs and union leaders (Verdier 1995; Roniger 1990; Lowery and Brasher 2004).

iii) Clientelism is associated with corruption and, from the democratic ideal point of view, it is considered a typical problem of less developed democracies. It threatens the freedom of choice, including the free formation and expression of political preferences. Rational choice analyses of democracy and political competition argue that the rise of party competition will weaken this and other non optimal and inefficient political behaviors, even when the political market is not perfect (Becker 1983, 1985; Stigler 1971, 1972; Wittman 1989).[2] Some scholars argue that under a more competitive party system, the median voter acquires significant importance, and encourages the use of programmatic policies as a mean of gaining political support (Verdier 1995).

[1] For a critical overview of the classical literature on clientelism see Piattoni (2001).

[2] Stigler argues that political and economic competition have the same characteristics, therefore a competitive political arena would lead to efficient results. Becker also suggests that competition among pressure groups produced efficient outcomes. However, both authors recognize that the political market is imperfect and therefore they produce suboptimal results. Wittman's argument is similar to Beker's, but he sustains that in general, democracy leads to optimal and efficient outcomes.

Nonetheless, clientelism has survived the development of competitive party systems, and is used as a political strategy in some developed democracies. Furthermore, in some cases the use of patronage has *increased* after the party system has become more competitive (Villarreal 2002; Moreno 2005).

iv) Finally, the classical approaches to clientelism, argue that dyadicity, personalism and inequality of power and resources, are important characteristics and determinants (Silverman 1977; Einsestand and Lemarchand 1981; Einsestand and Roniger 1984; Graziano 1976; Schmidt et al. ed. 1977; Brusco, Nazareno and Stokes 2002; Medina and Stokes 2002; Robinson and Verdier 2000). This perspective underlies analyses that consider clientelism coercive and exploitative practice (Graziano 1976; Mouzelis 1985; Li Causi 1981). Nonetheless, in contemporary clientelism, the monopolistic position of the patron over the means of livelihood of her clients is less common; therefore, clients can enter the relation voluntarily and in many cases they are able to abandon it without jeopardizing their survival. Moreover, although in many cases a personal relationship between the patron and the client does exist, clientelism has evolved into a massive and anonymous strategy, involving groups like unions or corporations (Silverman 1977; Mavrogordatos 1997; Collier and Collier 1991; Heredia 1994), where personalism and, to some degree, the coercive power are diluted.

Hence, the corollary questions concern: (1) The conditions for the existence of patron-client relations; (2) The effects of structural issues such as income distribution, poverty, social cleavages and ideological preferences of the citizens on patronage; and, (3) How patronage and clientelism are affected by institutional variables like the internal organization and composition of parties and the level of freedom and fairness to compete within the political arena, that determine the programmatic preferences of the parties and their competitive power.

There is no consensus about a single definition of clientelism and patronage, and the two concepts are sometimes considered different phenomena (see Medina and Stokes 2002 and Piattoni 2001). In this paper I share Piattoni's argument, and consider both concepts the same type of political strategy based on their general features (Piattoni, 2001). An increasing number of scholars acknowledge that a general feature of the patron-client relationship is the logic of exchange (Schmuel and Roniger 1980; Roniger

1994; Piattoni 2001). I analyze this phenomenon as an exchange relation "ruled by the pure economic goal of benefit-maximization" (Piattoni 2001: 11), where politicians seek to increase and maintain their political power, trading support within the citizenry for public decisions that produce private benefits.[3]

In a simple probabilistic spatial model where an incumbent party and an opposition party compete for political support, and where the ideological and programmatic policy preferences of the citizens are private information, I analyze to how the party in office allocates a given amount of public resources through the provision of patronage and public goods within its constituents. Parties compete programmatically by assuming a political platform observed by the citizens and, in the case of the incumbent, by making public decisions about the allocation of the public expenditure. Patronage would only be used to co-opt citizens who oppose the incumbent, but since the ideological and programmatic policy preferences of the citizens are not observed by the parties, the party in office faces an agency problem. Citizens however, have other observable characteristics that can signal their preferences. Thus, the incumbent can separate the population into different clusters according to these characteristics and link them with their possible ideological positions by a set of subjective probability functions. Both parties then choose their political platforms according to their competitive strengths, and the party in office decides how to allocate the public resources. The different political-economic equilibria are characterized by a set of party decisions, containing the programmatic positions of the parties, the amount of public resources used to provide public goods and the level of patronage invested in each group within the economy.

I show that it is not just the cost of co-optation, which is driven by the political preferences of the citizens, their private consumption utility function, and their capacity to generate wealth, that determines patronage and the way it is allocated within the citizenry. This is determined, instead, by the relative political relevance that each group of citizens has as a support provider in the political competition process, the competitive power of the parties, and their ideological characteristics.

The rest of the paper proceeds as follows. First, I set-up the model. I then explain the different type of equilibria and the impact of structural and institutional

[3] The definition is basically the one given by Piattoni (2002: 4).

characteristics, like individual income, ideological preferences distribution, effectiveness to provide public goods and parties' ideologies, on patronage (section 3) Subsequently, I analyze the relation between clientelism and poverty and income distribution (section 4) in a partial equilibrium environment. I then examine how political competition impacts the use of patron-client relations in a general equilibrium environment; and finally section 5 closed the paper with a summary and final discussion of the results.

2 An Economy with Political Competition and Clientelism

2.1 The Agents

There are two types of agents, political competitors and citizens. The political competitors are one incumbent party, indexed by *A*, and an opposition party, indexed by *B*. These two parties compete for the support of the citizens by assuming some political platform which is publicly observed. The incumbent has public resources that can be used to provide public goods and to create clientelistic relations by patronage. Thus the incumbent does not just compete by presenting a political platform but also by distributing the available public resources as public goods and patronage.

The Citizens

Citizens are represented by a large population of *I* heterogeneous agents who differ in a number of characteristics including income and ideology.

Ideology is used as a reference or mechanism by citizens to link the perception they have of political competitors and the way their rule may affect them or the policy space (Hinich and Munger 1994; Enelow and Hinich 1990). Thus each citizen from a population of size *T*, has a perception about each political competitor's ideology given by the platform they present. These perceptions are private information and can be situated over an ideological line where the citizen also locates her own ideological most preferred position. The citizen's ideological position reflects other individual characteristics and it is assumed that political platforms cannot credibly modify these; therefore they are fixed parameters in the model. Each citizen is indexed by its ideological position over the real line, *i*. Citizens select the party which they support in view of the parties' political

platforms, their provision of public goods and the clientelistic relations established by the incumbent. The preferences of citizen *i* over the two parties are represented by the comparison of the following utility functions:

$$V\left(A|i\right) = -\left(a-i\right)^2 + \hat{g} + u\left(c^i\right) \tag{0.1}$$

$$V\left(B|i\right) = -\left(b-i\right)^2 + u\left(c^i\right) \tag{0.2}$$

Functions $V\left(A|i\right)$ and $V\left(B|i\right)$ represent the level of citizen *i*'s empathy for the government party and the opposition respectively. These levels depend on their private consumption, c^i, and the ideological difference between the citizen and the parties' platform. Private consumption of citizen *i* is given by her income and an individual transfer if she becomes a client of the party. Thus:

$$c^i = \begin{cases} y^i + t^i & \text{if } i \text{ is a client,} \\ y^i & \text{if } i \text{ is not a client.} \end{cases} \tag{0.3}$$

Where y^i is agent *i*'s income and t^i is the transfer that this agent receives when she becomes a client. There is also a finite set of possible income levels $\{y_1, y_2, ..., y_M\}$ and then $y^i \in \{y_1, y_2, ..., y_M\}$ for every *i*.

With out loss of generalization, function $u(\cdot)$ is assumed to be the same for every citizen, and it is also assumed to be continuous, differentiable and strictly concave:

$$u(0) = 0,\ u'(\cdot) > 0,\ u''(\cdot) < 0,\ u'(0) \to \infty. \tag{0.4}$$

The provision of public goods favors the position of the incumbent relative to the opposition and therefore it is also considered in the function $V\left(A|i\right)$ where it is represented by $\hat{g}$. Each citizen gives her support to just one of the parties. Thus, citizen *i* supports the incumbent party if $V\left(A|i\right) > V\left(B|i\right)$; if $V\left(A|i\right) < V\left(B|i\right)$, she gives her support to the opposition and if she is indifferent between both parties, she supports each of them with a probability of 0.5.

The Political Parties

The political parties are assumed to be predator agents; following Levi's argument (Levi, 1988), their main objective is to maximize the political revenue given their resources and institutional constraints. The support that different agents within the citizenry provide to each party is their source of political revenue.

Parties, like citizens, have different ideological positions upon by their members agree. These positions are common knowledge for the two parties and any deviation of their platforms from these points implies a cost for them. These costs are different for each party and respond both to the characteristics of the party itself and to the structure of the political system.

Parties are comprised of different kinds of agents, *office seekers*, just care about being in office, while *ideologues* and *activists* care more about the ideological position of the party. The costs faced by the parties which deviate their platform from their agreed ideological position responds to the internal composition of the party. The more radical the members of the party are, higher is the cost of deviating. It also has been argued that differences on resources between parties affect their composition and therefore their costs of competing. For example, in many cases opposition parties are labor intensive. The resources to present their political platforms differ from those of party with greater material resources; when a party faces material constraints, its competitive capacity is based on activism and then it tends to be more radical. Opposition parties may also face other kind of external barriers, such as government control of the media or the threat of repression, that increase their relative competitive costs.

The model assumes that the parties have different costs of assuming a political platform that differs from their ideological positions. These costs rise as the distance between the platform and the party ideology increases. Let *a* be the position over the ideological space of the platform assumed by the incumbent, and *b* the one assumed by the opposition. Then the costs for the two parties are represented by functions $C_A(\cdot)$ and $C_B(\cdot)$ with the following characteristics:

$$C_A'(\cdot) > 0,\ C_A''(\cdot) \geq 0,\ C_A'(0) \geq 0, \tag{0.5}$$

$$C_B'(\cdot) > 0,\ C_B''(\cdot) \geq 0 \text{ and } C_B'(0) > 0. \tag{0.6}$$

The existence of an opposition implies that at a minimum its members are better off by sustaining their organization. This implies that the cost for the incumbent of absorbing the opposition into its organization by adapting its political platform and providing public goods too high. As a result, it is also assumed that the cost to the incumbent grows too fast when its platform becomes too close to that of its rival, so there exists an opposition that competes against the incumbent. Formally that implies $\pi T < C_A(x)$ for any $x \geq L$, where L is the ideological position of the rival.

Incumbent parties have the advantage of using policy as a means to compete in the political arena, but they can also use public resources to favor individuals and buy their political support with a threat of withdrawing the favor if the support is not given to them. Thus, the model assumes that the incumbent has a fixed amount of public resources G that can be invested to produce and provide a public good or to establish a clientele-patron relationship. The budget constraint for the incumbent is:

$$g + p \leq G, \tag{0.7}$$

where g is the amount of public resources invested in public goods and p are those resources utilized for patronage.

The incumbent also has a technology to produce public goods which is assumed to have constant marginal productivity. Then the amount of provided public goods is given by $\hat{g} = Kg$, where parameter $k > 0$ is the marginal productivity of the incumbent and represents its efficiency to provide public goods.

The model assumes anonymity: in other words, the political revenue that a party obtains from the support of each citizen is exactly the same. Moreover, the political value that the parties attach to the support of a citizen or their efficiency in obtaining revenue from her, is assumed to be a fixed value, equal for both parties and it is represented by parameter π. Thus, the parties compete by assuming a specific political platform but the incumbent party also distributes public resources as of public goods and patronage to obtain as much support as possible within the citizenry.

It is true that these are strong assumptions. The valuation of political support and the capacity to extract revenue from a group usually differs among the different competitors and they also depend on particular characteristics of the different citizens that

comprise the group. However, this model does not intend to explain the mechanisms of extracting revenue, but rather how competition affects the allocation of resources into clientelistic relations. Therefore, these assumption not only simplify the notation without modifying the general results, they also help to clarify the allocation mechanism and the competition effects.

As a result, even though only the incumbent party governs, both competitors seek to maximize the political revenue they can obtain from the citizenry given their cost structures and resources.

2.2 Informational Structure and the Ideological Space

When political parties compete for the support of the citizens, they present or signal platforms that are agreed within their members and which not necessarily coincide with their ideal positions. Citizens observe this signals and they interpret them according with their individual information and characteristics. This allows each citizen to create a space where she locates the positions of the parties in relation to her own according with her perception. These individual ideological spaces are normalized to construct a single ideological space where all the ideological positions are located, including the parties' ideal points, relative to the signaled platforms. This would be the ideological space over which the parties would define their platforms in the competition, but since individual ideological interpretations and locations are private information they are not directly observable and parties should base their strategies over a different space.

This implies an agency problem for the incumbent. An efficient allocation of resources consists in the establishment of client-patron relations with individuals that, given the platforms and the level of expenditure in public goods, support the rival. Then the incumbent targets rival supporters to modify the direction of their preferences, otherwise resources would be wasted. But there is no incentive for the citizens to reveal their true position since they are always better-off if they become clients; their best strategy would be announcing a radical position against the incumbent to obtain the maximum amount of clientelistic resources. Even in the presence of brokers who can observe individual positions within a set of citizens, the incentive is the same since

arbitrage is possible. Patrons, therefore, try to avoid these pooling equilibrium situations to maximize their revenues.

Although individual ideological positions are not observable, there are other visible characteristics that can signal these positions and then, citizens can be separated into different groups according with these characteristics. Since some of these characteristics are ideological determinants, membership bounds the possible ideological positions that each citizen may assume. Then, membership signals a probability distribution over the ideological space that allows the incumbent to allocate its resources in a more efficient separable equilibrium. Members of a particular group can be targeted as possible clients and the incumbent offer each of them the same quality of patronage according with their group characteristics which includes their income level.

The model assumes a finite set of vectors, $\left\{q^1, q^2, \ldots, q^J\right\}$, with $q^j \in \mathbb{R}^n$ for $j = 1, ..., J$, which elements represent the observable characteristics, income included, that define the social group j and link it with some probability distribution about the ideological position of its members. Since income is an element of the vector of characteristics then $J \geq M$. To simplify notation, let $y_m \equiv y^j$ if y_m is an element of vector q^j. Thus, there exist a set of group-specific probability functions $\left\{F^j(x)\right\}_{j=1}^{J}$, which are assumed to be continuous, with probability density function $f^j(x)$ over $\left[\psi^j - \frac{1}{2\phi^j}, \psi^j + \frac{1}{2\phi^j}\right]$, where $\phi^j \in (0, \infty)$, and which are common knowledge for the political parties. To simplify, every $f^j(x)$ is assumed to be single picked with a unique maximum at $m^j \in \left[\psi^j - \frac{1}{2\phi^j}, \psi^j + \frac{1}{2\phi^j}\right]$, then $f^{j\prime}(x) \geq 0$ for any $x < m^j$ and $f^{j\prime}(x) \leq 0$ for any $x > m^j$. The members of each group have some inherently ideological bias given by ψ^j and the ideological volatility of the group is represented by the parameter ϕ^j. The single picked assumption can be interpreted as if there exists some predominant ideological position in any group and that predominance is unique.

Every citizen is attached to some social group according with her individual characteristics. This means that each citizen also has a vector of observable characteristics, q^i, that is equal to some $q \in \left\{q^1, q^2, ..., q^J\right\}$, and then citizen *i* is a member of group *j* if $q^i = q^j$. The population share of group *j* is α^j with $\sum_{j=1}^{J} \alpha^j = 1$.

Thus, $F^j(x) = \text{prob}\left\{i \le x \middle| q^i = q^j\right\}$ and it is a mapping function that goes from the space of observable characteristics to a segment of the ideological line. Since individual ideological positions are not observable, political parties decide their strategies considering an ideological space given by the union of the supports of the group-specific density functions. Then the ideological space is given by $\bigcup_{j=1}^{J}\left[\psi^j - \frac{1}{2\phi^j}, \psi^j + \frac{1}{2\phi^j}\right]$ which is assumed to be continuous. The positions that parties can locate with certainty over this ideological line, are just their own and those of their respective rival. The space is normalized around the incumbent position located on 0 and the rival is situated on point *L*.

2.3 Competition

Each party tries to obtain as much revenue as possible by maximizing the expected number of supporters considering the cost of signal a particular platform and the political value they attach to each supporter. The incumbent also allocates the public resources to maximize her revenue by investing in public goods and in patronage. There is an ideological position over the space where, given the platforms and the supply of public goods, specifies the location of those agents that are indifferent between the two parties. For the rest of the paper I will call this position the ***pivotal point***, θ, and it is defined from (0.1) and (0.2) as $\theta = \frac{Kg + b^2 - a^2}{2(b-a)}$. Those citizens located to the left of this point, support the incumbent and those on the right support the opposition. Is within this last group where the incumbent would invest in patronage if citizen's ideological positions could be observed.

The total amount of patronage is distributed in individual transfers. Each member of group *j* receives a transfer t^j, then $\sum_{j=1}^{J} t^j \alpha^j T = P$ with $0 \le t^j \le P$ for every *j*.

Then, the expected share of the population that supports the incumbent, *S*, given platforms *a* and *b*, the investment in public goods *g* and the patronage set of transfers $\left\{t^j\right\}_{j=1}^{J}$, is $S = \sum_{j=1}^{J} \alpha^j F^j \left(\frac{u\left(y^j + t^j\right) - u\left(y^j\right)}{2\left(b-a\right)} + \theta \right)$. Notice that if the probability of support the incumbent for any member of group j' is one, then there is no patron-client relation between this group and the incumbent. That is, if $\theta > \psi^{j'} + \frac{1}{2\phi^{j'}}$, then $F^{j'}\left(\theta\right) = 1$ and $t^{j'} = 0$.

Thus the goal for the parties is to maximize their expected revenue in a one shot game by setting their platforms, the investment in public goods and the allocation of patronage, which is define by the following two problems:

$$\max_{a,g,\left\{t^j\right\}_{j=1}^{J}} \pi T S - C_A\left(a\right) \tag{0.8}$$

$$\text{s.t.} \quad \pi T S - C_A\left(a\right) \ge 0$$

$$T \sum_{j=1}^{J} \alpha^j t^j + g \le G$$

$$g \ge 0$$

$$t^j \ge 0$$

$$L \ge a \ge 0$$

and

$$\max_{b} \pi T\left(1 - S\right) - C_B\left(L - b\right) \tag{0.9}$$

$$\text{s.t.} \quad \pi T\left(1 - S\right) - C_B\left(L - b\right) \ge 0$$

$$L \ge b \ge 0 .$$

Notice that in any equilibrium with positive patronage, some groups receive resources from the incumbent but even though every member of these ***clientelistic groups*** collects a transfer, not all of them necessarily support the incumbent. This implies that within each clientelistic group there exist a point over the ideological line that determines the expected share of each clientelistic group that support the incumbent; to differentiate this from the pivotal location, I will call it the ***swinger member*** point.

The possible equilibria are characterized by the Kuhn Tucker conditions (see Appendix A1) for the previous maximization problems. The purpose of the next two sections is the analysis of these possible equilibria.

3 PATRONAGE AND PUBLIC GOODS; A PARTIAL EQUILIBRIUM ANALYSIS

The allocation of public resources when parties are competing in the political arena may imply the creation of patron-clientele relations; nevertheless this is not a necessary result of political competition. In this section the different cases that can arise: when there is no patronage, when there are both patronage and investment in public goods and when no public goods are provided and all the resources are invested in patronage. The last case can be considered an extreme one but it gives some important insights. In this section, in the spirit of simplifying the exposition, I analyze these cases in a partial equilibrium context to clarify the way resources are allocated into patronage. Thus, during the analysis I consider the ideological positions of the parties' platforms as constants. This can be interpreted as if the cost of assume a different platform would be extremely high, then, any change on the other variables doesn't affect the political competition over the ideological space.

3.1 THREE TYPES OF EQUILIBRIA

The Case without Patronage

In some cases patronage is not the best strategy to maximize the incumbent's revenue and she finds the investment in public goods a better way to attract the support

within the citizenry. This type of equilibrium implies that, for any combination of ideological platforms, it is not possible to find a clientelistic structure where the use of patronage would have a greater marginal effect on the expected share than the marginal consequence of providing public goods on the political support (see Appendix A2).

This type of political-economic equilibrium is a set $\left\{a^*, b^*, g^*, \left\{t^{j*}\right\}_1^J\right\}$, such that

$$t^{j*} = 0\,, \quad g^* = G \quad \text{and} \quad f^j\left(\frac{KG + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right)u'\left(y^j\right) \leq TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{KG + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) \quad (0.10)$$

for every j.

It is also the case that not every group is prone to become a client for the incumbent. To be considered susceptible of becoming a clientelistic group, the marginal net revenue of that group must be positive. This is that the gain of investing in patronage in that specific group must be greater than the marginal gain obtained from the same group by investing the same amount of resources in public goods. Since patronage must be supplied as an individual unique transfer to each member of the targeted group, if the group is greater then the total investment in patronage must be higher. Then, given the individual income within a particular group, there is a threshold for the marginal revenue obtained from supplying public goods that depends on the group size and its relative ideological identification or density. At this point obtaining support using patronage is too expensive and therefore cooptation is more efficient investing in the provision of public goods. Obviously, groups with greater individual income are less sensitive to changes on their consumption levels, and then it is more expensive to obtain their support. If the income level of its members is high enough, then the marginal cost of support obtained with patronage is always greater than the cost with public goods to obtain the same political support, even if the group is small. This idea is summarized in the following result.

Result 1 Given the incumbent's efficiency to provide public goods, the size of each group and its relative ideological density there is a maximum individual income level for each group, to be considered as a possible client. Thus, if

$y^j \geq u'^{-1}\left(\frac{TK\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)}\right)$ (0.11), where $x_m = \arg\min_x \sum_{h=1}^{J}\alpha^h f^h\left(x\right)$, then group *j* is never targeted as a possible client.

Proof. See appendix A3.

From Result 1, it follows the next corollary.

Corollary 1

i) If the individual income level for group *j* given the size of the group and the incumbent's efficiency, is such that $u'\left(y^j\right) \leq KT\alpha^j$, then the members of this group are never targeted as clients.

ii) Given the individual income level of group *j*, its relative density, the population size and the incumbent efficiency, if the population share is such that $\alpha^j \geq \frac{u'\left(y^j\right)}{TK} - \frac{\sum_{-j} f^h\left(\hat{x}_m\right)}{f^j\left(m^j\right)}$, where $\hat{x}_m = \arg\min_x \sum_{-j}\alpha^h f^h\left(x\right)$, then group *j* is never targeted as a client.

iii) Given the individual income level of group *j*, its relative density and its population share, if the population size and the incumbent efficiency are such that $TK \geq \frac{u'\left(y^j\right) f^j\left(m^j\right)}{\sum_{h=1}^{J} f^h\left(x_m\right)}$ then group *j* is never targeted as a client.

iv) Given the individual income level of group *j*, its population share, the population size and the incumbent efficiency, if the relative density is such that $\frac{\sum_{h=1}^{J} f^h\left(x_m\right)}{f^j\left(m^j\right)} \geq \frac{u'\left(y^j\right)}{TK}$ then group *j* is never targeted as a client.

Proof. See Appendix A4.

According with Corollary 1, the previous result does not rule out the possibility of high income clients. If the members of some group have high income, but the number of members is small, it may be considered a possible client since the total amount of patronage would be not so high even though it is more costly to obtain the support of these citizens. More over, the model assumes that the support of each citizen has the same political value, but this is not necessarily the case, high income citizens for example can contribute to political campaigns and therefore can be more attractive to the parties. It is also the case that if the incumbent is inefficient to supply of public goods, she would choose a patronage strategy even in the case of high income groups.

The corollary also identifies the ideological volatility as an important issue. When a group is less identified with an ideological or programmatic position, its variance will be high and therefore the density in every point would be low. Then, the expected support given some level of patronage will be low compared to what would be expected from other group with less ideological volatility. Patronage is therefore allocated within the groups with greater ideological identification.

Given the parties' platforms an the amount of public resources, according with condition (0.10), any group is less prone to become a client:

i) the greater is the individual income within the group,

ii) the less is the ideological identification of the group, this is that ϕ^j is smaller, the variance is greater and the density is smaller in each point, and

iii) if the incumbent is more efficient in the provision of public goods.

Note that, given the programmatic position of the parties, the social optimal allocation is such that for every citizen i, $u'\left(y^i+\tau^i\right)=KT\alpha^i$, where τ^i is any real number greater that $-y^i$. When income is high enough so $u'\left(y^i\right)<KT\alpha^i$, given the budget constraint of the government, citizen i would prefer to have less private consumption and more public goods, thus the optimal allocation would be a greater tax rate in order to increase the level of public goods. Therefore, if every citizen has a sufficient high income, patronage will be null and income tax will be high. Note that the social optimal allocation will also maximize the incumbent's political support given the ideological platforms since the investment in public goods is politically more profitable

than patronage. This is consistent with cases of countries with high income and high taxation, where the generalized use of patronage is practically inexistent.

The Case with Patronage and no Public Goods

The opposite case can also occur. It is possible that the incumbent finds more profitable to invest all the resources in patronage. An equilibrium in this case is a set $\left\{a^*, b^*, g^*, \left\{t^{j*}\right\}_1^J\right\}$ such that $g^* = 0$, $T\sum_{j=1}^{J} \alpha^j t^{j*} = G$,

$$f^j\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) u'\left(y^j + t^{j*}\right) > TK\sum_{h=1}^{J} \alpha^h f^h\left(\frac{u\left(y^h + t^{h*}\right) - u\left(y^j\right) + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right),$$

$$f^j\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) u'\left(y^j + t^{j*}\right) \geq f^{j'}\left(\frac{u\left(y^{j'} + t^{j'*}\right) - u\left(y^{j'}\right) + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) u'\left(y^{j'} + t^{j'*}\right), \quad (0.12)$$

$$f^j\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) u'\left(y^j + t^{j*}\right) \geq f^k\left(\frac{b^* + a^*}{2}\right) u'\left(y^k\right),$$

for any $j \neq j'$ such that j and j' are any two clientelistic groups and k it is not, that is t^j, $t^h > 0$ and $t^k = 0$. Condition (0.12) holds with inequality just in the case group j would be totally co-opted, this is that patronage is such that the whole group j supports the incumbent with certainty. In this case $t^{*j} = u^{-1}\left(u\left(y^j\right) + a^{*2} + b^{*2} + \left(\psi^j + \frac{1}{2\phi^j}\right)\left(b^* - a^*\right)\right)$, which is the minimum transfer to gain the support of the most radical opposition member within group j.

When condition (0.12) holds with equality, it implies that the expected marginal revenue per member of each group obtained from patronage must be the same for all the

clientelistic groups. Then, groups with greater expected marginal revenue per member are targeted as possible clients in the first place.

Given the assumption that every citizen's support has the same individual political relevance, and when conditions are such that patronage exist, the incumbent considers as probable clientelistic groups in first place:

i) those with the lowest individual income, and

ii) those with a greater ideological identification, which implies a higher density.

Notice that group size is not an issue to take into account since the incumbent is just interested on the expected revenue per group member.

In this case there may be some groups with greater marginal patronage revenue than marginal public goods revenue, but even though these groups are susceptible to become clients, resources are not enough to provide them with patronage. This is:

$$f^j\left(\frac{b^*+a^*}{2}\right)u'\left(y^j\right) > Tk\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right) \text{ for some } j.$$

The Interior Case with Investment in Patronage and Public Goods

Probably the most common case is when rulers obtain revenue of both the provision of public goods and the patron-client relations. In this case an equilibrium must imply that available resources are allocated in such a way that the marginal revenues of patronage and public goods are equal unless in the equilibrium some group would be co-opted completely providing a grater marginal revenue than the one obtained from the supply of public goods. Then according with the Kuhn Tucker conditions (see Appendix A1), an equilibrium of this type is a set $\left\{a^*, b^*, g^*, \left\{t^{j*}\right\}_1^J\right\}$ such that $g^* > 0$, $T\sum_{j=1}^{J}\alpha^j t^{j*} + g^* = G$, where for every clientelistic group *j*,

$$f^j\left(\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)u'\left(y^j+t^{j*}\right) \geq$$

$$TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right), \qquad (0.13)$$

and for every non clientelistic group k it is the case that,

$$f^k\left(\frac{Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)u'\left(y^k\right)\leq TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right),$$

where $t^j>0$ and $t^k=0$.

Patron-client relations can be settled with groups around the pivotal point. In that case since some of the members of these groups support the incumbent without patronage, the minimum amount for the patronage transfers to arrange a clientelistic relation is practically zero. Thus, clients can be located around the swinger position and in that case the individual transfer is such that $t^{j*}\in\left(0,u^{-1}\left(u\left(y^j\right)+a^{*2}-b^{*2}+\left(\psi^j+\frac{1}{2\phi^j}\right)\left(b^*-a^*\right)-Kg^*\right)\right]$.

There can also be clientelistic groups beyond the pivotal point. Neither member of these groups supports the incumbent without some patronage transfer. These certain opponents for the incumbent can be an important revenue source and then patronage will be used to attract them. In that case the minimum amount of individual transfer must be higher than the minimum for clients around the pivotal position and

$$t^{j*}\in\left[u^{-1}\left(u\left(y^j\right)+a^{*2}-b^{*2}+\left(\psi^j-\frac{1}{2\phi^j}\right)\left(b^*-a^*\right)-Kg^*\right),\right.$$
$$\left.u^{-1}\left(u\left(y^j\right)+a^{*2}-b^{*2}+\left(\psi^j+\frac{1}{2\phi^j}\right)\left(b^*-a^*\right)-Kg^*\right)\right]$$

which implies that these type of clients must be consider a better source of revenue by the incumbent than those around the pivotal point.

In the case that the individual transfer for a group reaches its upper bound, then the group is completely co-opted and then condition (0.13) becomes:

$$f^j\left(\psi^j+\frac{1}{2\phi^j}\right)u'\left(y^j+t^{j*}\right)\geq TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)\quad(0.14)$$

with $t^{*j}=u^{-1}\left(u\left(y^j\right)+a^{*2}-b^{*2}+\left(\psi^j+\frac{1}{2\phi^j}\right)\left(b^*-a^*\right)-Kg^*\right)$, and condition (0.14) holds with strictly inequality just for groups that are totally co-opted.

Notice that the left side of condition (0.13) is not monotone on t^* and there can be multiple solutions if this condition holds with equality. Nevertheless not all of them are possible equilibria. The next lemma shows this.

Lemma 1 If in an equilibrium $\left\{a^*, b^*, g^*, \left\{t^{j*}\right\}_1^J\right\}$ condition (0.13) holds with equality for any group *j*, then the following must hold:

$$\left(\frac{u'\left(y^j + t^{j*}\right) - KT\alpha^j}{2\left(b^* - a^*\right)}\right)\left(u'\left(y^j + t^{j*}\right) - TK\alpha^j\right) f^{j\prime}\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) +$$

$$u''\left(y^j + t^{j*}\right) f^j\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right) < 0,$$

otherwise group *j* is totally co-opted and condition (0.13) hold with inequality.

Proof. See Appendix A5.

This lemma implies that the transfer in every not totally co-opted group is such that the expected marginal net revenue of each of these groups is decreasing on patronage transfers, otherwise, since there are available resources, it would be possible either to invest more in patronage or reduce patronage within that group and increase the total political revenue.

Assuming condition (0.13) holds with equality for some group *j* the patronage transfer per member of the group is given by

$$t^{j*} = u'^{-1}\left(KT\alpha^j + \frac{K\sum^{-j} T\alpha^h f^h\left(\frac{u\left(y^h + t^{h*}\right) - u\left(y^j\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right)}{f^j\left(\frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)}\right)}\right) - y^j. \quad (0.15)$$

Let $\Phi^j = \dfrac{f^j\left(\dfrac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)}{\sum_{h=1}^{J}\alpha^h f^h\left(\dfrac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)}$, which is the relative density of group *j* with respect to the weighted average density within those groups containing the pivotal point and other clientelistic groups.

3.2 DETERMINANTS OF PATRONAGE TRANSFERS IN THE INTERIOR CASE

According to equation (0.15), patronage transfers for any clientelistic group depends on the relative average density for the clientelistic group. If the relative density increases then group *j* is a better client and therefore patronage within this group increases. The final effect of the different variables and parameters over patronage depends on how the relative average density is affected. The clearest effect is that from the relative density it self which is related with the ideological dispersion of the clientelistic groups. The effects of other important variables and parameters are less explicit and can be ambiguous since they depend on the characteristics of the density functions. Here this effects are analyzed considering some assumptions over the density functions to clarify the insights of the model.

Ideological Dispersion

Note that when the swinger member density is greater for a clientelistic group, it is always the case that patronage transfers increases for that group. Intuitively this means that when a group has less ideological dispersion it's easier to co-opt, then the political return of patronage and the expected political revenue are greater.

Result 2 In an equilibrium the density of the swinger member of any clientelistic group has a positive effect on the patronage transfer for that group.

Proof. See Appendix A6.

The effect of other variables like the income level, the incumbent effectiveness to provide public goods and the political competitiveness of the parties is less clear since they affect the relative average density and therefore their net effect over patronage depends on the characteristics of the density functions. Then to analyze how these variables affect patronage it would be useful to make some assumptions about the probability density functions or about the relative average density.

Income Effect

As in the case where all the public resources are used in patronage, it is expected that richer groups would be much more expensive to co-opt than the poor. That implies that the marginal revenue of patronage is greater within poor groups and then the incumbent would target first these groups as clients. But the negative relationship between income and patronage is less clear when there is private information and members are not distributed uniformly within some group. This is due to the effects on the expected support within each group which depends on the change of the swinger members' densities. If income grows for the members of some clientelistic group, given the amount of the patronage transfers, less members can be co-opted. This implies that the swinger member shifts towards the incumbent location. When this shift affects the density of the swinger member, the relative marginal revenue of patronage changes but not necessarily decreases and then it is possible a relocation of resources with grater patronage transfers. Obviously if the relative density is constant, then the transfers are always decreasing on income level and therefore patronage and clientelism within a group always decline when its members' income level grows. That is for example the case in which every group has a uniform distribution. Then equation (0.15) becomes

$$t^{j*} = u'^{-1}\left(\frac{K\sum_{h=1}^{J} T\alpha^h\phi^h}{\phi^J}\right) - y^j, \qquad (0.16)$$

where the relative density just depends on constant parameters and then the transfer decreases if income grows. But if the relative density is affected by changes in income level, the story can be different.

If an increase on income of a particular group has a negative effect on its relative density, that implies a reduction of the marginal revenue of patronage, the individual transfer for that group decreases just as in the uniform distribution case. Nevertheless, if in equilibrium an increase on income will shift the swinger member causing a reduction of the expected support within the group but the marginal change of the swinger member's density can be high. It can be high enough to more than compensate the loss of individual marginal utility of the transfer caused by the rise of income. If when public resources are reallocated, the effect on the average density is such that the final relative density is greater than the initial one, then although the higher income makes the members more expensive to co-opt, the group is relatively more profitable than the others so the incumbent decides to invest more in that group. (See Appendix A6 for the general formal statement)

To clarify this mechanism it is useful the following assumption.

Assumption 1 Every group has a uniform distribution except group *j* which is a clientelistic group with a continuously differentiable p.d.f., $f^j(\cdot)$, over $\left[a^*, b^*\right]$.

This assumption implies that any change on the relative density of any group is due to movements of group *j*'s density. Thus, when the swinger member density within group *j* is steep enough, if income for group *j* increases, there would be a big jump of the swinger member's density. If this change is too high, it would imply a grate loss of support within the group increasing the marginal revenue of the investment in patronage and therefore more resources would be allocated in clientelism. The next result shows this.

Result 3. Under Assumption 1,

i) If $f'^j(\chi) = 0$, then $\frac{\partial t^{j*}}{\partial y^j} < 0$,

ii) If $y^j \to u'^{-1}\left(KT\alpha^j\right) - t^{j*}$, then $\frac{\partial t^{j*}}{\partial y^j} < 0$,

iii) When $f'^{j}(\chi)<0$, then $\frac{\partial t^{j*}}{\partial y^{j}}<(>)0$ if

$$-\frac{f'^{j}(\chi)}{f^{j}(\chi)}<(>)\frac{2\left(b^{*}-a^{*}\right)u''\left(y^{j}+t^{j*}\right)}{\left(u'\left(y^{j}+t^{j*}\right)-u'\left(y^{j}\right)\right)\left(u'\left(y^{j}+t^{j*}\right)-KT\alpha^{j}\right)},$$

iv) When $f'^{j}(\chi)\geq 0$, then $\frac{\partial t^{j*}}{\partial y^{j}}<0$,

where $\chi=\frac{u\left(y^{j}+t^{j*}\right)-u\left(y^{j}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}$.

Proof. See Appendix A8.

The result characterizes the profitability of the clientelistic groups. A change of the members income can lead to lower or higher amount of patronage invested in that group. What determines this is the net expected rate of return of public resources when they are invested in patronage instead of public goods. The intuition is that a group with a higher expected political rate of return of patronage than the expected political rate of return obtained from the whole polity when resources are invested in public goods polity, would be such an important source of revenue, that the incumbent will always try to control it. Then, even if an increase of income within the group rises the co-optation cost of each member, more resources are allocated in patronage to maintain the high benefit this group provides as a client. Thus patronage transfers not necessarily have a negative relation with individual income levels in every case.

Nevertheless, the second part of the result implies that in every case, if income rise enough, patronage decreases until the group becomes non clientelistic.

Incumbent Efficiency

Usually inefficient governments are linked with clientelistic strategies. Intuitively it is expected that a greater efficiency to provide public goods, leads to more investment on these and therefore patronage would be reduced. If political preferences could be observable certainly that would be the case but when patronage is used to improve the expected support, this is not necessarily true, at least within some particular clientelistic groups. The outcome of a more efficient incumbent over patronage transfers

depends on how this affects the relative average density. A greater efficiency will always shift the swinger member of every clientelistic group such that the expected return of public goods investment raises and the expected revenue increases. A relocation of resources will follow. But note that it can be the case that within some groups this shift increases the density of the swinger member and therefore the return of patronage also increases and then it is possible that additional resources invested in patronage will lead to an important increase of the expected profit. To show this process I will introduce Assumption 1 once more.

Result 4 Under Assumption 1,

i) if in an equilibrium the swinger member of the clientelistic group *j* is such that $f^{j'}(\chi) \leq 0$, an increase on the incumbent effectiveness to provide public goods leads to a reduction on the patronage transfer for that group.

ii) if in an equilibrium the swinger member of the clientelistic group *j* is such that $f^{j'}(\chi) > 0$, an increase on the incumbent effectiveness to provide public goods leads to a reduction on the patronage transfer for that group if $\frac{f^{j'}(\chi)}{f^{j}(\chi)} < \frac{2\left(b^{*}-a^{*}\right)u'\left(y^{j}+t^{j*}\right)}{Kg\left(u'\left(y^{j}+t^{j*}\right)-KT\alpha^{j}\right)}$ (0.17). The patronage transfer does not decreases if $\frac{f^{j'}(\chi)}{f^{j}(\chi)} \geq \frac{2\left(b^{*}-a^{*}\right)u'\left(y^{j}+t^{j*}\right)}{Kg\left(u'\left(y^{j}+t^{j*}\right)-KT\alpha^{j}\right)}$ (0.18), and it increases if the condition holds with strict inequality.

Proof. See Appendix A9.

An increase of the incumbent's effectiveness to supply public goods always has a positive effect on the political return of public goods investment. When a greater effectiveness leads to a decrease of the swinger member density, the return of patronage decreases and therefore resources are relocated from patronage to public goods. This is what the first part of the result shows. When an increase on incumbent's effectiveness has a positive effect on the winger member density, both patronage and provision of public

goods increase their political returns. The intuition behind conditions (0.17) and (0.18) is that if the effect on the return on patronage is greater that the effect on the return of public goods supply, the incumbent will invest more resources on patronage within that clientelistic group. Note that this does not imply that the total amount of resources invested in patronage increases, but just that the incumbent can consider convenient to raise the patronage transfers for some specific clientelistic group. Under Assumption 1, for example, if *j* would be the only clientelistic group and (0.18) holds with strict inequality, then total patronage will raise, but if there are more clientelistic groups this is not necessarily the case since the transfers for these other groups would fall.

Ideological Distance and Ideological Bias

When the political parties assume similar platforms, the use of policies and strategies to differentiate them self from their rivals becomes more important. It is also the case that the relative position of both platforms over the ideological line, changes the effectiveness of the parties' strategies. This means that given the ideological distance of the platforms, if the population preferences increase their ideological bias towards some party the political return of their strategies change. These ideas are depicted by the model related to the use of patronage and public goods. Assumption 1 is once more a useful setup to show this.

Changes in both the ideological bias and the ideological distance of the programs affect the relative average density of each clientelistic group and each non clientelistic group around the pivotal point. Under Assumption 1 the relative average density of the clientelistic group *j* becomes

$$\frac{1}{\Phi^{j*}} = \alpha^{j} + \frac{\sum_{h}^{-j} \alpha^{h} \phi^{h}}{f^{j}\left(\frac{u\left(y^{j} + t^{j*}\right) - u\left(y^{j}\right) + Kg^{*}}{2\left(b^{*} - a^{*}\right)} + \frac{b^{*} + a^{*}}{2} \right)}.$$

Note that $\frac{b+a}{2}$ is the midpoint between the political platforms over the ideological space. If the midpoint increases given the ideological distance, the swinger member position changes to a closer location from the opposition. This means that within the

group, and given the investment on patronage, the members become more biased to the incumbent and then its expected support within the group increases. The effect on patronage depends once more on the change of the swinger density.

A similar effect occurs when, $b^* - a^*$, the ideological distance change. Given the ideological bias, if the distance is reduced the political parties become more alike and therefore the utility differences of supporting one or the other are reduced. This implies a greater revenue of both, patronage and public goods supply. The final effect depends on the difference on the changes of these two ways to obtain political revenue. This is shown in the next result.

Result 5 Under Assumption 1,

i) If $f^{j'}(\chi) > 0$, then the political bias to the incumbent, $\frac{b^* + a^*}{2}$, has a positive effect on patronage transfers and the ideological distance, $b^* - a^*$, has a negative effect on patronage transfers for the clientelistic group.

ii) if $f^{j'}(\chi) < 0$, then the political bias to the incumbent, $\frac{b^* + a^*}{2}$, has a negative effect on patronage transfers and the ideological distance, $b^* - a^*$, has a positive effect on patronage transfers for the clientelistic group.

Proof. See Appendix A10.

4 POVERTY AND INCOME DISTRIBUTION

Patronage and clientelism are associated with inequality and poverty. In general it is considered a characteristic of "traditional societies" and developing economies, which usually have low per capita incomes and high inequality. The model address these issues and provide some important insights.

To consider income distribution let *Y* be the total disposable income for this economy. Income distribution is given by a set of parameters $\{\beta_1, \beta_2, ..., \beta_J\}$ that

represent the income shares for each group *j*; group *j* has a share β_j of the total disposable income *Y* which is equally distributed within the members of the group. Then each member of group *j* has an income $\frac{\beta_j}{\alpha_j}\bar{y}$, where $\bar{y} \equiv \frac{Y}{T}$ is the per capita income level in the economy. Then in an interior equilibrium, the members of clientelistic group *i* receives a patronage transfer,

$$t^{j*} = u'^{-1}\left(\frac{K\sum_{h=1}^{J} T\alpha^h f^h\left(\frac{u\left(\frac{\beta_h}{\alpha_h}\bar{y} + t^{h*}\right) - u\left(\frac{\beta_h}{\alpha_h}\bar{y}\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)} \right)}{f^j\left(\frac{u\left(\frac{\beta_j}{\alpha_j}\bar{y} + t^{j*}\right) - u\left(\frac{\beta_j}{\alpha_j}\bar{y}\right) + Kg^* + b^{*2} - a^{*2}}{2\left(b^* - a^*\right)} \right)} \right) - \frac{\beta_j}{\alpha_j}\bar{y} \quad (0.19)$$

Note that the transfer for the members of each clientelistic group depends not just on their individual disposable income but on the way the rest of the total income is distributed among other groups.

Result 6 If income distribution and total disposable per capita income in the economy are such that the income level for a member of group *j* is sufficiently high, relative to the highest political relevance that the group as a client could have with respect to the rest of the citizenry, this group will never become a clientelistic one.

Proof. It follows straightforward from Result 1 and (0.19) that if the members of group *j* have an income level $\frac{\beta_j}{\alpha_j}\bar{y} \geq u'^{-1}\left(\frac{TK\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)} \right)$, where m^j is the median for distribution f^j and $x_m = \arg\min_x \sum_{h=1}^{J}\alpha^h f^h\left(x\right)$, then it is always the case that $t^{j*} = 0$. □

Such a high income implies that, given the budget constraint, this group will always be more interested I public goods than in patronage if resources were relocate. The reduction of public goods that would follow any positive patronage transfer to the group, would cause a decrease of welfare to its members. Then the group will pay a greater political support if resources were invested in public goods. When this is the case for any possible combination of programmatic positions and allocation of resources, then this group would never become a client. If this is a generalized position in the economy, patronage is null. This is stated in the following corollary.

Corollary 4 If income distribution and total disposable per capita income in the economy are such that the poorest citizen's income is sufficiently high, there is no patronage in the economy.

Proof. Since the maximum value of Φ in the economy is given by $\left(\max\left\{f^j\left(m^j\right)\right\}_{h=1}^{J}\right)^{-1}\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)$, from (0.19) and Result 6 it follows straightforward that if $\min\left\{\frac{\beta_j}{\alpha_j}\bar{y}\right\}_{j=1}^{J} \geq u'^{-1}\left(\frac{TK\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)}{\max\left\{f^h\left(m^h\right)\right\}_{h=1}^{J}}\right)$, then it is always the case that $t^{j*}=0$ for every j. □

I will call the two thresholds, $u'^{-1}\left(TK\left(f^j\left(m^j\right)\right)^{-1}\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)\right)$ and $u'^{-1}\left(TK\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)\left(\max\left\{f^j\left(m^j\right)\right\}_{j=1}^{J}\right)^{-1}\right)$(0.20), the ***critical income levels*** for group j and for the whole the economy respectively.

It is important to note that these critical levels are not related with poverty lines or poverty levels and they do not contain any information about some minimum consumption level.

The critical levels are important indicators for the competitors since they reflect the political relevance that some group has as a clientelistic one, with respect to the rest of the citizenry. Also note that they are independent of the ideological distance, the ideological bias and the level of public goods' expenditure. Thus, when the poorest individual in an economy has a sufficiently high income, co-optation is so costly that the political return of patronage is always less that the return of political competition and the provision of public goods. Then the incumbent would never use patronage to gain support within the citizens. However, this does not imply that any group with an income below the it's critical level, will automatically become a clientelistic group. Result 6 just says that if that occurs, then the group will be considered a potential client.

The critical levels are determined by the minimum relative density, the size of the population and the incumbent's efficiency to provide public goods. When the critical levels raise, the probability to be targeted as a client increases for any group with an income below these lines.

If the ideological volatility decreases for some group, the likelihood to be targeted as a client increases since the expected payoff from that group is higher with low dispersion. Therefore, the lower the ideological dispersion is, the grater the income level must be in order to maintain a group independent of patronage. When the population increases it is more costly to co-opt any group since the number of members increases in the same proportion that the population. Then, the likelihood to be co-opted is less. If the number of members changes due to a relocation of agents between different groups, the same effect takes place. When the size of any group is reduced because a migration of its members, then co-optation is less costly and the probability of become a client increases. Finally, a more efficient incumbent would find less profitable the use of patronage, shifting the critical lines to lower levels.

It is also clear that if the aggregate income in the economy is high enough, every citizen will be above the critical line and there won't be any chance to co-opt somebody. The next corollary follows.

Corollary 5 Given any income distribution with $\beta^j > 0$ for every *j*, if per capita income is high enough there is no patronage in the economy.

Proof It follows directly from Result 6. □

Result 3 shows the conditions under patronage transfers for some clientelistic group have a positive relation with the group's income level. Therefore the possibility of a decreasing of patronage transfers when a group becomes poorer exists. Nevertheless it would be a mistake to interpret this result as a negative relation between patronage and poverty since the critical income level is not related with poverty measures. Result 3 refers to a particular group which is already a clientelistic one. When the whole economy becomes poorer, given some income distribution, patronage resources can be relocated within the clientelistic groups, but in general sufficient income reduction in the economy would increase the number of potential clients shifting some groups from a non clientelistic position to a clientelistic one.

These results give insights about the relation of patronage with the income level of the citizens and the aggregate economy, but actually it does not tell us anything the relation of clientelism and poverty. To analyze this relation it is necessary to draw a concept of poverty. Here I will just assume that there is a minimum income level necessary for the surviving of any citizen. Then without loss of generality I assume the following.

Assumption 2 The utility derived from the private consumption for any citizen *i* is given by the following utility function $\hat{u}\left(y|\tilde{y}\right)=\begin{cases}u\left(y-\tilde{y}\right) & \text{if } y\geq\tilde{y}\\ u\left(0\right) & \text{if } y<\tilde{y}\end{cases}$, where $\tilde{y}>0$ is the minimum income level which determines the poverty line.

Result 8 Given the per capita income level of the economy and the income distribution, then any citizen with an income level below the poverty line is always a potential client.

Proof. See appendix A11.

Income level is determined by per capita income and the wealth distribution. Thus per capita income is an important determinant of the use of patronage as a political strategy, but it's its combination with the way it is distributed along the economy what really determines the use of patronage.

However, inequality effects over patronage are ambiguous. To show this I will simplify the model with the next assumption.

Assumption 3 Every group has exactly the same uniform distribution.

This assumption implies that the relative average density is constant and the critical income level is the same for every citizen, therefore it rules out the effects caused by the changes in the swinger member density but it does not modify the analysis' insights.

Let group i be any clientelistic group where $i=1,2,...,I$ and $I \leq J$. The total amount of public resources invested in patronage is then $p = Tu'^{-1}(KT)\sum_{i=1}^{I}\alpha_i - Y\sum_{i=1}^{I}\beta_i$ (0.21). It is clear that any redistribution from a clientelistic group to a non clientelistic group will raise total patronage. Note that with this kind of income redistribution, the Lorenz curves for the different distributions don't cross each other, therefore inequality is greater in the final distribution.

Result 9 If inequality change due to an income redistribution from the set of clientelistic groups to the set of non clientelistic groups, then inequality and patronage have a positive relation.

Note that in the case that if the share of the population within the clientelistic groups is greater, then the total amount of patronage also increases but the change in inequality is not clear. A similar situation takes place with redistribution across non clientelistic or clientelistic groups, and from clients to non clients.

In an economy where the poorest citizen has enough income such patronage does not exist, for example, income distribution can change by reducing the income share for some group in a sufficient amount that its members become potential clients. In that situation there is always an incentive to use patronage as a political strategy. In these cases redistribution may modify patronage but it does not necessarily imply a positive or negative relation with inequality. To show this, assume that citizens are distributed in two different groups and that there is a non equalitarian income distribution such that there is no patronage in the economy. Then each member of group 1 will have an income

$y^1 = \bar{y}\frac{\beta_1}{\alpha_1}$ and those of group 2 will have an endowment of $y^2 = \bar{y}\frac{1-\beta_1}{1-\alpha_1}$. Let $\underline{\beta} = \frac{\alpha}{\bar{y}}u'^{-1}(TK)$, thus if income share for group 1 becomes less than $\underline{\beta}$, the group becomes clientelistic.

Suppose the initial distribution is such that $\frac{\beta}{\alpha} > \frac{1}{2}$, with its respective Lorenz curve. Consider an income redistribution where the income share for group 1 is now β'. It is obvious that any redistribution where $\beta' > \beta$, will increase inequality, and the new Lorenz curve is dominated by the initial one. Then if $1-\underline{\beta}' < \frac{\alpha_2}{\bar{y}}u'^{-1}(TK\alpha_2)$, inequality drives to the creation of client-patron relations. But if redistribution is such that $\beta' < \beta$, the Lorenz curves cross each other and therefore inequality change depends on the social welfare function.

Consider for example the Atkinson index with $\varepsilon = 1$. Then for this case the index becomes $I(\beta|\alpha) = 1-\left(\frac{\beta}{\alpha}\right)^{\alpha}\left(\frac{1-\beta}{1-\alpha}\right)^{1-\alpha}$. Note that the index is strictly convex on $\beta \in [0,1]$ for any $\alpha \in (0,1)$, with a unique local minimum, $I = 0$, at $\beta = \alpha$ and with $I = 1$ for $\beta = 0,1$. Since initially $I(\beta|\alpha) > 0$, if $I(\hat{\beta}|\alpha) < I(\beta|\alpha)$, there is always a β', such that $\beta' < \hat{\beta}$ and $I(\beta'|\alpha) < I(\beta|\alpha)$. Therefore, although inequality decreases, patronage grows.

Consider now the case of an equalitarian poor economy where $Y < Tu'^{-1}(KT)$ with two groups, then $\beta = \alpha$ and both groups are clientelistic with $t^{j*} = \bar{y}$, where $j = 1,2$. Total patronage is then $p = Tu'^{-1}(KT) - Y$. Note that if any of these groups get an income $y = u'^{-1}(KT)$ then it won't be a client any more.

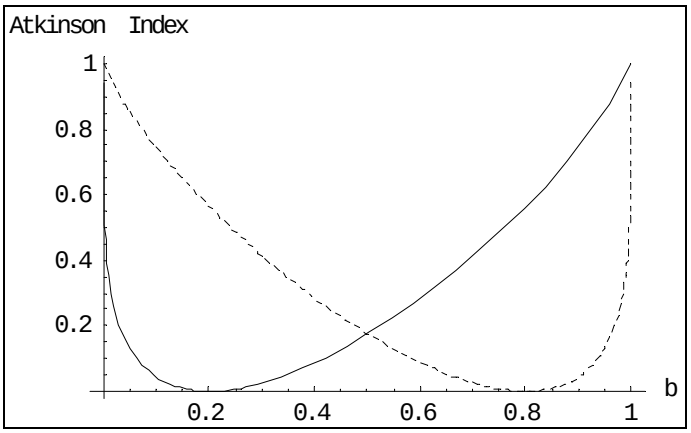
Consider now an income redistribution such that now $\beta_1 = \alpha_1\frac{u'^{-1}(KT)}{\bar{y}}$, group 1 can not be co-opted any more and the members of group 2 become poorer and then just

this group maintains a patron-client relationship. With the new distribution, $t^{1*} = 0$ and $t^{2*} = \dfrac{\overline{y} - \alpha_1 u'^{-1}(KT)}{1-\alpha_1}$, but note that total patronage is still the same $p = Tu'^{-1}(KT) - Y$. It is clear that inequality grew but the total resources used in patronage did not change.

It is important to note that despite there is no change in the public goods supply, inequality may drive to a reduction in the size of the clientelistic population. This implies that a larger number of citizens are able to formulate their political preferences without the threat that patronage and clientelism imply in many occasions. This also implies fairness increase for competition within the political arena. In these grounds the normative position would be to redistribute from the minority group to the majority.

In the analysis no assumption about the population shares was made, but in any case, either $\alpha_1 > \alpha_2$ or $\alpha_1 < \alpha_2$, inequality grows. Once more, to compare the inequality levels in each case it is necessary to specify a social welfare function.

Figure 1



Atkinson Index as a function of β

Appling once more the Atkinson index with $\varepsilon = 1$, inequality is monotonically increasing on α_1 for $\beta_1 = \alpha_1 \dfrac{u'^{-1}(KT)}{\overline{y}}$. Therefore, according with the index, a more unequal distribution minimizes the number of citizens involved in a patron-client relation,

while a less unequal distribution maintain the majority under patronage. Note that in this example the higher level of the Atkinson index responds to the income difference between the two groups. When the redistribution provides the critical income to the minority, the majority become much less poorer than the minority when it pays for the critical income of the majority. Nevertheless, if the redistributed amount goes further from the critical income level, this same social welfare function confers a higher inequality level the greater wealth concentration is in a minority group. This is shown in Figure 1.

Figure 1 shows the Atkinson Index levels as function of the income share for group 1, β. The continuous line shows the index values for the case where redistribution goes from the majority group to de minority, $\alpha = 0.2$, and the grid line is for the opposite case, $\alpha = 0.8$. It is clear that if more than a half of total disposable income is concentrated within the minority, inequality is always greater when is redistributed from the majority to the minority group. In that case not just inequality is higher but, according with (0.21), patronage also increases in a greater amount.

Thus, the model shows that a relation between the use of patronage as a political strategy and income distribution is ambiguous, and that the income level is more directly related with patronage. What is possible to conclude is the following.

Result 10 If an income redistribution increases the number of citizens with an income below their critical levels, then the expected number of clients within the polity increases while if less citizens have an income below the critical level the expected number of clients decreases. In any of these cases neither the change in the amount of resources invested in patronage nor the change of the inequality measures, have a defined direction.

5 COMPETITIVNESS AND PATRONAGE; A GENERAL EQUILIBRIUM APPROACHE

In this section I ask what the consequence of a more competitive political system over the allocation of public resources to build patron-client relations is. The question is motivated by the idea that more competitiveness within the political arena will

produce more efficient results which implies the reduction of patronage. Nevertheless, there is evidence that this is not necessarily the case (Moreno 2005).

In the previous section I show the circumstances where a stronger opposition, which can modify the swinger point by changing the ideological distance or the mid point between the competitors, leads to an increase in patronage investment. That analysis, whoever, does not consider the secondary effects of the patronage investment over the ideological positions of the parties. An increase in patronage discourage the opposition to compete and can reverse the initial effect. Here I show the conditions under a more competitive party system will lead to a greater use of patronage.

As equation (0.15) suggests, the final effect depends on the sensitivity of the relative density of each client. To clarify the mechanism it is useful to make following assumptions. Notice that the assumption does not places further restrictions on the clientelistic group's density and the rest of the agents' characteristics.

Assumption 4 Every group has a uniform distribution except group *j* which is the only clientelistic group with a continuously differentiable p.d.f., $f^{j}(\cdot)$, over $[0, L]$. The costs for the parties are such that $C_A'(a) = C$ for any *a*, and $C_B'(L-b) = \gamma C$ for any *b*, where *C* is a positive constant and γ is a positive parameter which determines the competitive advantage of the incumbent.

Assumption 4 implies that any adjustment of the relative density does just depend on the changes of the clientelistic group's density. This simplifies the algebra without lost of generality and clarifies the adjustment mechanism. When parameter γ is close to one, the political parties compete in more equalitarian conditions and then the political system is more competitive. On the contrary the grater is γ, the less competitive is the political system.

I will depart from an interior equilibrium where political parties compete signaling political platforms with location other than the parties' ideal positions and where the incumbent invest in both patronage and public goods. Then, according with Assumption 4, the conditions for an interior solution are:

$$C=\pi T\sum_{h}^{-j}\alpha^{h}\phi^{h}\left(\frac{1}{2}+\frac{Kg}{2\left(b-a\right)^{2}}\right)+\pi T\alpha^{j}f^{j}\left(\chi\right)\left(\frac{1}{2}+\frac{u\left(y^{j}+t^{j}\right)-u\left(y^{j}\right)+Kg}{2\left(b-a\right)^{2}}\right),\qquad(0.22)$$

$$-\gamma C=\pi T\sum_{h}^{-j}\alpha^{h}\phi^{h}\left(\frac{1}{2}-\frac{Kg}{2\left(b-a\right)^{2}}\right)+\pi T\alpha^{j}f^{j}\left(\chi\right)\left(\frac{1}{2}-\frac{u\left(y^{j}+t^{j}\right)-u\left(y^{j}\right)+Kg}{2\left(b-a\right)^{2}}\right),\qquad(0.23)$$

$$f^{j}\left(\chi\right)\left(u'\left(y^{j}+t^{j}\right)-KT\alpha^{j}\right)=KT\sum_{h}^{-j}\alpha^{h}\phi^{h},\qquad(0.24)$$

where $\chi\equiv\dfrac{u\left(y^{j}+t^{j*}\right)-u\left(y^{j}\right)}{\left(b^{*}-a^{*}\right)}+\theta^{*}$ (0.25).

Notice that since with the exception of group *j* the rest of the groups have a uniform distribution, the right sides of conditions (0.22) and (0.23) are not necessarily continuous nor monotone on *a* and *b* respectively. Then it is convenient then to make a last assumption.

Assumption 5 $\left[\psi^{i}-\frac{1}{2\phi^{i}},\psi^{i}+\frac{1}{2\phi^{i}}\right]\bigcap\left[\psi^{h}-\frac{1}{2\phi^{h}},\psi^{h}+\frac{1}{2\phi^{h}}\right]=\varnothing$ for any groups *I*, *j* and $\left[0,L\right]\subset\left[\underline{\varsigma},\bar{\varsigma}\right]$ where $\underline{\varsigma}$ is the maximum element of the sequence $\left\{\psi^{h}-\frac{1}{2\phi^{h}}\right\}_{h}^{-j}$ and $\bar{\varsigma}$ is the minimum element of the sequence $\left\{\psi^{h}+\frac{1}{2\phi^{h}}\right\}_{h}^{-j}$.

This assumption implies that $\sum_{h}^{-j}\alpha^{h}\phi^{h}$ is constant over the interval $\left[0,L\right]$ then there are no jumps of this weighted average density when the swinger point change and then the marginal revenue of political competition for each party is continuously differentiable on the ideological position of its platform. Moreover, Assumption 4 guarantees that the changes in the relative density are smooth allowing a static comparative analysis. From Assumptions 4 and 5, the next lemma follows.

Lemma 2 Given Assumption 1 and 4, an interior equilibria implies (0.22), (0.23), (0.24) and $\frac{f^{j\prime}(\chi)}{f^{j}(\chi)} < -\frac{4\alpha^{j}\left(b^{*}-a^{*}\right)\left(u'\left(y^{j}+t^{j*}\right)\left(1+\frac{g^{*}}{\alpha^{j}T}\right)-u\left(y^{j}\right)\right)}{\left(\left(b^{*}-a^{*}\right)^{2}-u\left(y^{j}+t^{j*}\right)+u\left(y^{j}\right)-Kg^{*}\right)^{2}}$ (0.26), where χ is defined by (0.25).

Assumption 4 guaranty continuity and differentiability of the marginal revenue, but this is not monotone and since marginal cost is constant there exist multiple solutions for conditions (0.22) and (0.23), but not all of them can be sustained as an equilibrium. This implies that there can be different ideological platform combinations that equalize the marginal revenue of political competition and the marginal cost, but not all of them are profitable for the parties and won't be sustained as equilibria.

The general equilibrium analysis is consistent with the partial equilibrium results where if the clientelistic group is an important supporter for the incumbent, this would try to maintain its support when the system becomes more competitive by investing more in patronage.

Result 11 The allocation of resources in patronage is greater when the political system becomes more competitive if in the equilibrium the clientelistic group's density, $f^{j}(\chi)$, is such that $f^{j\prime}(\chi) < \rho_1$. Patronage decreases when the political system becomes more competitive if $f^{j\prime}(\chi) \in (\rho_1, \rho_2)$, where ρ_1 and ρ_2 are defined by the following:

$$\rho_1 = \frac{-\frac{\Gamma\left(u'\left(y^{j}-t^{j*}\right)-\alpha^{j}KT\right)^{2}}{2\left(b^{*}-a^{*}\right)}-\sqrt{\frac{\Gamma^{2}\left(u'\left(y^{j}-t^{j*}\right)-\alpha^{j}KT\right)^{4}}{4\left(b^{*}-a^{*}\right)^{2}}-4\alpha^{j}\Psi f^{j}(\chi)u''\left(y^{j}-t^{j*}\right)}}{2\alpha^{j}\Psi}$$

$$\rho_2 = -\frac{\Gamma}{2\alpha^{j}}\left(\frac{1}{2}-\frac{u\left(y^{j}+t^{j*}\right)-u\left(y^{j}\right)+Kg^{*}}{2\left(b^{*}-a^{*}\right)^{2}}\right)^{-2},$$

where $\Gamma \equiv \dfrac{\alpha^j \left(u\left(y^j - t^{j*}\right) - u\left(y^j\right) + kg^*\right) f^j(\chi) + Kg^* \sum_{-j} \alpha^h \phi^h}{\left(b^* - a^*\right)^3}$ and

$$\Psi \equiv \left(\frac{1}{2} + \frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + kg^*}{\left(b^* - a^*\right)^2}\right)^2 \left(\frac{1}{2} - \frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + kg^*}{\left(b^* - a^*\right)^2}\right)^2 .$$

Proof. See Appendix A12.

Notice that $\rho_1 < \rho_2 < 0$ is always the case. What this formal statement says is that when the swinger member of the clientelistic group is around the mode or on a broader interval of the decreasing part of the density function near the mode, an increase on the competitiveness of the system leads to a greater investment in clientelism. In an equilibrium where the swinger member is in such location, the incumbent invest in patronage in such a way because the group is an important revenue source and therefore the incumbent will try to keep the support of the group.

6 Concluding Discussion

Summarizing, in this paper I develop a formal model where an incumbent party confronts an opposition in a political arena and where the ideological preferences of citizens are private information. Parties compete programmatically considering a probabilistic distribution of ideological preferences; however, they face a cost of competing by deviating from their ideological program given by their internal structures and the institutional settings of the political system. When the system becomes more democratic, the opposition's cost to compete programmatically decreases given their costs caused by its internal structure.

The incumbent can also use public resources in patronage to gain the support of programmatic opponents. However, the incumbent faces an agency problem when allocate public resources in the supply of public goods and the supply of patronage since ideological preferences are not publicly observed and citizens would act strategically to increase their private consumption. Thus, the allocation of patronage is based on the

possibility of separate the society in ideologically oriented groups, according with some observable characteristics, including income.

Furthermore, the use of patronage implies fewer resources to invest in public goods and therefore a loss of support within the programmatic supporters and other clientelistic groups. Then, the incumbent target those groups that considers strategically convenient to maximize her expected political profit, taking into account the co-optation cost relative to the expected political revenue for each group. Thus, even though some citizens would be prone to become clients, they won't be unless demand and supply of patronage match.

Given this setting, the leading idea of the theory, is that patronage is determined by the relative political relevance that each group has as a supporter and not just by the cost of co-potation driven by the private consumption utility function of the citizens, their productivity or wealth, and their political preferences as other analytical theories argue (Robinson and Verdier 2002; Estevez, et al. 2002; Medina and Stokes 2002).

The model abstracts from any cultural issue and take them as given, but it would be completely mistakable to deny the important implications of culture. However, I think the insights provided by a theory built over the most basic and general characteristic of patron-client relations, the exchange of political support for excludable public decisions patron-client relations based on the purely mechanism of exchange, are still valid and correct.

I also sustain that a theory of patronage and clientelism not just need to explain this type of practices in poor or developing countries or communities, but also have to account for the dynamics of this kind of relations in developed economies. The model contributes to explain cases like England, Canada or France where political parties have flirted with the use of clientelism (O'Gorman 2001, Warner 1998) or Island where clientelism is an important political strategy, and also can explain the dynamics of "modern" interest groups in developed countries.

This idea is similar to Shefter's (1994) since it's based on a supply-demand relation; however, the mechanisms of the two theories are different. Since I build a theory where personalism and dyadicity are not necessary characteristics of patron-client relations, I suggest that political parties recognize potential clients within the whole set of

citizens who demand patronage. Potential clients are those individuals that will exchange their support for private consumption even though this implies a reduction on their consumption of public good. I argue then that the supply of patronage match the potential demand depending on three main issues: the ideological bias of the group, its ideological volatility and the relative value citizens give to private consumption and public goods which depends on their income level.

Ideological Bias

Any agent would be better off if her income rises independently of her initial wealth, and therefore any citizen is prone to sell at some price her political support. This depends not just on a demand of consumption goods but on a subjective valuation of the political activity. Ideology is then an important issue in the dynamics of patronage. The more bias toward the opposition, the greater will be the cost of co-optation. Therefore, clientelism would be less costly within groups around the pivotal position; this is, within groups which members may be supporters of the incumbent. Nevertheless, it is not true that these groups are always clients. In many occasions parties try to use patronage to co-opt opposition groups even though this is more expensive. The model shows that if these groups are considered relatively more important potential supporters, the incumbent will make patronage investments on them. Many opposition groups are organizations of citizens that have an active political life, they are easily monitored and their ideological dispersion is low. These groups are generally an important source of political revenue since they can be organized and can act as activists. Other opposition groups are not necessarily organized but can be monitored, like intellectuals and artists, and are an important source of public opinion. Thus these groups are in many cases strategically more relevant than other groups within the political arena when parties compete for support, and therefore they are targeted as clients even though their co-optation can be expensive because their ideological bias.

Ideological Volatility

Ideological volatility increases the cost of clientelism when ideological preferences are not observable. The more dispersed is a group, the investment to obtained

a given expected support, must be higher. This makes more attractive organized ideological groups. The less dispersed, the better is the group as a clientelistic one. The model shows that the possibility of divide the society in ideological groups is one of the most important sources of clientelism. If society can not be divided in ideological groups the cost of patron-client relations will be too high unless they are established in a personal way with the possibility of monitor the client's behavior. Under this logic, it's expected that political parties and governments take advantage of social cleavages or implement strategies to divide the citizenry in groups minimizing ideological variance. This provides an explanation to the positive relationship between clientelism and ethnic cleavages, or corporative states that has been observed (see Fearon 2002).

Income

Contrary to most theories and analysis of clientelistic relations that associate it with poverty and therefore with developing economies, I argue that low income is neither a necessary nor a sufficient condition for clientelism. However, extreme poverty is a sufficient condition for patronage.

As in any other analysis of patron-client relations, extremely poor people have a high probability to become clients. However, poverty is a difficult concept and the analysis just treats it in terms of an income threshold. The result is kind of obvious, if agents are below the poverty line they practically don't care about public goods but about their private consumption that allows them to survive. The parties find these groups very attractive since with a minimum investment they can obtain an important political profit even if their ideological dispersion is not low. Moreover, if it is the case that these groups do not care or barely care about ideology, the uncertainty factor disappears making them more attractive because they can be totally co-opted with a minimum patronage investment.

In general low income agents are more easily co-opted than wealthy ones since they are more prone to exchange their political support than a wealthier agent for some given amount of patronage and therefore, clientelism is more profitable within groups with low wealth. This is the logic behind all the analysis that link poverty and clientelism.

My argument, however, suggests that this is not a necessary causal relation.

The fact is that low income groups, although not extremely poor, are not necessarily clients even when their valuation of private consumption would be high, and it's also common to find wealthy clients.

I argue this is possible since an individual or group with low income is not necessarily a potential client and it won't be considered strategically relevant. When wealth is above the subsistence level, the existence of patronage demand does not imply the existence of potential clients independently on their income level. Even though individuals may or may not consider the cost of patronage when they demand it, at the end they will internalize it and this will affect their decision of support the incumbent. Thus, when the incumbent sets her strategy, she also takes into account the negative externalities that patronage produce to the citizenry as a negative shock in the provision of public goods, and to other clientelistic groups when their patronage is reduced. Therefore there is not necessarily an income level or a distributional pattern that explain clientelism.

Under this logic, the model shows that it is possible that for some particular groups, if the incumbent increases patronage the expected support within these groups will fall. This is the case when individual wealth for some citizens and the supply of public goods are such that she would be better off paying taxes to improve the public good, then she won't be able to be co-opted as a client because of the negative effect that patronage has over the public good. Patronage is then harmful for the incumbent in that case.

This theory, therefore, can contribute to explain puzzling cases like the Swedish one, where clientelism is inexistent (Papakostas 2001) even though there are important organized interest associations (Hancock et al. 2003). According with the model, patronage will be null in economies where most citizens have high income, and since they will be better off paying taxes to increase the supply of public goods, it is expected a high tax revenue and a high public expenditure in public goods. This is consistent with

the Swedish experience, with one of the lowest inequality levels, high per capita income, and high taxation and provision of public goods.[4]

On the contrary, if a citizen is be better off by relocating resources from public goods to her private wealth, she is then in a potential client position. Since being a potential client depends not just on wealth level, but on initial provision of relevant public goods for the client, wealthy citizens may also be prone to become clients. Note that the model assumes a pure public good, but the fact is that different groups consume and demand different public goods. Moreover, patronage is demanded and supplied in different forms for different groups and individuals, and then it has different impact over the public good according with its form. Then, when a public decision has a small or null impact on the supply of public goods for some agents, but it does have an important effect over their income, they will always be prone to become clients independently of their income level. Thus, the demand of patronage depends on how its cost is distributed within the different groups in the economy.

The comparative static results also show that an increase on income levels does not necessarily reduces the investment in patronage since an incumbent will find important to maintain the control over strategically groups. This can explain the survival of patronage in economies where income is not necessarily low, like Iceland.[5]

Patronage Externalities

The model does not assume anything more about the way patronage affects the public good than a simple tradeoff caused by the reallocation of resources given the effectiveness of the incumbent to provide public goods. Nevertheless, this gives to the model the flexibility to introduce different interpretations such as the way patronage affects economic growth or development. Culturally, patronage can be considered a non desirable behavior in some societies and it harms social welfare. In the model this externality can be captured in the public good variable. Some patronage strategies can also easily turn into corruption and are associated with illegal behaviors that harm social

[4] The GNI per capita (Atlas Method) in 2003 was 28,840 US dollars. Paid taxes and total government expenditure as percentage of the GDP in 1998 were 52% and 56.2% respectively. The evolution of the Gini coefficient was 24.3 in 2000.
[5] GNI per capita in 2003 was 30,810 USD.

welfare. But some times patron-client strategies can have a positive effect over social wealth, like alleviation poverty programs. In many models of redistributive politics and growth, patronage as a redistributive policy would harm economic growth, since clientelism would be related in these models with poor and inefficient groups. But the fact is that efficient entrepreneurs sustain client-patron relations with elected officials in European countries and the United States. Then it would be difficult to sustain that this kind of relation is necessarily harmful for economic growth or social welfare. Thus, patronage is not necessarily economically inefficient even though, I think, is not politically desirable.

Government Efficiency

Inefficient governments are prone to use patronage as a political strategy. Nevertheless, this doesn't mean that a more efficient incumbent will tend to use less patronage in every clientelistic group. The model shows that in such a case resources are relocated changing the relative profitability of different groups and therefore it is possible to increase political revenue by supplying more public goods and increasing patronage within some group by transferring resources across the different clients.

However, since inefficient governments will benefit more from clientelism, they also get an advantage if income settles in a low level within the clientelistic groups.

Some literature about redistributive policies and growth assume complete and competitive labor and capital markets. Therefore, individual income depends on individual productivity and technology.

Here I do not assume anything about issues like individual productivity or informal technologies of production (e.g. Robinson and Verdier 2002) to determine individual income and therefore the use of clientelism.

In fact I think it is a mistake to assume that patronage is driven by exogenous productivity patterns since in most of the cases these are endogenous to the dynamics of clientelism and patronage. As Medina and Stokes (2002) argue, governments have some degree of monopoly power over certain productive technologies and this is what determines the difference in bargaining power between patron and client that many analyses on clientelism observe. Governments control and regulate markets and this

affects the distribution of resources and productivity within a society. The model shows there can be cases where a decrease of wealth within some groups increases the use of patronage and the political revenue of the incumbent. Therefore, as Medina and Stokes (2002) argue, there can be an incentive to harm wealth within the groups in which political profit does not depend on their income level and therefore some forms of inequality are also desirable. The survival of inefficient governments depends then on the reproduction of low income groups.

Income Distribution

Although inequality has been related constantly with clientelism, this relation hasn't been explained. In this model there is not a unique causal relation between inequality and clientelism.

I argue that income inequality is not necessarily a source of clientelism nor low inequality determines an eradication of patron-client relations. The relation between income inequality and patronage depends on the specific pattern of distribution and the groups of citizens, given other structural an institutional characteristics, who find in that pattern an income such that they will be better off by transferring resources from public goods to their personal income.

Under some conditions, the model shows that inequality increases patronage investment and the expected political profit of the incumbent. Then inequality can benefit the incumbent, in particular if it is inefficient and therefore governments can have an incentive to sustain an unequal income distribution with high cleintelism. This idea has been suggested also by Medina and Stokes (2002). They point out that "the combination of large public sectors with low distributive components is a common feature of poor democracies." (pp. 17). However, this, per se, does not imply high inequality.

In contrast with most analysis of clientelism, the model shows how some unequal distributions may produce more economical and political efficiency, reducing the number of clients and increasing the supply of public goods, when the income effect within the clientelistic groups is considered. This result is also consistent with equalitarian societies with high clientelism like Iceland in contrast with other economies

where inequality is higher but clientelism is lower like the United States and some European countries.

Population Size

The size of the population and the groups are also important determinants of patronage. When the population size is reduced the opportunity cost of co-optation also decreases since political revenue of the supply of public goods decreases. Therefore clientelism is more attractive when the population is small. Moreover, the size of the population determines the size of the groups and small groups usually have less ideological volatility increasing the incentive to the use of patronage. This can help to explain the paradox that Iceland represents. Being both, Iceland and Sweden, countries with similar cultures and structural characteristics, both with institutions created on Scandinavian foundations, Iceland's politics have an important clientelistic component while clientelism in Sweden is practically inexistent. Both present a high income per capita and the absence of great inequalities of wealth, but the Iceland population is less than the 5% of the Swedish.

When the group is too big, the opportunity cost of clientelism within that single group can be high enough to discourage its use. This is possible in economies with a big medium class when it is not organized in smaller groups or corporations. In those cases, their relative importance is low respect to other small groups that are also more easily monitored and therefore with a better response to patronage. This is consistent with some developing countries where the use of clientelism is not massive and relative small, but important interest groups sustain patron-client relations with political parties.

Political Competition

Finally, an important feature of the model is that it can address some insights about the relation between the level of competitiveness within the competitors and the use of patronage. Despite the expected social and political benefits of democratization, and the idea that patronage and clientelism will diminish under the competitive political market that liberal democracy implies, this strategies are present in modern democracies and have survived even after the third democratization wave. More over, some analyses

suggest that the use of patronage can increase when the political the arena becomes more competitive (Moreno, 2005).

This behavior is explained by the model when clientelistic groups are an important source of political support and therefore the incumbent will prefer to maintain their control instead of trying to compete programmatically and by supplying public goods.

In conclusion, this analytical theory of clientelism formalizes the main characteristics that the informal literature attaches to the patron-client relation providing explanations not just for developing and poor democracies, but also for developed ones. It can help to explain a number of paradoxes that other theories have failed to clarify, particularly for developed democracies, by analyzing clientelism and patronage as a pure relation of exchange of political support for public excludable decisions. It also helps to understand why democratization as a purely process of development of a competitive political market, does not necessarily provide the incentives to diminish the use of clientelism as a political strategy. It offers insights to understand its relation with social segmentation, government inefficiency and low wealth, and their persistence in some societies.

Chapter 2

Trust in the Political System and Government Performance: A Retrospective Selection Model of Competition for Political Support

1 Introduction

This essay uses a formal model to explore the effects of public trust on political actors' performance as office holders. The question is motivated by concerns that public trust in the political system is diminishing and concerns about the relationship between this decline and poor government performance. In contrast with the existing literature, I find that electoral accountability, as one characteristic of democratic systems, can fail in provide the incentives for political actors to engage with better government performance. Public confidence in the political system can encourage political actors to seek for better performances when citizens share a similar trust level for each of these political actors. Surprisingly, when trust in the different political actors is not so similar, performance can be negatively affected by a greater confidence in the political system as a provider of accountability mechanisms.

In this first part of the essay I introduce the research question, summarize the theoretical model and justify the main assumptions on which the model relies to approach the problem. There follows the making of the formal model and the analysis of the different equilibria that can emerge under perfect and imperfect information. Finally I discuss the main implications of the model.

A democratic system is characterized by the possibility to challenge an incumbent in fair and free competition, and the acceptance of any result by all the

political competitors. According with Dahl (1971) a main characteristic of a democratic system is "the continuing responsiveness of the government to the preferences of citizens". One of the expectations of a democratic process is, therefore, that accountability by democratic elections would provide the incentives for reputation building and encourage good performance by elected office holders. However, the last wave of democratization, which began during the early seventies (Huntington 1991) has failed to fulfill this promise (Hakim 2003). Democracy is supposed to increase the degree to which citizens' "voice" in the public sphere are repressed or are allowed to be "heard". This has been expected to be an important influence on whether the accountability necessary for government efficacy will be created. In this context, citizens influence not just *what* should governments do but *how well* will governments be able to carry out their choices.[6] One reason why poor political performance is one of the central problems that has survived the last wave of democratization is its relation to the declining trust in political institutions and politicians among the citizenry (Lagos 2003). Moreover, this trend has not been observed exclusively in the new democracies, and has been reported for European countries and the U.S. (Nye 1997; Nye et al. 1997; Norris 1999).

Most of the literature has focused on the causal effect of poor political performance on the decline in political trust.[7] Some scholars have suggested that the causal relationship points in both directions (Tenzer 1992; Beck 1992 and 1994; Giddens 1998). This paper draws on a formal model to explore the reverse of this causal relationship. That is, how does decline in public trust leads to poor political performance?

There is an important formal literature on accountability, reputation building, and credibility based on the rational behavior of agents.[8] Electoral accountability refers

[6] I do not intend to discuss the measurement of government performance and I consider performance as the success in implementing a political program to obtain the best results. About government performance measurement see for example Fischer (1994), Hatry (1999) or Callahan (2001).

[7] This is basically the idea behind the view of democracy as a mechanism of political accountability. When politicians do not perform as voters expect, politicians are not anymore trustable and this lack of credibility induce voters to sanction them by voting against them (Austen-Smith and Banks 1989; Barro 1973; Fearon 1999; Ferejohn 1986; Fiorina 1981; Manin 1997).

[8] Formal analysis of electoral accountability has an important contribution in Barro (1973). Later extensions of this analysis are Ferejohn (1986) and Persson, Roland and Tabellini (1997). Austen-Smith and Banks (1989), Banks and Sundaram (1993) are other examples of accountability models. About career

to the possibility of constituents to oust an elected office holder when her performance is loose (Ricker 1982). The threat of being expelled form office is supposed to provide incentives for the office holder to act in the interest of her constituents. However this mechanism depends on the possibility of monitoring the rulers' behavior. In a world with perfect information, accountability has no problems (Barro, 1973). Problems arise when constituents do not have perfect information about the behavior of elected agents in government. Some scholars consider that imperfections of the political market lead to suboptimal results (Stigler 1971, 1972; Becker 1983, 1985). Imperfect information gives political actors the possibility and the incentives to extract rents. Accountability, however, allows constituents to reduce these rents (Persson and Tabellini 2000). Other scholars argue that democratic institutions are sufficient to provide the incentives for political actors in office to perform optimally (Wittman 1989, 1995) and that electoral accountability provide incentives for incumbents to expend effort to advance their performance even when this is costly (Austen-Smith and Banks 1989). Since politicians care about their reputations, a competitive political market promotes better government performance and therefore greater social welfare, despite informational asymmetries. Why then have competitive political markets failed to strengthen government performance?

Culturalist and structuralist arguments consider that public beliefs about politics and politicians are fundamental for government performance even in democratic systems (Tenzer 1992; Beck 1992 and 1994; Almond and Verba 1963; Inglehart 1977, 1990, 1997; Putnam 1993, 1995). Reputation is built by the success of policy results and constituents care about policy outcomes (Wright and Berkman 1986); however, it also rests on citizens' subjective beliefs about the personal characteristics of political agents, and beliefs about the political system. Personal characteristics of political leaders have been traditionally considered important factors for selection and legitimization. From the classical legitimization typology of Weber (1984 [1922]: 193-204), to more recent arguments (Fearon 1999; La Ferrara and Bates 2001), characteristics like principledness, honesty, consistency or personal charisma are considered significant elements in the

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concern see for example Holmstrom (1982) and Dewatripont, Jewitt and Tirole (1999a, 1999b) for a discussion on the literature.

building of political support. These characteristics are related with the public perception of government capabilities of the political agent and her commitment with her constituents. So how can public beliefs about the political actors and about the political system affect the incentives that electoral accountability provides?

In this paper, I build a formal model to analyze the effects that public trust in the political system has on government performance. The emphasis is on beliefs about the political *system,* as opposed to beliefs about specific political actors competing within that system. In my simple spatial model, citizens select the political actor they will support retrospectively based on two qualities –the ideological position of the programs that the political actors run, and the performance of such programs. Retrospective voting occurs when voters make political choices based on the observed performance of political actors.[9] In the model I assume the two political actors are two political parties which are represented in the government. Each of them has specific capabilities, runs distinct political programs, and works with varying degrees of effort to influence policy outcomes in accordance with that program. Citizens care about the ideological positions of each party program and about their performance outcome; however, they also consider the behavior of political actors in terms of commitment, meaning the effort which political actors make in advancing their stated program.

Performance outcomes are a function of the capabilities of political actors, the amount of effort they make to advance their programs, and other significant random events, such as a hurricane or drought. Effort and capabilities are not directly observable; however, citizens can make inferences about both of these factors based on their beliefs about the personal characteristics of the political actors and on their perception of performance output. Citizens take into account the effect of random events on performance outcomes when they evaluate the performance of political actors.

Citizens develop a subjective probability relation based on these characteristics that links the political program output with an expected effort level. Then the retrospective selection process consists of updating an initial subjective belief about each party's behavior in light of the observed program performance and random events.

[9] I follow the argument of retrospective voting proposed by Key (1966), and later developed by Fiorina (1981) and Popkin (1991).

To simplify the exposition, I assume beliefs are common knowledge and all citizens share a unique structure of beliefs; they are what Hinich, Khmelko and Ordeshook (1999) refer to as valance issues. Given the trust citizens have for each party relative to its rival, citizens also share some level of trust in the political system as a whole. The level of trust in the political system affects the general structure of beliefs, and does not represent relative gains in trust on the part of one party or another. However, the general trust in the political system as a whole, does affect the expected values of effort that each party obtains from that structure of beliefs.

Parties compete to gain as many supporters as they can by choosing and running a political program. They consider the ideological preferences distribution of citizens to choose their political program, as well as the level of effort they will exert to advance this program prior to the occurrence of random events. Effort is private information. Political competitors consider the structure of beliefs and the way citizens update their beliefs in determining the level of effort they will exert in advancing their program. The level of general trust in the political system affects the structure of beliefs and consequently the behavior of competitors.

The next section is devoted to the development of the basic model. In the third part I characterize the relevant general equilibria to approach the problem. The subsequent two sections analyze the different equilibria that can emerge with perfect information and with imperfect information respectively, and compare the two cases. Finally, in the last section, I go into some concluding remarks.

2 A Formal Model of Retrospective Selection and Political Competition

2.1 Environment

I consider a model in which there are two types of agents, political parties and citizens. There are two political parties, $j = A, B$, that compete for political support within the set of citizens by providing them the realization of a political program. A political program involves a position over a set of different policy issues. The outcome of each program depends on the amount of effort provided to run them and the

occurrence of random events. The citizens don't know how the outcome is produced and how it is really affected by the random shock. Once the outcomes of the parties' administration are realized and observed, each citizen decides to support either *A* or *B*. This decision is based on the order of ideological preferences of the citizen, the quality of the outcomes and the citizen's perception about each party's effort.

2.1.1 Timing

There is a single period consisting of (1) the parties' programmatic decision and the administration of the programs; (2) the program outcomes; and (3) the citizens' decision. At the beginning of the period, the two parties choose simultaneously the programs they will run in office and the amount of effort they will supply to affect the quality of the outcome. Once the parties decide their platforms and the amounts of effort, they run their programs according with this decision. Simultaneously, nature acts randomly affecting the final outcome of the parties' administration. Then social welfare is determined by the parties' performance in government. Once the citizens observe the shock and the outcome, finally each citizen builds an opinion about the commitment each party has with their constituents' welfare and its performance. That is, citizens infer the amount of effort each party provided, based on their subjective beliefs about the parties and the system, and the observed shock and programs' outcomes. At the end, each citizen decides whom to support and each party obtains its respective political payoff by finding out its respective amount of supporters.

2.1.2 The Ideological Space

I assume agents are heterogeneous on their preferences over policy issues. However, following Enelow and Hinich (1984, 1994), citizens, instead of evaluate and compare different political programs as policy vectors, $\omega \in \mathbb{R}^n$, elements of an n-dimensional policy space $\Omega \subset \mathbb{R}^n$, use ideology as a filter that reduce the policy space to a single ideological dimension. Thus, different political programs are linked with specific positions over an ideological line. Each citizen is then assumed to have rational and continuous preferences over the ideological position of the political programs. Preferences are assumed to be single-peaked. Therefore there exist a utility function that

represents the order of preferences for each citizen, based on the distance between the location of a party program over the ideological line and the most preferred ideological position of the citizen. Each citizen in the economy is indexed and located over the ideological line according to her most preferred ideological position and the ideological space is normalized to the interval $[0,1]$.

2.1.3 Citizens

Citizens are assumed to have symmetric, single-peaked utility on the ideological position of the political programs. They are also assumed to be uniformly distributed over the ideological space interval $[0,1]$, each of them indexed by $l \in [0,1]$, where l denotes her ideal ideological position. To keep the analysis simple, the model considers the following utility function on the programs: $u_l(\mu_j) = -(\mu_j - l)^2$, where μ_j is the ideological position of the program embraced by party *j*. Although parties, as organizations conformed by a subset of citizens, have ideal ideological positions, the citizenry just observe the programmatic behavior of the parties which not necessarily coincides with the parties' ideal program.

Thus, citizens choose to support a specific party based on the programmatic position of the parties and their respective outcomes. But citizens also care about the behavior of the parties as office holders and their commitment with the citizens' welfare. Then, citizens consider the quality of the administration as both, the success of the program and the commitment of the party to maximize social welfare. This commitment is reflected on the amount of effort applied by the parties to advance their performance.

Citizens observe the results the competing programs and they can also observe the random events that may affect those results. However, the amount of effort that a particular party applies can be only observed by the members of that party. Then, the citizens can only infer the amount of effort that each party used to influence their program results. To do so, citizens use the available information such as the program outcomes and the observed random shock. The expected amounts of effort given these observed facts, however, depend on previous beliefs about two issues: (1) the performance of the political system to provide mechanisms for political accountability

and (2) the grade of commitment of each party with the citizenry and their ruling capabilities. The final perception of the citizens depends on the confidence they have in the parties and in the political system. Trust, in this context, is then a relevant issue for the selection process.

In the model, beliefs are represented by a subjective probability function. I assume that citizens have a common probability function for each party's effort, given the quality of the outcome, *y*, and the realization of a positive random shock, ε. This function can be considered a posterior density given some prior distributions about the capabilities of each party, $p_j\left(y_j \middle| e_j, \varepsilon\right)$, and their commitment with the citizenry, $p_j\left(e_j\right)$. Then, the posterior distribution is an update of citizens' beliefs about the parties once they get more information from the program outcomes. Beliefs are assumed to be common knowledge; therefore the political parties consider them to decide their strategies.

To simplify the exposition, the posterior distribution is assumed to be a beta distribution with a p.d.f. $f_j\left(e_j \middle| y_j, \varepsilon, t_j\right) = \frac{\Gamma\left(y_j + \varepsilon\right)}{\Gamma\left(y_j\right)\Gamma\left(\varepsilon\right)}\left(\frac{e_j}{t_j}\right)^{y_j - 1}\left(1 - \frac{e_j}{t_j}\right)^{\varepsilon - 1}\left(\frac{1}{t_j}\right)$, where $\Gamma(\cdot)$ is the gamma distribution, e_j, y_j, ε and t_j are the amount of effort, the quality of the outcome, the shock and a trust parameter for $j = A, B$ respectively. Then, the expected value of the amount of effort given the result of the project, the random shock and the level of confidence in party j, is defined by $\frac{t_j y_j}{y_j + \varepsilon}$. A greater confidence in party *j* implies a higher value for t_j. Then, when trust in party *j* grows and the values for the shock and the outcome remain the same, the citizens would always believe that party *j* supplied a greater amount of effort. It is also the case that when the quality of the outcome is greater, the expected value of the amount effort is always higher. In contrast, if the shock is positively high, the citizens consider that the main source of the result's quality is due to the positive effect of the shock instead to the party's effort. In this last case, the citizens would infer that the party made a lower effort.

The assumption of the beta distribution is sufficient but not necessary. The results remain the same for any posterior distribution $\varphi\left(e_j \middle| y_j, \varepsilon, t_j\right)$ increasing on y_j, decreasing on ε and that $\varphi\left(e_j \middle| y_j, \varepsilon, t_j'\right)$ strictly first order stochastically dominates $\varphi\left(e_j \middle| y_j, \varepsilon, t_j\right)$ for any $t_j' > t_j$. The only purpose of assuming a beta is the simplification of notation.

Then, the citizens' utility function is composed by three different elements: (1) their ideological distance from the leaders' projects; (2) the quality of the project's outcome and (3) the expected effort related with the party's performance. The utility that citizen *l* perceive from party *j* is assumed to be expressed by the following function:

$$U_l\left(j \middle| t_j\right) = -\left(l - \mu_j\right)^2 + y_j + \gamma \mathrm{E}\left(e_j \middle| t_j\right),$$

for $j = A, B$, where γ is a constant that weights the significance of government's effort and E is the expectation operator. Thus, once the political programs have been run and the outcomes and the shock are observed, the utility of citizen *l* derived from party *j* is

$$U_l\left(j \middle| y_j, \varepsilon, t_j\right) = -\left(l - \mu_j\right)^2 + y_j + \gamma \frac{t_j y_j}{y_j + \varepsilon}. \tag{27}$$

Each citizen selects whom to support by comparing the utility levels that each party represents for her. Then any citizen *l* defines its preference structure over the set of political parties in the following way: $A \succsim_l B$ if $U_l\left(A \middle| t_A\right) \geq U_l\left(B \middle| t_B\right)$ and $B \succsim_l A$ if $U_l\left(B \middle| t_B\right) \geq U_l\left(A \middle| t_A\right)$.

Note that this is a process of retrospective selection. Then the utility levels just represent the preference relation within the set of political parties, but they do not imply any utility level that the citizens actually gain by supporting a specific party. However, since both parties are office holders, social welfare is a function of the program outcomes. Then, given the structural characteristics of the citizenry, I assume a social welfare function where every citizen has the same weight, $W\left(y_A, y_B, \mu_A, \mu_b\right)$, which is increasing on the program outcomes: $W_{y_A}\left(y_A, y_B, \mu_A, \mu_b\right) > 0$ and

$W_{y_B}(y_A, y_B, \mu_A, \mu_b) > 0$. Since citizens are uniformly distributed and they have the same weight in the social function, then $W_{\mu_A}(y_A, y_B, \mu_A, \mu_b) = W_{\mu_B}(y_A, y_B, \mu_A, \mu_b) = 0$.

2.1.4 Political Parties

It is common that different political parties participate in government, sharing the parliament or the legislature, or coexisting in different local governments. It is also common that in practice, an important number of political organizations like unions and political parties, do not have a unique leadership. Groups, camarillas and factions under different leaderships coexist within the same organizations. The model considers this case. It assumes that there are two political parties which are office holders. These parties coexist and run different non rival[10] political programs that affect social welfare and can be observed by the citizens.

I also assume that parties are not purely predatory since they have programmatic preferences according with their internal structure and composition. Thus, they are located over the ideological space according to their ideal programmatic positions. However, these ideal positions are private information.

Since there are two political parties, they will just care to compete for the support of the citizens located between them over the ideological line. Then, it is possible to assume that the political leaders are located on the extremes of the ideological line which is normalized to one. Then, *A* and *B* are respectively located on points 0 and 1. For the rest of the exposition these locations are called the *status quo* points for the political parties.

Both parties compete to maximize their political support within the citizenry by choosing and running a political program which results depend on the amount of effort applied to manage them. Political support is an asset for the parties. To simplify the exposition I assume anonymity within the citizenry; therefore, the support of any citizen provides the same political revenue independently of her individual preferences.

[10] Here, *non rivalry* is used to denote that both programs can be simultaneously managed by different actors with out interfering with each other. Then, their outcomes are independent

The programmatic position chosen by each party *j* is located at some point μ_j over the interval $[0,1]$. In choosing this position and the amount of effort to manage the program, the parties take into account the political preferences within the citizenry and their beliefs about the parties and the political system. They also consider their own preferences, the cost of effort and the constraints they face to move apart their preferred program.

Although the distribution of citizens' preferences over the ideological line is not observable, the political parties share a probability distribution function, $\pi(l)$ for $l \in [0,1]$, where $\pi(l)$ is the probability that any agent has her most preferred ideological position on *l*. This probability is common knowledge. The political parties then, use this probability distribution to maximize their expected political profit by building their set of supporters over the set of citizens.

Parties are groups of agents with political preferences and interests, although they are not necessarily the same. However, these groups of agents are organized in some way to define the ideal party ideological position. The internal party process of social choice is not the main interest of this essay. Then I simplify the model by treating parties as individual agents with preferences over the ideological line as in Wittman (1973, 1977). Political parties are then assumed to face a cost of deviating from their ideal position: their *status quo*. The cost depends on the composition of the party, its internal organization, and the structural and institutional settings within the political system. These characteristics and settings can provide competing advantages to one party over the other.

The total cost of competing programmatically, depends on the distance between the *status quo* and the ideological position of the programs. Let $c(\mu_A)$ and $C(1-\mu_B)$ be the cost functions for *A* and *B* respectively, with the following properties:

$$c'(\cdot) > 0, \quad c''(\cdot) > 0, \quad c'''(\cdot) < 0 \tag{28}$$

$$C'(\cdot) > 0, \quad C''(\cdot) > 0, \quad C'''(\cdot) < 0. \tag{29}$$

Intuitively this means that parties have diminishing marginal utility and that the difficulty of bargaining a project within the party members to gain more support, is

higher, the greater is the distance from the *status quo*. Bargaining ability may be different for each party and thus the cost of moving the projects over the ideological space may be different for each politician independently of the fairness level of the political system.

Given the chosen political programs, their final outcomes depend on the way the project is managed. Managing the project to obtain better expected outcomes requires greater amounts of effort. The model assumes effort is costly and its cost is given by a function *h(e)* with the following characteristics:

$$h(0)=0,\ \ h'(e)>0,\ \ h''(e)>0\ \ \forall e\in[0,\bar{e}], \tag{30}$$

Parties may also have different management capabilities and therefore effort effectiveness is not necessarily the same for *A* and *B*.

The final outcome of each party administration, however, does not exclusively depend on the party's capabilities and effort but also on a single random shock that affects both parties' administrations. Thus, from the parties' point of view, outcomes are random variables. Results depend positively on the amount of effort and on a random shock that can affect them either positively or negatively. This relationship is characterized by assuming the following function: $y_j = a + k_j e_j + (\varepsilon - \hat{\varepsilon})$ (31) with $k_j > 0$ for $j = A, B$, $\varepsilon \in [\underline{\varepsilon}, \bar{\varepsilon}]$ randomly distributed according with a p.d.f. $g(\varepsilon)$ with $\underline{\varepsilon} > 0$ and $a > 1 + \hat{\varepsilon} - \underline{\varepsilon}$.

The assumption that effort moves linearly the outcome is sufficient but not necessary for the results; any increasing, concave function of *e* will do. The assumption about the intercept guaranties the beta distribution to be unimodal, since a bimodal distribution wouldn't be intuitively correct. Similarly, the random variable ε must be positive in the beta distribution; then, the functional form of the random shock allows the variable to affect the outcome positively or negatively. The model results do not depend on the distribution of the disturbance term, then to simplify the notation it is assumed that $g(\varepsilon)$ is uniform with $\bar{\varepsilon} - \underline{\varepsilon} = \frac{1}{\phi}$, then $a > 1 + \frac{1}{2\phi}$.

These performance and cost functions are common knowledge for both parties but they are not observable by the citizens.

Once the parties run the programs and the outcomes are realized, the respective shares of the population that support each party are given by the citizen who is indifferent on supporting either parties. Let θ be the location for this citizen which in this paper is called the *pivotal* constituent. The share of citizens that support party *A* is then given by $\theta = \frac{\mu_a + \mu_B}{2} + \frac{y_A - y_B}{2(\mu_B - \mu_A)} + \frac{\gamma}{2(\mu_B - \mu_A)}\left(\frac{t_A y_A}{y_A + \varepsilon} - \frac{t_B y_B}{y_B + \varepsilon}\right)$, and the share that supports party *B* is $1-\theta$.

3 Political Competition

In this context each party intent to maximize its political benefit by choosing the political program they will run, and the amount of effort to advance their programs. The parties decide these issues, prior to the occurrence of the random event. Then, in their intent to maximize the political benefit of their administrations, they consider the expected value of the pivotal constituent, $\theta^e \equiv \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \theta(\mu_A, \mu_B, e_A, e_B, \varepsilon) g(\varepsilon) d\varepsilon$. Then, parties' decision is characterized by the solution of the following maximization problem. The objective for party *A* is:

$$\max_{\mu_A, e_B} \ \pi\theta^e(\mu_A, \mu_B, e_A, e_B, \varepsilon) - c(\mu_A) - h(e_A) \tag{32}$$

subject to

$$\begin{gathered} \pi\theta^e(\mu_A, \mu_B, e_A, e_B, \varepsilon) - c(\mu_A) - h(e_A) \geq 0, \\ 0 \leq \mu_A \leq 1, \\ 0 \leq e_A \leq \bar{e}, \end{gathered}$$

and for party *B* is:

$$\max_{\mu_B, e_B} \ \pi\left(1 - \theta^e(\mu_A, \mu_B, e_A, e_B, \varepsilon)\right) - C(1 - \mu_B) - h(e_B) \tag{33}$$

subject to

$$\pi\left(1-\theta^e\left(\mu_A,\mu_B,e_A,e_B,\varepsilon\right)\right)-C\left(1-\mu_B\right)-h\left(e_B\right)\geq 0,$$
$$0\leq \mu_B \leq 1,$$
$$0\leq e_B \leq \overline{e},$$

where:

$$\theta^e=\frac{\mu_a+\mu_B}{2}+\frac{k_Ae_A-k_Be_B}{2\left(\mu_B-\mu_A\right)}+\frac{\gamma\phi\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\left(\frac{t_A\left(a+k_Ae_A+\varepsilon-\hat{\varepsilon}\right)}{a+k_Ae_A+2\varepsilon-\hat{\varepsilon}}-\frac{t_B\left(a+k_Be_B+\varepsilon-\hat{\varepsilon}\right)}{a+k_Be_B+2\varepsilon-\hat{\varepsilon}}\right)de}{2\left(\mu_B-\mu_A\right)} \quad (34)$$ and

π is the relative political value that the support of a single citizen has with respect to effort and program deviation costs. To maintain the notation as simple as possible, in the rest of the paper the relative political value of an individual support is assumed to be equal to one: $\pi=1$.

An equilibrium is then a set $\left\{\mu_A^*,e_A^*,\mu_B^*,e_B^*\right\}$ that solves simultaneously problems (32) and (33).

The next Lemma bounds the set of possible locations for each of the political programs in any equilibrium and describes the position of the constituencies for each of the two political leaders.

Lemma 1 In any equilibrium, $\left\{\mu_A^*,e_A^*,\mu_B^*,e_B^*\right\}$, the ideological position of the political programs are such that $\mu_A^*\leq\theta^e\leq\mu_B^*$ and $\mu_A^*<\mu_B^*$.

Proof: See Appendix B2.

According to Lemma 1, each ruler has a natural area of political influence. If a party has any support within the citizenry, this will come from the citizens located within the closest region of the party's programmatic position over the ideological line. Then, in any equilibrium the expected set of supporters for parties *A* and *B* are represented by the intervals $\left[0,\theta^e\right]$ and $\left[\theta^e,1\right]$ respectively.

Lemma 1 also implies that no party would set its programmatic position outside the interval of the ideological line where its constituents are located; doing this would

imply an excessive cost given the level of political support. In that case it would be possible to obtain the same level of support moving the program towards the party's *status quo*, reducing the deviation cost.

Thus, the analysis can be restricted to the cases where $\mu_A^* < \theta^e < \mu_B^*$, with no lose of generality. Lemma 2 characterizes the conditions for the existence of θ^e in these cases.

Lemma 2 For any equilibrium $\left\{\mu_A^*, e_A^*, \mu_B^*, e_B^*\right\}$ where $\mu_A^* < \mu_B^*$, there is a $\theta^e \in \left(\mu_A^*, \mu_B^*\right)$, if

$$\left(\mu_B^* - \mu_A^*\right)^2 > \max\left\{k_A\overline{e} + \gamma\phi t_A \int_{\underline{\varepsilon}}^{\overline{\varepsilon}} \frac{a + k_A\overline{e} + \varepsilon - \hat{\varepsilon}}{a + k_A\overline{e} + 2\varepsilon - \hat{\varepsilon}} d\varepsilon - \gamma\phi t_B \int_{\underline{\varepsilon}}^{\overline{\varepsilon}} \frac{a + +\varepsilon - \hat{\varepsilon}}{a + +2\varepsilon - \hat{\varepsilon}} d\varepsilon,\right.$$

$$\left. k_B\overline{e} + \gamma\phi t_B \int_{\underline{\varepsilon}}^{\overline{\varepsilon}} \frac{a + k_B\overline{e} + \varepsilon - \hat{\varepsilon}}{a + k_B\overline{e} + 2\varepsilon - \hat{\varepsilon}} d\varepsilon - \gamma\phi t_A \int_{\underline{\varepsilon}}^{\overline{\varepsilon}} \frac{a + \varepsilon - \hat{\varepsilon}}{a + 2\varepsilon - \hat{\varepsilon}} d\varepsilon\right\} \quad (35)$$

Proof. See Appendix B3.

Condition (35) bounds the possible effort levels and the parameters for the quality technology and for the distribution functions, such that the citizen located on μ_A will always get a greater utility by supporting party *A*, and the citizen located on μ_B chooses to support party *B* in any case. Then, θ^e is the share of the population that supports party *A* and $1-\theta^e$ is the expected fraction that supports *B*.

For the rest of the paper condition (35) is assumed, to rule out any equilibrium where all the citizens support a unique party and therefore political competition can not occur.

It is clear that both the expected *pivotal* constituent and its realization are:

i) increasing on μ_A, the location of the program managed by party *A*, and decreasing on μ_B, the location of the program managed by party *B*;

ii) increasing on the amount of effort provided by party *A*, and decreasing on the amount of effort of party *B*.

These characteristics are independent of the level of information that the citizens have about the parties' effort levels.

The characteristics of the equilibria depend on the functional forms and the parameters' values for the costs functions. Next, the possible equilibria are characterized when the parties' behaviors can be observed by the citizens.

4 Complete Information Equilibria

In this case the amount of effort that each political parties expend to advance their performance are observable by every citizen; therefore the expected pivotal constituent, θ^e, is equal to its realization given by $\theta = \frac{\mu_a + \mu_B}{2} + \frac{e_A\left(k_A + \gamma\right) - e_B\left(k_B + \gamma\right)}{2\left(\mu_B - \mu_A\right)}$.

Note that the pivotal constituent depend on ideological deviation of the parties from their respective *status quo*, $\frac{\mu_a + \mu_B}{2}$, and may depend on the ideological differentiation of the competing programs, $\mu_B - \mu_A$.

Parties maximize their political benefit according to (32) and (33). The first order conditions that characterize the different types of equilibria are shown in the Appendix B4.

4.1 Equilibrium without Effort but with Deviation from the Status Quo.

In this case both parties run a program other than their *status quo* but there are no incentives to provide a positive level of effort to increase their performance. This is caused by the costs' functional form, citizens' utility functions, and the magnitude of the political revenue. In such a case, $\frac{k_j + \gamma}{2\left(\mu_B - \mu_A\right)} < h'\left(0\right)$ for $j = A, B$, and the equilibrium is characterized by the following conditions:

$$e = 0,$$
$$E = 0,$$

$$c'\left(\mu_A^*\right)=\frac{1}{2}, \tag{36}$$

$$C'\left(1-\mu_B^*\right)=\frac{1}{2}, \tag{37}$$

$$\theta^e=\frac{\mu_B^*+\mu_A^*}{2}. \tag{38}$$

This means that the cost of increasing political support by expending effort is always greater than the expected political revenue obtained by this mean. In that case since effort level is zero, the outcome of the program only depends on the stochastic shock.

In that case, citizens' choice only depends on their ideological bias towards any of the programs. The share of citizens that supports each party just depends on the locations of the ideological programs and it do not depend on the programmatic difference of the parties. Thus, the size of each constituency depends on the parties' capacity to deviate from their *status quo*.

At this point the model assumes that both parties have the same capabilities to manage the shocks. It is clear, however, that if this ability is different, the most skilled party to manage the shocks will have an advantage over its opponent. If the parties' technology (31), is modified such that $y_j=a+k_je_j+\alpha_j\left(\varepsilon\right)$, then θ^e is not any more equal to θ and the next result follows.

Result 1

i) If $\alpha_A^e=\alpha_B^e$, then $\theta^e=\frac{\mu_A+\mu_B}{2}$ and $c'\left(\mu_A^*\right)=C'\left(1-\mu_B^*\right)=\frac{1}{2}$ (39).

ii) If $\alpha_A^e>\alpha_B^e$, then $c'\left(\mu_A^*\right)<\frac{1}{2}<C'\left(1-\mu_B^*\right)$ and $\theta^e>\frac{\mu_A+\mu_B}{2}$.

where $\alpha_j^e=\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\alpha_B\left(\varepsilon\right)d\varepsilon$.

Proof. It follows directly from (36), (37) and (38), and assumptions (28) and (29). □

If both parties are equally efficient to manage the shocks, then the expected effects of the random shock over the program outcomes are the same for both parties. In that case the expected pivotal position is the mean point between the ideological positions of the competing programs independently of their distance from the *status quos*.

The ideological programmatic positions when both parties are equally capable to manage the shocks are, however, determined by the cost of deviating from the *status quo* and the revenue gained from that deviation. The marginal cost of deviating for both competitors must be equivalent to one half of the per capita political revenue. Thus, the greater the relative per capita political revenue is, the greater is the programmatic deviation of each party from their *status quo* to increase their constituency and their political benefit. Then, the most efficient party to manage programmatic deviations would expect a greater amount of supporters.

If parties have different capabilities to manage the shocks, then the pivotal constituent shifts toward the less efficient party, increasing the constituency of the most efficient party. The constituency magnitude for each party will also depend on their capability to move apart from their *status quo*. However, it is always the case that the most efficient party to manage the shock will have the advantage to deviate from her status quo in such magnitude that she assumes a lower cost, both total and marginal.

The relative characteristics of the cost functions, therefore, determine the relative size of both constituencies. This is shown in the second result.

Result 2

i) If $c(\cdot) = C(\cdot)$ and $\alpha_A^e \geq (\leq) \alpha_B^e$, then $\mu_A{}^* \leq (\geq) 1 - \mu_B{}^*$ and $\theta^e \geq (\leq) \frac{1}{2}$ respectively, and,

ii) if $c'(x) > (<) C'(x), \forall x \in [0,1]$ and $\alpha_A^e = \alpha_B^e$, then $\mu_A{}^* < (>) 1 - \mu_B{}^*$ and $\theta^e < (>) \frac{1}{2}$, respectively.

Proof. It follows directly from (36), (37) and (38), and assumptions (28) and (29). □

If both competitors have the same cost functions and the expected effect of the shock is the same for both, the conditions are symmetric. Therefore the programmatic deviations from their respective *status quo*, are exactly the same, $\mu_A^* = 1 - \mu_B^*$, and therefore they obtain the same political support, $\theta^e = \frac{1}{2}$. However, there is no convergence to the median voter since there is a cost of mobilizing the political program.

When there is a difference in the expected effect of the shock, however, the most efficient party to manage the shocks will need to deviate less from its *status quo* than its rival. This advantage let the most capable party to get a greater expected constituency.

Finally, if instead of different capabilities to manage the shocks, parties face different costs of competing programmatically, that party with a higher cost will compete less aggressively than its opponent and therefore its constituency will be smaller.

4.2 Equilibrium with Positive Effort and no Deviation from the Status Quo

When the cost of programmatic competition is greater than its political revenue, there are no incentives to deviate from *status quo*. In that situation however, parties may find incentives to gain supporters by advancing their performance as program administrators. Then, party competition is based on management performance and parties expend effort to increase the quality of its administration. In that case the following conditions hold:

$$\frac{1}{2} + \frac{e_A(k_A+\gamma) - e_B(k_B+\gamma)}{2(\mu_B - \mu_A)^2} < c'(0) \text{ and } \frac{1}{2} - \frac{e_A(k_A+\gamma) - e_B(k_B+\gamma)}{2(\mu_B - \mu_A)^2} < C'(0),$$

and the equilibrium is characterized by $\frac{k_j + \gamma}{2} = h'(e_j^*)$ (40) for $j = A, b$ and

$$\theta = \frac{1}{2} + \frac{e_A(k_A+\gamma) - e_B(k_B+\gamma)}{2}. \tag{41}$$

According with equation (41), the level of political support that each party obtains, only depends on the relation of the utility component directly determined by

effort and the relative efficiency to perform better in office. Condition (40) implies that in this type of equilibrium it is always the case that $\frac{k_A+\gamma}{h'\left(e_A^*\right)}=\frac{k_B+\gamma}{h'\left(e_B^*\right)}$ (42). Then, the next result follows.

Result 3

If $k_A \geq (\leq) k_B$, then $e_A^* \geq (\leq) e_B^*$ and $\theta^e \geq (\leq) \frac{1}{2}$, respectively.

Proof. It follows directly from (42), (41) and assumptions (30). □

According with this result, the most efficient party will supply a greater amount of effort. The advantage in this case may come out from either, the cost side or the management capability.

The first part of the result refers to the symmetric case; if both parties have exactly the same characteristics then they will have a symmetric behavior and they will obtain the same amount of supporters.

When some party has lower effort costs, it will expend more effort than its opponent. More citizens will consider this party a better choice independently of their ideological preferences. Similarly when some party has better management skills, it will obtain a greater constituency. Then, as condition (42) implies, what determines the advantage of a competitor over the other is the management efficiency-cost relation.

However, note that there is a difference of competing by reducing effort costs and by increasing management capability. According with condition (42), the strategy of reducing effort costs would be preferred than the one based on increasing the management ability when party's commitment with the people is an important issue for the citizenry. When the marginal cost of effort is reduced given any amount of effort, then the marginal benefit-cost relation of both, the program outcome and the party commitment, increases. In contrast, when management efficiency is greater, only the marginal benefit-cost relation of the program outcome increases.

When the relevance of party's commitment relative to ideological and managerial issues is greater, both parties will compete by providing more effort. This is shown in the next result.

Result 4

i) $\frac{\partial e_j^*}{\partial \gamma} > 0$, for $j = A, B$.

ii) If $k_A \geq (\leq) k_B$ and $h'''(e) \leq 0$, then $\frac{\partial e_A^*}{\partial \gamma} \geq (\leq) \frac{\partial e_B^*}{\partial \gamma}$, respectively; if $h'''(e) \geq 0$, then $\frac{\partial e_A^*}{\partial \gamma} \leq (\geq) \frac{\partial e_B^*}{\partial \gamma}$.

Proof. From condition (40) it follows that $\left.\frac{\partial e_j}{\partial \gamma}\right|_{e_j^*} = \frac{1}{2h''(e_j^*)}$. Then, from assumptions (30) it follows that $\frac{\partial e_j^*}{\partial \gamma} > 0$, for $j = A, B$. The second part of the result follows straightforward from the first part and from Result 3. □

The first part of the result states that in an equilibrium of this type, the amount of effort is positively related with the relevance that commitment has for the citizens. Then according with this result, the greater is the relevance of the party's commitment, the greater the government performance would be. Therefore, social welfare increases both, because citizens care about the level of parties' commitment with the people welfare and because the expected outcomes of the programs are better.

The second part of the result shows that in the symmetric case, both parties react exactly in the same way when the relevance of party's commitment with the people changes for every citizen. In contrast, when some party is more efficient that the other, parties react differently to changes on the relevance of parties' commitment. In any case the there is a positive relationship between the relevance and the amount of effort of any party. However, the proportion in which the amount of effort changes, depends on the curvature of the cost function. This implies that when the cost of effort increases too fast,

the most efficient party will increase its effort in a lower proportion than its rival when commitment increases its relevance within the citizenry. In that case, the amounts of effort of both parties tend to converge when commitment becomes more relevant. In contrast, when the cost of effort does not increase so fast, the most efficient party will increase its amount of effort in a greater proportion than the less efficient party. Thus, the difference of effort levels increases when citizens care more about parties' commitment.

4.3 Equilibrium with Positive Effort Level and Deviation from the Status Quo

In this type of equilibrium the structural characteristics are such that both parties have incentives to provide positive amounts of effort to increase their government performance and to compete programmatically. In that case the following conditions hold and characterize the equilibrium:

$$\frac{1}{2}+\frac{e_A^*\left(k_A+\gamma\right)-e_B^*\left(k_B+\gamma\right)}{2\left(\mu_B^*-\mu_A^*\right)^2}=c'\left(\mu_A{}^*\right), \tag{43}$$

$$\frac{1}{2}-\frac{e_A^*\left(k_A+\gamma\right)-e_B^*\left(k_B+\gamma\right)}{2\left(\mu_B^*-\mu_A^*\right)^2}=C'\left(1-\mu_B{}^*\right), \tag{44}$$

$$\frac{k_A+\gamma}{2\left(\mu_B^*-\mu_A^*\right)}=h'\left(e_A^*\right), \tag{45}$$

$$\frac{k_B+\gamma}{2\left(\mu_B^*-\mu_A^*\right)}=h'\left(e_B^*\right), \tag{46}$$

Note that these conditions imply that the relative marginal revenue of competing programmatically with respect to the marginal costs of promoting a political program must be the same for both parties:

$$\frac{\left(\mu_B^* - \mu_A^*\right)^2 + e_A^*\left(k_A + \gamma\right) - e_B^*\left(k_B + \gamma\right)}{c'\left(\mu_A{}^*\right)} = \frac{\left(\mu_B^* - \mu_A^*\right)^2 - e_A^*\left(k_A + \gamma\right) + e_B^*\left(k_B + \gamma\right)}{C'\left(1 - \mu_B{}^*\right)}.$$

Similarly, the relative marginal revenue of effort with respect to its marginal cost is also the same for both parties (see equation16).

From these conditions the next result follows.

Result 5

i) If, $k_A = k_B$, then $e_A^* = e_B^*$.

ii) If, $k_A = k_B$ and $c(x) \geq (\leq) C(x) \quad \forall x \in [0,1]$, then $\mu_A^* \leq (\geq) 1 - \mu_B^*$ and $\theta \leq (\geq) \frac{1}{2}$, respectively.

iii) If $c(\cdot) \equiv C(\cdot)$ and $k_A \geq (\leq) k_B$, then $\mu_A^* \geq (\leq) 1 - \mu_B^*$, $e_A^* \geq (\leq) e_B^*$ and $\theta \geq (\leq) \frac{1}{2}$, respectively.

Proof. First order conditions (45) and (46) imply (42), then, the first part of the result follows straightforward. If $k_A = k_B$, then (43) and (44) become $\frac{1}{2} = c'\left(\mu_A{}^*\right)$ and $\frac{1}{2} = C'\left(1 - \mu_B{}^*\right)$. Then, from assumptions (28) and (29) the second part of the result follows. From condition (42), if $k_A \geq (\leq) k_B$ then $e_A^* \geq (\leq) e_B^*$ respectively. Therefore, (43) and (44) imply $c'\left(\mu_A{}^*\right) \geq (\leq) C'\left(1 - \mu_B{}^*\right)$ respectively, and then from assumptions (28) and (29), the last part of the result follows. □

Result 5 states the usual outcome of the symmetric case. When the parties are identical except for their *status quo*, the pivotal constituent is located in the middle of the ideological space and the amounts of effort and the program deviations are the same for both parties. It is also the case that if both parties are equally efficient the amounts of effort are always the same, and their programmatic strategies just depend on the costs of deviating from their ideal program.

In the case that either party *A* or *B* has some advantage within the ideological space because of a lower cost of deviating from its *status quo*, it will be able to attract more supporters by moving its political program towards its opponent's position. This reduces the marginal benefit within the ideological dimension for its opponent, and therefore this last will be less aggressive and deviate less from its *status quo*.

5 Private Information Equilibria

The previous results are important benchmarks; however, effort is usually private information. In this section, I analyze the case where citizens can not observe parties' effort. Still, citizens care about effort as a signal of parties' commitment with the citizenry. Then citizens consider the outcomes of the programs as signals to infer the amount of effort that each party expended. Citizens' perceptions and beliefs about the political parties and the political system have an important roll when effort is inferred. Then, in choosing the ideological position of their programs and the optimal amount of effort to advance them, political parties consider both the expected effects of random events over their program results and the structure of beliefs that determine the confidence in each party and in the political system.

The equilibrium in this case is strongly determined by the confidence that the citizens have in each political party and in the political system.

To advance in the analysis it is important to define the main concepts I use in this last part.

Definition 1 Citizens have more confidence in party *j* than in party $-j$, if the posterior distribution for *j*, $f_j\left(e_j \middle| y_j, \varepsilon, t_j\right)$, strictly first order stochastically dominates the posterior distribution of its rival, $f_{-j}\left(e_{-j} \middle| y_{-j}, \varepsilon, t_{-j}\right)$, for every $y_j = y_{-j}$.

This implies that if the citizenry considers party *j* more trustable than party $-j$, then for every $y_j = y_{-j}$, $\int_{-\infty}^{\infty} x f_j\left(\left| y_j, \varepsilon, t_j\right.\right) dx > \int_{-\infty}^{\infty} x f_{-j}\left(x \middle| y_{-j}, \varepsilon, t_{-j}\right) dx$ (47).

Equation (47) means that if both governments have the same performance result, constituents will assign a greater expected effort level to the party they trust more independently of the performance level.

In the case of our beta posterior distribution if citizens consider party *j* more trustable than party $-j$, then $t_j > t_{-j}$.

For the purpose of this paper we need some idea of low and high confidence in a political party. Citizens, can share a high or a low trust level for a particular party regardless their trust in the opponent. In fact, a high or low trust in a particular party depends on the effort that constituents would expect considering the realized outcome from the political program relative to the realized, but non-observed, effort level. The model relates greater confidence in a party, with higher expected effort values given the observed program result and the realization of the random shock. However, it would be too much cynicism defining "high confidence" as the overestimation of the amount of effort, and "low" confidence as an underestimation of the effort level. An excessively low trust level in any party, however, may imply that given the observed output and shock, citizens infer a lower effort level that the real amount of effort provided by the party. Similarly, an excessively high trust level may imply that the expected effort is greater than the actual non observed amount of effort expended by the party. In any case low or high confidence in any party is determined by the characteristics of the posterior distributions.

To avoid any discussion about the idea of high and low confidence, I will use the concepts of *excessively high* and *excessively low* trust or confidence in a party defined as follows.

Definition 2 Citizens have excessively high confidence in party *j*, if in a private information equilibrium, the expected amount of effort provided by party *j*, given the performance outcome and the shock realization, is greater than the actual amount of effort provided by the party, e_j^*. In contrast, citizens have excessively low confidence in party *j*, if in a private information equilibrium, the inferred amount of effort provided by party *j* is lower than the amount of effort provided by the party, e_j^*.

Assuming our posterior distributions, excessively high confidence in party *j* implies the next condition: $t_j > e_j^* \left(1 + \frac{\overline{\varepsilon}}{a - \hat{\varepsilon} + \overline{\varepsilon} + k_j e_j^*} \right)$. In contrast, excessively low confidence in party *j* implies $t_j < e_j^* \left(1 + \frac{\underline{\varepsilon}}{a - \hat{\varepsilon} + \underline{\varepsilon} + k_j e_j^*} \right)$.

Citizens can also share different levels of trust in the political system as a whole, independently of the relative confidence in each political party. This would imply that institutional and structural settings are such that the citizens perceive that political parties face stronger incentives to commit them selves with their constituencies' welfare. Then, there is a generalized perception within the citizenry that the political system has stronger and more efficient mechanisms to provide political accountability. In that case citizens expect that political parties face stronger incentives to perform better in any circumstance.

Definition 3 Citizens have more confidence in political system *i* than in political system i', if the expected amount of effort for each party is greater in system *i* than the inferred effort level in system i', independently of the relative confidence in the different parties.

In our case, a higher confidence in system *i* than in system i', implies $t_j^i > t_j^{i'}$ for $j = A, B$, and $\frac{t_A^i}{t_B^i} = \frac{t_A^{i'}}{t_B^{i'}}$. Then an increase of the confidence in the political system is equivalent to an increase on the parameter γ of the objective function for the parties. Note that this is conceptually different to an increase of the relevance of parties' commitment with the people. However, since citizens believe that the system has stronger accountability mechanisms, they think that parties always provide greater amounts of effort. Therefore the marginal political revenue of effort increases with the confidence in the system, which is equivalent to the incentive provided by an increase on the relevance of parties' commitment with the citizenry.

These three definitions determine the way in which the changes of confidence in the parties and in the political system are incorporated into the model.

5.1 The Equilibrium with Positive Effort and Deviation from the Status Quo

In this case, with a posterior beta distributions, an equilibrium where both parties have incentives to provide a positive level of effort and to compete programmatically is characterized by the next conditions:

,

$$\frac{1}{2}+\frac{k_A e_A^* - k_B e_B^*}{2\left(\mu_A^* - \mu_A^*\right)^2}+\frac{\gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A\left(a+k_A e_A^*+\varepsilon-\hat{\varepsilon}\right)}{a+k_A e_A^*+2\varepsilon-\hat{\varepsilon}}-\frac{t_B\left(a+k_B e_B^*+\varepsilon-\hat{\varepsilon}\right)}{a+k_B e_B^*+2\varepsilon-\hat{\varepsilon}}\right)d\varepsilon}{2\left(\mu_B^* - \mu_A^*\right)^2}=c'\left(\mu_A^*\right) \quad (48)$$

$$\frac{1}{2}-\frac{k_A e_A^* - k_B e_B^*}{2\left(\mu_A^* - \mu_A^*\right)^2}-\frac{\gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A\left(a+k_A e_A^*+\varepsilon-\hat{\varepsilon}\right)}{a+k_A e_A^*+2\varepsilon-\hat{\varepsilon}}-\frac{t_B\left(a+k_B e_B^*+\varepsilon-\hat{\varepsilon}\right)}{a+k_B e_B^*+2\varepsilon-\hat{\varepsilon}}\right)d\varepsilon}{2\left(\mu_B^* - \mu_A^*\right)^2}=C'\left(1-\mu_B^*\right) \quad (49)$$

$$\frac{k_A}{2\left(\mu_B^* - \mu_A^*\right)}+\frac{\gamma\phi t_A k_A\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\varepsilon\left(a+k_A e_A^*+2\varepsilon-\hat{\varepsilon}\right)^{-2}d\varepsilon}{2\left(\mu_B^* - \mu_A^*\right)}=h'\left(e_A^*\right), \quad (50)$$

$$\frac{k_B}{2\left(\mu_B^* - \mu_A^*\right)}+\frac{\gamma\phi t_B k_B\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\varepsilon\left(a+k_B e_B^*+2\varepsilon-\hat{\varepsilon}\right)^{-2}d\varepsilon}{2\left(\mu_B^* - \mu_A^*\right)}=h'\left(e_B^*\right), \quad (51)$$

According with first order conditions (50) and (51) it follows that the marginal cost-revenue for both parties are equal in this kind of equilibria. Then the next condition holds:

$$\frac{k_A+\gamma\phi t_A k_A\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\varepsilon\left(a+k_A e_A^*+2\varepsilon-\hat{\varepsilon}\right)^{-2}d\varepsilon}{h'\left(e_A^*\right)}=\frac{k_B+\gamma\phi t_B k_B\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\varepsilon\left(a+k_B e_B^*+2\varepsilon-\hat{\varepsilon}\right)^{-2}d\varepsilon}{h'\left(e_B^*\right)} \quad (52),$$ and the next result follows.

Result 6

i) If $k_A=k_B$, $c(\cdot)\equiv C(\cdot)$, $t_A=t_B$, then $e_A^*=e_B^*$, $\mu_A^*=1-\mu_B^*$ and $\theta^e=\frac{1}{2}$.

ii) If citizens' trust in party j is greater than trust in party $-j$, $t_j>t_{-j}$, and $k_A=k_B$, then $e_j^*>e_{-j}^*$.

iii) If $t_A>(<)t_B$, $k_A=k_B$ and $c(\cdot)\equiv C(\cdot)$, then $e_A^*>(<)e_B^*$, $\theta^e-\mu_A^*>(<)\mu_B^*-\theta^e$, $\mu_A^*>(<)1-\mu_B^*$ and $\theta^e>(<)\frac{1}{2}$, respectively.

Proof. See Appendix B5.

The first part of the result refers to the symmetric case. The result is similar to the one in the case of perfect information: if both competitors have the same structural conditions (costs and performance functions) and if they share the same public trust structure, then they behave exactly in the same way. Both deviate in the same proportion from their ideological *status quo* and they provide the same effort level. Even though effort is not publicly observed, constituents observe the program outcomes and use them to infer the effort levels to set their preferences about the political parties. This provides the incentive for parties to supply positive effort levels when the expected marginal revenue of supplying effort is greater than the marginal costs.

It is clear that when parties have different structural characteristics but the same public trust, the characteristics of the equilibrium are similar to the perfect information case (see Result 5). Then in this part of the paper I focus on the effects of the trust structure over parties' behavior.

According with the last part of Result 6, when trust is different for each party, even if their structural characteristics are the same, the party with a greater trust has a competitive advantage within the effort dimension. This party uses its advantage by providing a greater level of effort. Then, the expected value of its performance increases and the party increases its political benefit of competing programmatically. Thus the party deviates in a greater proportion from its *status quo*, behaving closer to what the median voter theorem would suggest. In contrast, the less trusted party provides a lower level of effort and competes less aggressively over the programmatic dimension. A party with the greater citizenry's trust, then, increases its benefit on the programmatic dimension when it increases its amount of effort. Thus, this party contends more aggressively over the programmatic dimension even when this is costly. This has an important implication since the result argues that relative trust levels have an important role on the performance of competing rulers.

An important question is the relation between the citizens' confidence in the political system and the performance of the political parties as office holders. For this essay, greater confidence in the political system implies that citizens believe the system has better mechanism of political accountability. Then, citizens share higher expectations about the amount of effort that every party expend to advance their programs, given their programmatic results and nature's random behavior. The greater is the trust in the political system, the greater the expected effort levels for all parties are.

Thus, according with our definitions, a change of the citizenry confidence in the political system implies a proportional change in the expected values for every party's effort, maintaining constant the relative trust structure. As it has been explained before, this change is equivalent to a change on parameter γ. The next result builds some insights on the effects that citizens' trust in the political system has over government performance.

Result 7

i) If $k_A = k_B$, $c(\cdot) \equiv C(\cdot)$ and $t_A = t_B$, then $\frac{d\mu_A^*}{d\gamma} = \frac{d\mu_B^*}{d\gamma} = 0$, $\frac{de_A^*}{d\gamma} = \frac{de_B^*}{d\gamma} > 0$ and $\frac{\partial \theta^e}{\partial \gamma} = 0$.

ii) If $c(\cdot) \equiv C(\cdot)$ and $k_j > k_{-j}$, then $\frac{de_j^*}{d\gamma} < 0$ if the following condition holds: $\frac{2\Delta}{\mu_B^* - \mu_A^*}\left(\hat{\mathrm{E}}_{-j}^{-1} h'\left(e_{-j}^*\right)^2 - \hat{\mathrm{E}}_j^{-1} h'\left(e_j^*\right)^2\right)\mathrm{X}^{-1} > 1$ (53), according with the definitions for $\hat{\mathrm{E}}_j$, Δ and X in Appendix B6.

Proof. See Appendix B6.

The first part of this result shows that if the political system is more trustable and if the political parties are similar (the symmetric case), then the effort level and the expected government performance are greater for both competitors. An increase of trust implies an increase in the marginal benefit of effort given the structural characteristics. Therefore, both parties tend to increase competition over the performance dimension by increasing their effort levels and since in this case there is no structural competitive advantage, both maintain their positions over the ideological dimension. Thus, parties do not increase competition by lowering their programmatic differences but by increasing the expected program performances. Then, the expected government performance and citizenry welfare is greater when the system is more trustable. On the contrary, as Tenzer (1992), Beck (1992 and 1994) and Giddens (1998) argue, a generalized perception of misrepresentation of the political institutions may leads to a state where accountability becomes useless as a mechanism to improve institutional performance and parties perform poorly.

However, when the trust structure is not symmetric, the story is not necessarily the same.

Note that condition (53) holds when the amount of effort for party *j* is greater enough than the amount of effort of party *–j*. This is the case when there is an important difference of trust in each party. Then, the party with higher trust provides more effort

than its rival. A proportional increase of the trust allows the party with the greater trust level to maximize its expected benefit by reducing both, the effort level and the deviation of its *status quo*, without losing its advantage over the opponent. The rival's response is the reduction of effort since the competitive advantage increases over the performance dimension, and then it competes by deviating more over the ideological space. Then, in this case, both parties may reduce the amount of effort to advance their programs. Therefore the expected government performance and the social welfare decrease.

In contrast, when effort levels are similar, given the structural characteristics, the difference in the public trust for the rulers is low enough to maintain a not so high competitive advantage. When these conditions hold, an increase of trust in political institutions provides an incentive to compete over the performance dimension, leading to a higher level of effort and consequently to greater expected levels of government performance.

It is possible that in societies with greater trust in political institutions, trust levels for the different political competitors tend to be relatively close. Thus, according with this result, societies with high trust in political institutions will have better government performances than societies with a low generalized trust in political institutions. Moreover, in a society with low levels of trust in the political system, an increase of the trust level won't necessarily drive to a higher government performance.

Result 7 also argues that when there is some difference in the level of trust for each ruler, and since marginal costs are increasing, then a positive change of trust in the political system causes an increase in the distance between μ_A^* and μ_B^*. This implies that the political parties tend to differentiate them selves in a greater degree over the ideological dimension with respect to their opponents. Then, the greater is the difference of trust level for each party, the less they tend to converge over the ideological dimension.

Finally, Result 8 compares the cases of private information and perfect information.

Result 8 If citizens confidence in the political system is extremely high, then if $k_A = k_B$, $c(\cdot) \equiv C(\cdot)$ and $t_A = t_B$, the expected government performance for both parties and their realized effort are greater in the case of private information than they would be in the case of perfect information. In contrast, an extremely low level of confidence in the political system drives to a low expected government performance and low amounts of effort compared with those than they would be obtained in the case of perfect information.

Proof. See appendix B7.

Since in this case an extremely high trust in the political system do not drive to some programmatic competitive advantage for any of both parties, they will maintain the same position in the ideological space that they have in the case of perfect information. However, when public trust in political system is excessive, constituents tend to overestimate parties' effort given some observed performance output and random events. Thus, in the case that both competitors share exactly the same characteristics, an extremely high trust level provide them with the incentive to increase the amount of effort since the marginal benefit increases for every effort level. Therefore, a higher trust in political system leads to the expenditure of greater amounts effort and thus, a better government performance would be expected. On the contrary, if trust is low, parties provide less amount effort and then, the expected performance is also lower than the one obtained when effort can be observed.

6 Concluding Remarks

There is no clear explanation about the relationship between government performance and trust in both, parties and the political system. However, there is a generalized argument that trust affects performance and different theoretical approaches observe a negative effect of the lack of trust in the political system and government and institutional performance. Surprisingly, in contrast with the expectations of some rational

choice theories, competitive political markets do not necessarily lead to better outcomes in terms of institutional performance. In this paper I build on an explanation based on a formal model of retrospective political competition to solve this contradiction.

The model shows that when parties compete programmatically and when citizens care about program outcomes and parties' commitment with their constituencies, the level of trust in the political system matters. Consistently with the arguments of some scholars like Tenzer (1992), Beck (1992 and 1994) and Giddens (1998), the model shows that a generalized perception of misrepresentation of the political institutions may lead to a state where accountability becomes useless as a mechanism to improve institutional performance.

However, the relation between trust in the system and government performance, depends on the structure of believes. It is not necessarily the case that an increase on the confidence in the political system produces better outcomes in terms of institutional performance. The effects of the level of trust in the political system depend on the initial structure of relative trust in the different parties. In particular, the model shows that when some party has an important advantage in terms of trust over its opponent, an increase of the confidence in the political system may lead to lower government performance.

The internal structure of the parties is also an important element in terms of institutional performance. If parties are less prone to shift apart their *status quo*, it is expected that competition will lead to improve their performances in office. It is also the case that when a party looses trust within the citizenry, will compete with greater shifts of its program and tend to react more as an opportunistic party.

The model is consistent with rational choice theories of reputation building. However, I argue that good reputation is important in relative terms. Parties will always try to gain a greater reputation than their rivals but this does not necessarily mean they will prefer a greater trust as a result of a more trustable political system.

The model shows how it is possible that if the credibility on the system is extremely low, the parties will provide less effort without loosing their constituencies since the relative competitiveness of the parties is not affected. Therefore, since effort is

costly, parties may increase their political profit in a situation where the political system is less trustable and there is no incentive to improve the trust in the political system.

Nonetheless, if trust in the system is extremely high, the political parties tend to deviate less from their ideal programs. Therefore the realized programs can signal better the true ideological position of the parties, reinforcing reputation and improving the evaluation of political campaigns.

Surprisingly, in this context perfect information is not necessarily better from the citizens' point of view, since social welfare can be higher when effort is not observable and trust in the political system is high enough. But this also conflicts with parties' interests. Political parties in that situation would be better off if effort could be observable. In this situation transparency is an important issue for political parties. Nonetheless, when trust in the system is low enough, political parties can benefit from imperfect information and thus they do not have an incentive to promote transparency of public officers' behavior.

Appendix

Appendix A: Proofs for Chapter 1

A1 The Kuhn Tucker conditions of (0.8) and (0.9) are

$$\pi T\left[\alpha^j f^j\left(\frac{u\left(y^j+t^j\right)-u\left(y^j\right)}{2(b-a)}+\theta\right)\frac{u'\left(y^j+t^j\right)}{2(b-a)}-\frac{TK\alpha^j\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^h\right)-u\left(y^h\right)}{2(b-a)}+\theta\right)}{2(b-a)}\right]$$

$$+\lambda^j-\mu_1\alpha^j=0$$

$$\lambda^j\geq 0,\lambda^j t^j=0,\ t^j\geq 0,\ \mu_1\geq 0,\ \ G-T\sum_{j=1}^{J}\alpha^j t^j\geq 0,\ \mu_1\left(G-T\sum_{j=1}^{J}\alpha^j t^j\right)=0,$$

$$\pi T\sum_{j=1}^{J}\alpha^j f^j\left(\frac{u\left(y^j+t^j\right)-u\left(y^j\right)}{2(b-a)}+\theta\right)\left(\frac{1}{2}+\frac{u\left(y^j+t^j\right)-u\left(y^j\right)+kg}{2(b-a)^2}\right)+\mu_2-\mu_3-C_A'(a)=0$$

$$\mu_2 a=0,\ \mu_2\geq 0,\ a\geq 0,\ \mu_3(L-a)=0,\ \mu_3\geq 0,\ L-a\geq 0,$$

$$\pi T\sum_{j=1}^{J}\alpha^j f^j\left(\frac{u\left(y^j+t^j\right)-u\left(y^j\right)}{2(b-a)}+\theta\right)\left(\frac{1}{2}-\frac{u\left(y^j+t^j\right)-u\left(y^j\right)+Kg}{2(b-a)^2}\right)-\mu_4+\mu_5-C_B'(L-b)=0$$

$$\mu_4 b=0,\ \mu_4\geq 0,\ b\geq 0,\ \mu_5(L-b)=0,\ \mu_5\geq 0,\ L-b\geq 0,$$

where λ^j, $j=1,...,J$ and μ_i, $i=1,...,5$, are the Lagrange multipliers for the maximization problems.

A2 If there doesn't exist a set $\left\{t^j\right\}_{j=1}^{J}$, given *G* and for any combination $a,b\in[0,L]$, such that

$$f^j\left(\frac{u\left(y^j+t^j\right)-u\left(y^j\right)+K\left(G-T\sum_{j=1}^{J}\alpha^j t^j\right)+b^2-a^2}{2(b-a)}\right)u'\left(y^j+t^j\right)\geq$$

$$K\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^h\right)-u\left(y^h\right)+K\left(G-T\sum_{j=1}^{J}\alpha^j t^j\right)+b^2-a^2}{2(b-a)}\right),(0.54)$$

for some $j\in\{1,2,...,J\}$, then $t^j=0\ \ \forall j=1,...,J$, and thus clientele-patronage relations are not build, $P=0$, and the incumbent uses all the public resources to supply public goods, $g=G$.

A3 Proof of Result 1

From the Kuhn Tucker conditions, if $t^j>0$ for some *j*, then **Error! Reference source not found.** must hold and can be rewritten as:

$$f^j\left(\frac{u\left(y^j+t^j\right)-u\left(y^j\right)}{2(b-a)}+\theta\right)\left(u'\left(y^j+t^j\right)-KT\alpha^j\right)\geq$$

$$TK\sum_{h}^{-j}\alpha^h f^h\left(\frac{u\left(y^h+t^h\right)-u\left(y^h\right)}{2(b-a)}+\theta\right)\qquad(0.55)$$

Since the right side of condition **Error! Reference source not found.** is always non negative and from assumptions (0.4), if $u'\left(y^j\right)<KT\alpha^j$, then $u'\left(y^j+t^j\right)<KT\alpha^j$ for any

$t^j \geq 0$, therefore group *j* would never be targeted to setup a clientele-patron relation. This implies that if $t^j > 0$ then $u'\left(y^j\right) - KT\alpha^j > 0$ must hold. Let $\underline{y}^j = u'^{-1}\left(KT\alpha^j\right)$.

Note that the left side of **Error! Reference source not found.** is not necessarily decreasing on t^j and then its maximum is given by $f^j\left(m_j\right)\left(u'\left(y^j\right) - KT\alpha^j\right)$. Let $x_m = \arg\min_x \sum_{h=1}^{J} \alpha^h f^h\left(x\right)$, since we assume the space is continuous, then the density is positive in every point, thus $\sum_{h=1}^{J} \alpha^h f^h\left(x_m\right) > 0$. Then, $u'\left(y^j\right) \leq \dfrac{TK\sum_{h=1}^{J} \alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)}$ implies $u'\left(y^j\right) \leq \min_{\chi}\left\{\dfrac{TK\sum_{h=1}^{J} \alpha^h f^h\left(\chi\right)}{f^j\left(\chi\right)}\right\}$ and therefore

no agent in group *j* is ever considered a possible client. □

A4 Proof of Corollary 1.

i) Condition (0.11) can be rewritten as $y^j \geq u'^{-1}\left(TK\alpha^j + \dfrac{TK\sum_{h}^{-j} \alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)}\right)$, then it follows $u'\left(y^j\right) - KT\alpha^j \leq \dfrac{TK\sum_{h}^{-j} \alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)}$ and since $\dfrac{TK\sum_{h}^{-j} \alpha^h f^h\left(x_m\right)}{f^j\left(m^j\right)} \geq 0$, if $u'\left(y^j\right) - KT\alpha^j \leq 0$, condition (0.11) holds and therefore *j* is never targeted as a clientelistic group.

The rest of the corollary follows directly from Result 1. □

A5 Proof of Lemma 1.

Suppose $\left\{a^*, b^*, g^*, \left\{t^{j*}\right\}_1^J\right\}$ is an equilibrium where:

$$\left(\frac{u'\left(y^j+t^{j*}\right)-KT\alpha^j}{2\left(b^*-a^*\right)}\right)\left(u'\left(y^j+t^{j*}\right)-KT\alpha^j\right)f^{j\prime}\left(\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)+$$

$$u''\left(y^j+t^{j*}\right)f^j\left(\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)\geq 0\,.\ (0.56)$$

If **Error! Reference source not found.** holds with inequality, then there exist some *x*, $t^{j*}>x\geq 0$, such that for any $t\in\left(x,t^{j*}\right)$,

$$f^j\left(\frac{u\left(y^j+t\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)u'\left(y^j+t\right)<$$

$$TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right),$$

and therefore total political revenue is greater with *t* than with t^{j*}, therefore it can not be an equilibrium. If equation **Error! Reference source not found.** holds with strict equality, then $f^j\left(\frac{u\left(y^j+t\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)\left(u'\left(y^j+t\right)-KT\alpha^j\right)$ is either a maximum or a minimum. If it is a maximum then the previous part of the proof applies. If it is a minimum then there exist some $x>t^{j*}$ such that for any $t\in\left(t^{j*},x\right)$

$$f^j\left(\frac{u\left(y^j+t\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right)u'\left(y^j+t\right)>$$

$$TK\sum_{h=1}^{J}\alpha^h f^h\left(\frac{u\left(y^h+t^{h*}\right)-u\left(y^j\right)+Kg^*+b^{*2}-a^{*2}}{2\left(b^*-a^*\right)}\right),$$ and therefore total political revenue is greater with *t* than with t^{j*}, therefore it can not be an equilibrium. □

A6 Proof of Result 2.

Derivating (0.15) respect to $f^j(\cdot)$ we have

$$\frac{\partial t^{j*}}{\partial f^{j}(\cdot)} = -\frac{1}{u''\left(y^{j}+t^{j*}\right)}\left(\frac{K\sum_{h}^{-j} T\alpha^{h} f^{h}\left(\frac{u\left(y^{h}+t^{h*}\right)-u\left(y^{j}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)}{f^{j}\left(\frac{u\left(y^{j}+t^{j*}\right)-u\left(y^{j}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)^{2}}\right) > 0 . \quad \square$$

A7 Income Effect over Patronage Transfers

Differentiating equation (0.15) we get $\frac{dt^{j*}}{dy^{j}} = -\frac{\Phi_{y^{j}} + \Phi^{2}u''\left(u'^{-1}\left(\frac{1}{\Phi}\right)\right)}{\Phi_{t^{j}} + \Phi^{2}u''\left(u'^{-1}\left(\frac{1}{\Phi}\right)\right)}$, where $\Phi_{x} \equiv \frac{\partial \Phi}{\partial x}$. If $-\Phi^{2}u''\left(y^{j}+t^{j*}\right) \in \left(\min\left\{\Phi_{y^{j}}, \Phi_{t^{j}}\right\}, \max\left\{\Phi_{y^{j}}, \Phi_{t^{j}}\right\}\right)$, then income has positive effect over the individual transfer. This is possible just if at least one of $\Phi_{y^{j}}$ and $\Phi_{t^{j}}$ is positive and high enough, where as the other effect over the relative density is low enough. In all other cases income and individual transfers have a negative relationship.

A8 Proof of Result 3

According with Assumption 1 and differentiating (0.15) the following is obtained,

$$\frac{\partial t^{j*}}{\partial y^{j}} = -\frac{\left(\frac{\left(u'\left(y^{j}+t^{j*}\right)-KT\alpha^{j}\right)^{2}}{2\left(b^{*}-a^{*}\right)}\right) f'^{j}(\Theta) + u''\left(y^{j}+t^{j*}\right) f^{j}(\Theta)}{\left(\frac{\left(u'\left(y^{j}+t^{j*}\right)-u'\left(y^{j}\right)\right)}{2\left(b^{*}-a^{*}\right)}\right)\left(u'\left(y^{j}+t^{j*}\right)-KT\alpha^{j}\right) f'^{j}(\Theta) + u''\left(y^{j}+t^{j*}\right) f^{j}(\Theta)},$$

with $\chi = \frac{u\left(y^{j}+t^{j*}\right)-u\left(y^{j}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}$. From (0.4) and Lemma 1 the result follows straightforward. $\square$

A9 Proof of Result 4.

According with Assumption 1 and Differentiating (0.15) and according with Assumption 1, we obtain

$$\frac{\partial t^{j*}}{\partial K}=\frac{\left(\frac{g^*}{2\left(b^*-a^*\right)}\right)\left(u'\left(y^j+t^{j*}\right)-KT\alpha^j\right)\frac{f'^j(\Theta)}{f^j(\Theta)}+\frac{u'\left(y^j+t^{j*}\right)}{K}}{\left(\frac{\left(u'\left(y^j+t^{j*}\right)-KT\alpha^j\right)^2}{2\left(b^*-a^*\right)}\right)\frac{f'^j(\Theta)}{f^j(\Theta)}+u''\left(y^j+t^{j*}\right)}.$$ From Lemma 1, the result follows straightforward. □

A10 Proof of Result 5.

Let $\omega\equiv\frac{b^*+a^*}{2}$, then under Assumption 1, from (0.15),

$$\frac{dt^{j*}}{d\omega^*}=-\frac{\left(u'\left(y^j+t^{j*}\right)-KT\alpha^j\right)f'(\Theta)}{f'(\Theta)\frac{u'\left(y^j+t^{j*}\right)-KT\alpha^j}{2\left(b^*-a^*\right)}+f(\Theta)u''\left(y^j+t^{j*}\right)}.$$

According to Lemma 1, the denominator is always negative for any clientelistic group, therefore if $f'(\Theta)>(<)0$, then $\frac{dt^{j*}}{d\omega^*}>(<)0$.

In the same way, $$\frac{dt^{j*}}{d\left(b^*-a^*\right)}=\frac{\left(\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*}{\left(b^*-a^*\right)^2}\right)f'(\chi)}{f'(\chi)\frac{\left(u'\left(y^j+t^{j*}\right)-KT\alpha^j\right)^2}{2\left(b^*-a^*\right)}+f(\chi)u''\left(y^j+t^{j*}\right)},$$

therefore if $f'(\chi)>(<)0$, then $\frac{dt^{j*}}{d\left(b^*-a^*\right)}<(>)0$. □

A11 Proof of Result 8.

From assumption 2 and (0.20), the critical level for the whole economy is $\tilde{y}+u'^{-1}\left(TK\sum_{h=1}^{J}\alpha^h f^h\left(x_m\right)\left(\max\left\{f^j\left(m^j\right)\right\}_{j=1}^{J}\right)^{-1}\right)$.

Since

$$u'^{-1}\left(\frac{K\sum_{h=1}^{J}T\alpha^{h}f^{h}\left(\frac{u\left(\frac{\beta_h}{\alpha_h}\overline{y}+t^{h*}\right)-u\left(\frac{\beta_h}{\alpha_h}\overline{y}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)}{f^{j}\left(\frac{u\left(\frac{\beta_j}{\alpha_j}\overline{y}+t^{j*}\right)-u\left(\frac{\beta_j}{\alpha_j}\overline{y}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)}\right)\leq u'^{-1}\left(\frac{TK\sum_{h=1}^{J}\alpha^{h}f^{h}\left(x_m\right)}{\max\left\{f^{j}\left(m^{j}\right)\right\}_{j=1}^{J}}\right)$$

for any $\left\{a^{*},b^{*},g^{*},\left\{t^{j*}\right\}_{1}^{J}\right\}$, then if $\frac{\beta_j}{\alpha_j}\overline{y}<\tilde{y}$, it is always the case that

$$\frac{\beta_j}{\alpha_j}\overline{y}<\tilde{y}+u'^{-1}\left(\frac{K\sum_{h=1}^{J}T\alpha^{h}f^{h}\left(\frac{u\left(\frac{\beta_h}{\alpha_h}\overline{y}+t^{h*}\right)-u\left(\frac{\beta_h}{\alpha_h}\overline{y}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)}{f^{j}\left(\frac{u\left(\frac{\beta_j}{\alpha_j}\overline{y}+t^{j*}\right)-u\left(\frac{\beta_j}{\alpha_j}\overline{y}\right)+Kg^{*}+b^{*2}-a^{*2}}{2\left(b^{*}-a^{*}\right)}\right)}\right),\text{ and therefore}$$

$$\frac{\beta_j}{\alpha_j}\overline{y}<\tilde{y}+u'^{-1}\left(TK\sum_{h=1}^{J}\alpha^{h}f^{h}\left(x_m\right)\left(\max\left\{f^{j}\left(m^{j}\right)\right\}_{j=1}^{J}\right)^{-1}\right)\text{ for any }\left\{a^{*},b^{*},g^{*},\left\{t^{j*}\right\}_{1}^{J}\right\}.\ \square$$

A12 Proof of Result 11.

Differentiating the equation system (0.22), (0.23) and (0.24), and after some algebra it follows

$$\frac{\partial t^{j}}{\partial\gamma}=\frac{-\left(u'\left(y^{j}-t^{j*}\right)-\alpha^{j}KT\right)\Gamma\frac{C}{\pi T}}{\alpha^{j}\left[\left(u''\left(y^{j}-t^{j*}\right)f^{j}\left(\chi\right)+\frac{\left(u'\left(y^{j}-t^{j*}\right)-\alpha^{j}KT\right)^{2}}{2\left(b^{*}-a^{*}\right)}f^{j\prime}\left(\chi\right)\right)\Gamma+\alpha^{j}\Psi\left(f^{j\prime}\left(\chi\right)\right)^{2}\right]}\quad(0.57)$$

where:

$$\Gamma \equiv \frac{\alpha^j \left(u\left(y^j - t^{j*}\right) - u\left(y^j\right) + kg^*\right) f^j(\chi) + Kg^* \sum_{-j} \alpha^h \phi^h}{\left(b^* - a^*\right)^3},$$

$$\Psi \equiv \left(\frac{1}{2} + \frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + kg^*}{\left(b^* - a^*\right)^2}\right)^2 \left(\frac{1}{2} - \frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right) + kg^*}{\left(b^* - a^*\right)^2}\right)^2,$$

$$\chi \equiv \frac{u\left(y^j + t^{j*}\right) - u\left(y^j\right)}{\left(b^* - a^*\right)} + \theta^*.$$

Thus it follows that if:

$$\left(u''\left(y^j - t^{j*}\right) f^j(\chi) + \frac{\left(u'\left(y^j - t^{j*}\right) - \alpha^j KT\right)^2}{2\left(b^* - a^*\right)} f^{j\prime}(\chi)\right)\Gamma + \alpha^j \Psi \left(f^{j\prime}(\chi)\right)^2 < (>) 0 \text{ (0.58)},$$

then $\frac{\partial t^*}{\partial \gamma} > (<) 0$.

Notice that given the characteristics of the utility function (0.4), the right side of equation **Error! Reference source not found.**, is a strictly convex function on $f^{j\prime}(\chi)$ with two real roots:

$$r_1 = \frac{-\frac{\Gamma\left(u'\left(y^j - t^{j*}\right) - \alpha^j KT\right)^2}{2\left(b^* - a^*\right)} - \sqrt{\frac{\Gamma^2\left(u'\left(y^j - t^{j*}\right) - \alpha^j KT\right)^4}{4\left(b^* - a^*\right)^2} - 4\alpha^j \Psi f^j(\chi) u''\left(y^j - t^{j*}\right)}}{2\alpha^j \Psi} < 0$$

and

$$r_2 = \frac{-\frac{\Gamma\left(u'\left(y^j - t^{j*}\right) - \alpha^j KT\right)^2}{2\left(b^* - a^*\right)} + \sqrt{\frac{\Gamma^2\left(u'\left(y^j - t^{j*}\right) - \alpha^j KT\right)^4}{4\left(b^* - a^*\right)^2} - 4\alpha^j \Psi f^j(\chi) u''\left(y^j - t^{j*}\right)}}{2\alpha^j \Psi} > 0$$

with $r_2 < -r_1$ and with a minimum at $-\frac{\Gamma\left(u'\left(y^j - t^{j*}\right) - \alpha^j TK\right)^2}{4\left(b^* - a^*\right)\alpha^j \Psi}$.

Therefore, if $f^{j\prime}(\chi)\in(r_1,r_2)$, then $\frac{\partial t^*}{\partial\gamma}>0$. Nevertheless Lemma 2 states that in any equilibrium $f^{j\prime}(\chi)<-\frac{\Gamma}{\alpha^j}\left(\frac{1}{2}-\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*}{2\left(b^*-a^*\right)^2}\right)^{-2}$. Therefore, since $r_1<-\frac{\Gamma}{\alpha^j}\left(\frac{1}{2}-\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*}{2\left(b^*-a^*\right)^2}\right)^{-2}<0$, in an equilibrium $\frac{\partial t^*}{\partial\gamma}<0$ if $f^{j\prime}(\chi)<r_1$ and $\frac{\partial t^*}{\partial\gamma}>0$ if $f^{j\prime}(\chi)\in(r_1,\rho)$, where $\rho\equiv-\frac{\Gamma}{\alpha^j}\left(\frac{1}{2}-\frac{u\left(y^j+t^{j*}\right)-u\left(y^j\right)+Kg^*}{2\left(b^*-a^*\right)^2}\right)^{-2}$. □

Appendix B: Proofs for Chapter 2

B1 Proof of Lemma 1.

The proof is divided in two steps. First I prove that an equilibrium implies $\mu_A^* < \mu_B^*$, and then I prove $\mu_A^* \le \theta^{e*} \le \mu_B^*$.

B1.1 Let $\{\mu'_A, e', \mu'_B, E'\}$ be an equilibrium. Suppose that $\mu'_B \le \mu'_A$. Then there are three possible cases.

Case 1 $\mu'_B \le \theta^e \le \mu'_A$.

$\theta^{e'}$ is defined by the condition

$$\frac{\mu_a + \mu_B}{2} + \frac{k_A e_A - k_B e_B}{2(\mu_A - \mu_B)} + \frac{\gamma\phi \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \left(\frac{t_A(a + k_A e_A + \varepsilon - \hat{\varepsilon})}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B(a + k_B e_B + \varepsilon - \hat{\varepsilon})}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}} \right) de}{2(\mu_A - \mu_B)}.$$

Then, given μ'_A, it is the clear that $\left.\frac{\partial \theta^e}{\partial \mu_B}\right|_{\{\mu'_A, \mu'_B, e'_A, e'_B\}} \ge 0$. Since *B* maximizes her expected utility given by:

$\pi_B^e = \theta^e(\mu_A, e_A, \mu_B, e_B) - C(1 - \mu_B) - h(e_B)$, then in this case it follows that $\left.\frac{\partial \pi_B^e}{\partial \mu_B}\right|_{\{\mu'_A, \mu'_B, e'_A, e'_B\}} = \left.\frac{\partial \theta^e}{\partial \mu_B}\right|_{\{\mu'_A, \mu'_B, e'_A, e'_B\}} + C'(1 - \mu'_B) > 0$, which violate the first order conditions that characterizes the equilibrium and there exist a $\mu_B^* \in [0,1]$ such that $\mu_B^* > \mu'_B$ and $\pi_B(\mu_B^*) > \pi_B(\mu'_B)$.

Case 2 $\theta^{e'} \le \mu'_B \le \mu'_A$.

In this case $\theta^{e'}$ is defined by

$$\frac{\mu_a+\mu_B}{2}-\frac{k_Ae_A-k_Be_B}{2(\mu_A-\mu_B)}-\frac{\gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A(a+k_Ae_A+\varepsilon-\hat{\varepsilon})}{a+k_Ae_A+2\varepsilon-\hat{\varepsilon}}-\frac{t_B(a+k_Be_B+\varepsilon-\hat{\varepsilon})}{a+k_Be_B+2\varepsilon-\hat{\varepsilon}}\right)de}{2(\mu_A-\mu_B)},$$

then in this case $\left.\frac{\partial\theta^e}{\partial\mu_A}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}\geq 0$.

Competitor *A* chose a μ_A to maximize her expected utility given by equation $\pi_A^e=1-\theta^e(\mu_A,e_A,\mu_B,e_B)-c(\mu_A)-h(e)$.

Then is the case that $\left.\frac{\partial\pi_A^e}{\partial\mu_A}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}=-\left.\frac{\partial\theta^e}{\partial\mu_A}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}-c'(\mu'_A)<0$, thus there exists a $\mu_A^*<\mu'_B$ such that $\pi_A(\mu_A^*)>\pi_A(\mu'_A)$.

Case 3 $\mu'_B\leq\mu'_A\leq\theta^{e'}$.

In this case $\theta^{e'}$ is defined by the following condition:

$$\frac{\mu_a+\mu_B}{2}-\frac{k_Ae_A-k_Be_B}{2(\mu_A-\mu_B)}-\frac{\gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A(a+k_Ae_A+\varepsilon-\hat{\varepsilon})}{a+k_Ae_A+2\varepsilon-\hat{\varepsilon}}-\frac{t_B(a+k_Be_B+\varepsilon-\hat{\varepsilon})}{a+k_Be_B+2\varepsilon-\hat{\varepsilon}}\right)de}{2(\mu_A-\mu_B)}. \quad (59)$$

Then we have, in this case we have that:

$\left.\frac{\partial\theta^e}{\partial\mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}\geq 0$.

Since the expected utility for *B* is given by:

$\pi_B^e=\theta^e(\mu_A,e\ ,\mu_B,e_B)-C(1-\mu_B)-H(e_B)$, then in this case it follows that $\left.\frac{\partial\pi_B^e}{\partial\mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}=\left.\frac{\partial\theta^e}{\partial\mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}}+C'(1-\mu'_B)>0$. This last violates the first order conditions and therefore there exists a $\mu_B^*>\mu'_B$, such that $\pi_B(\mu_B^*)>\pi_B(\mu'_B)$.

Since these three cases are exhaustive, we conclude that any set $\{\mu'_A,\mu'_B,e',E'\}$ with $\mu'_B\leq\mu'_A$ cannot be an equilibrium.

B2 Since utility function of the program distance is symmetric, to prove that $\mu_A^* \le \theta^{e*} \le \mu_B^*$, is sufficient to consider the case when $\mu'_A < \mu'_B \le \theta^{e'}$.

In this case $\theta^{e'}$ is defined by condition (59) and then it follows that $\left.\frac{\partial \theta^e}{\partial \mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}} \le 0$.

In general the expected utility for politician *B* is given by the equation $\pi_B^e = 1 - \theta^e\left(\mu_A, e, \mu_B, E\right) - C\left(1-\mu_B\right) - H\left(E\right)$.

Since *B* chooses μ_B to maximize her expected utility, then, in this case, it follows that $\left.\frac{\partial \pi_B^e}{\partial \mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}} = -\left.\frac{\partial \theta^e}{\partial \mu_B}\right|_{\{\mu'_A,\mu'_B,e'_A,e'_B\}} + C'\left(1-\mu'_B\right) > 0$, which violates the first order conditions.

Therefore, any allocation $\{\mu'_A, \mu'_B, e'_A, e'_B\}$ such that $\mu'_A < \mu'_B \le \theta^{e'}$, cannot be an equilibrium. □

B3 Proof of Lemma 2.

If condition (35) holds then the values for *a*, θ, γ, $\bar{e}$, k_j and t_j for $j = A, B$ are such that $\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}} U_{l=j}\left(j\middle|t_j\right)d\varepsilon > \phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}} U_{l=j}\left(-j\middle|t_{-j}\right)d\varepsilon$ for $j = A, B$ and $U\left(\mu_B, A\right) < U\left(\mu_B, B\right)$ for any $e_j \in [0, \bar{e}]$. Since $\left(l-\mu_j\right)^2$ is continuous and monotone, then there exist a unique value $\theta^e \in \left(\mu_A, \mu_B\right)$ such that $\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}} U_{\theta^e}\left(j\middle|t_j\right)d\varepsilon = \phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}} U_{\theta^e}\left(-j\middle|t_{-j}\right)d\varepsilon$. □

B4 First Order Conditions.

The conditions that characterize the solution of the maximization problem for the political competitors are obtained by applying the Kuhn-Tucker theorems. In the case of competitor *A*, the first order conditions for (32), are the following:

$$\left[\frac{\partial\theta^e}{\partial\mu_A} - c'\left(\mu_A\right)\right]\left(1+\lambda_1\right)+\lambda_2-\lambda_3=0$$

$$\left[\frac{\partial\theta^e}{\partial e_A} - h'\left(e_A\right)\right]\left(1+\lambda_1\right)+\lambda_4-\lambda_5=0$$

$$\lambda_1\left(\theta^e - c\left(\mu_A\right) - h\left(e_A\right)\right)=0$$

$$\theta^e - c\left(\mu_A\right) - h\left(e_A\right)\geq 0,\quad \lambda_1\geq 0$$

$$\mu_A\lambda_2=0,\quad \mu_A\geq 0,\quad \lambda_2\geq 0$$

$$\left(1-\mu_A\right)\lambda_3=0,\quad 1-\mu_A\geq 0,\quad \lambda_3\geq 0$$

$$e_A\lambda_4=0,\quad e_A\geq 0,\quad \lambda_4\geq 0$$

$$\left(\overline{e}-e_A\right)\lambda_5=0,\quad \overline{e}-e_A\geq 0,\quad \lambda_5\geq 0$$

where $\lambda_i,\ i=1,2,...,5$, are the Lagrange multipliers for competitor *A*'s problem.

Similarly, in the case of competitor *B*, the first order conditions obtained by applying the Kuhn-Tucker theorems to problem (33), are:

$$\left[-\frac{\partial\theta^e}{\partial\mu_B} + C'\left(1-\mu_B\right)\right]\left(1+\hat{\lambda}_1\right)+\hat{\lambda}_2-\hat{\lambda}_3=0$$

$$\left[-\frac{\partial\theta^e}{\partial\mu_B} - h'\left(e_B\right)\right]\left(1+\hat{\lambda}_1\right)+\hat{\lambda}_4-\hat{\lambda}_5=0$$

$$\hat{\lambda}_1\left(\left(1-\theta^e\right) - C\left(1-\mu_B\right) - h\left(e_B\right)\right)=0$$

$$\left(1-\theta^e\right) - C\left(1-\mu_B\right) - h\left(e_B\right)\geq 0,\quad \hat{\lambda}_1\geq 0$$

$$\mu_B\hat{\lambda}_2=0,\quad \mu_B\geq 0,\quad \hat{\lambda}_2\geq 0$$

$$\left(1-\mu_B\right)\hat{\lambda}_3=0,\quad 1-\mu_B\geq 0,\quad \hat{\lambda}_3\geq 0$$

$$e_B\hat{\lambda}_4=0,\quad e_B\geq 0,\quad \hat{\lambda}_4\geq 0$$

$$\left(\overline{e}-e_B\right)\hat{\lambda}_5=0,\quad \overline{e}-e_B\geq 0,\quad \hat{\lambda}_5\geq 0$$

where $\hat{\lambda}_i,\ i=1,2,...,5$, are the Lagrange multipliers for competitor *B*'s problem and

$$\frac{\partial \theta^e}{\partial \mu_A} = \frac{1}{2} + \frac{k_A e_A - k_B e_B}{2\left(\mu_B - \mu_A\right)^2} + \frac{\gamma\phi \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \left(\frac{t_A\left(a + k_A e_A + \varepsilon - \hat{\varepsilon}\right)}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B\left(a + k_B e_B + \varepsilon - \hat{\varepsilon}\right)}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}} \right) de}{2\left(\mu_B - \mu_A\right)^2},$$

$$\frac{\partial \theta^e}{\partial \mu_B} = \frac{1}{2} - \frac{k_A e_A - k_B e_B}{2\left(\mu_B - \mu_A\right)^2} - \frac{\gamma\phi \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \left(\frac{t_A\left(a + k_A e_A + \varepsilon - \hat{\varepsilon}\right)}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B\left(a + k_B e_B + \varepsilon - \hat{\varepsilon}\right)}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}} \right) de}{2\left(\mu_B - \mu_A\right)^2},$$

$$\frac{\partial \theta^e}{\partial e_A} = \frac{k_A}{2\left(\mu_B - \mu_A\right)} + \frac{\gamma\phi t_A k_A \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon\left(a + k_A e_A + 2\varepsilon - \hat{\varepsilon}\right)^{-2} de}{2\left(\mu_B - \mu_A\right)},$$

$$\frac{\partial \theta^e}{\partial e_B} = -\frac{k_B}{2\left(\mu_B - \mu_A\right)} - \frac{\gamma\phi t_B k_B \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon\left(a + k_B e_B + 2\varepsilon - \hat{\varepsilon}\right)^{-2} de}{2\left(\mu_B - \mu_A\right)}.$$

The characterization of the different type of equilibria, both, for the incomplete information and the complete information cases, are obtained from these first order conditions.

B5 Proof of Result 6.

i) From condition (52), and since its both sides are decreasing on e_j, it must be the case that $e_A^* = e_B^*$,. Then from (48) and (49), $\mu_A^* = 1 - \mu_B^*$ and then (34) implies $\theta^e = \frac{1}{2}$.

ii) It follows directly from condition (52).

iii) From the second part of the result it follows that $e_A^* = e_B^*$. Then if $t_A > (<) t_B \; c(\cdot) \equiv C(\cdot)$, from conditions (48) and (49), and assumptions (28) and (29), it follows that $\mu_A^* > (<) 1 - \mu_B^*$ respectively. From the condition (34)

that defines θ^e, it follows straightforward that $\theta^e - \mu_A^* > (<)\, \mu_B^* - \theta^e$ and $\theta^e > (<)\frac{1}{2}$. □

B6 Proof of Result 7.

Totally differentiating the system of equations (48), (49), (50), and (51) and (44) ,and after some algebra the solution for $\frac{de_j^*}{d\gamma}$ is:

$$\frac{\mathrm{X}_{-j}\mathrm{M}_j\hat{\mathrm{E}}_{-j} + 2\Delta\mathrm{E}_{-j}\left(\mathrm{M}_{-j}h'\left(e_j\right) - \mathrm{M}_j h'\left(e_{-j}\right)\right) - 2\Delta\Omega\hat{\mathrm{E}}_{-j}h'\left(e_j\right)}{\mathrm{X}\hat{\mathrm{E}}_j\hat{\mathrm{E}}_{-j} + 2\Delta\left(\hat{\mathrm{E}}_{-j}h'\left(e_j\right)\mathrm{E}_j - \hat{\mathrm{E}}_j h'\left(e_{-j}\right)\mathrm{E}_{-j}\right)} \quad (60),$$

where:

$$\Delta \equiv 1 - \frac{C''\left(1-\mu_B^*\right)}{c''\left(\mu_A^*\right)},$$

$$\mathrm{X}_A \equiv \Delta\left(\frac{k_A e_A - k_B e_B + \gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A\left(a + k_A e_A + \varepsilon - \hat{\varepsilon}\right)}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B\left(a + k_B e_B + \varepsilon - \hat{\varepsilon}\right)}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}}\right)de}{\left(\mu_B^* - \mu_A^*\right)^3}\right) - c''\left(\mu_A^*\right)$$

$$\mathrm{X}_B \equiv \Delta\left(\frac{k_A e_A - k_B e_B + \gamma\phi\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left(\frac{t_A\left(a + k_A e_A + \varepsilon - \hat{\varepsilon}\right)}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B\left(a + k_B e_B + \varepsilon - \hat{\varepsilon}\right)}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}}\right)de}{\left(\mu_B^* - \mu_A^*\right)^3}\right) + C''\left(1-\mu_A^*\right)$$

,

$$\mathrm{M}_j \equiv t_j \Phi k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \frac{\varepsilon}{\left(a + k_j e_j + 2\varepsilon - \hat{\varepsilon}\right)^2} d\varepsilon ,$$

$$\hat{\mathrm{E}}_j \equiv 2\left(\mu_B^* - \mu_A^*\right) h''\left(e_j\right) + t_j \phi k_j^2 \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \frac{\varepsilon}{\left(a + k_A e_A + 2\varepsilon - \hat{\varepsilon}\right)^3} d\varepsilon ,$$

$$\mathrm{E}_j \equiv \frac{k_j}{2\left(\mu_B^* - \mu_A^*\right)} + \gamma t_j k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \frac{\varepsilon}{\left(a + k_j e_j + 2\varepsilon - \hat{\varepsilon}\right)^2} de ,$$

$$\Omega \equiv \gamma\phi \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \left(\frac{t_A\left(a + k_A e_A + \varepsilon - \hat{\varepsilon}\right)}{a + k_A e_A + 2\varepsilon - \hat{\varepsilon}} - \frac{t_B\left(a + k_B e_B + \varepsilon - \hat{\varepsilon}\right)}{a + k_B e_B + 2\varepsilon - \hat{\varepsilon}} \right) de .$$

The first part of the result follows straightforward from (60).

If $k_j > k_{-j}$, then $\mathrm{X} > 0$, $\Delta > 0$, $\Omega < 0$.

Then if $k_j > k_{-j}$ the denominator of (60) is positive and the denominator is negative if $\frac{2\Delta}{\mu_B^* - \mu_A^*}\left(\hat{\mathrm{E}}_{-j}^{-1} h'\left(e_{-j}^*\right)^2 - \hat{\mathrm{E}}_j^{-1} h'\left(e_j^*\right)^2\right)\mathrm{X}^{-1} > 1$ holds, then $\frac{de_j^*}{d\gamma} < 0$.□

B7 Proof of Result 8.

By Result 6, $e^* = E^*, \theta^e - \mu_A^* = \mu_B^* - \theta^e$, $\mu_A^* = 1 - \mu_B^*$ and $\theta^e = \frac{1}{2}$ hold in the symmetric case, both with private information and with complete information. Note that result 7 implies that $\mu_A^* = \mu_A^{**}$ and $\mu_B^* = \mu_B^{**}$, where μ_A^* and μ_B^* are the equilibrium positions with perfect information and μ_A^{**} and μ_B^{**} are the equilibrium positions with private information, is always the case.

Therefore by first order conditions (43) and (44), it is the case that the condition

$$\frac{k_j + \gamma}{h'\left(e_j^*\right)} = \frac{k_j + \gamma\phi t_j k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon\left(a + k_j e_j^{**} + 2\varepsilon - \hat{\varepsilon}\right)^{-2} d\varepsilon}{h'\left(e_j^{**}\right)} \quad (61),$$

always must hold. If trust in political institutions is high, according with our definition, then

$\phi t_j k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon \left(a + k_j e_j^{**} + 2\varepsilon - \hat{\varepsilon} \right)^{-2} d\varepsilon < 1$. It follows that if citizens have a high confidence in the political system it is the case that $\frac{k_j + \gamma}{h'\left(e_j^*\right)} < \frac{k_A + \gamma\phi t_j k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon \left(a + k_j e_j^* + 2\varepsilon - \hat{\varepsilon} \right)^{-2} d\varepsilon}{h'\left(e_j^*\right)}$, and therefore, by assumptions (30), $e_j^{**} > e_j^*$ must hold to guaranty condition (61). In contrast, if confidence in the political system is low, then $\phi t_j k_j \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \varepsilon \left(a + k_j e_j^{**} + 2\varepsilon - \hat{\varepsilon} \right)^{-2} d\varepsilon > 1$, and therefore, $e_j^{**} > e_j^*$. □

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