Foreign Aid and Policies under Asymmetric Information*

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Abstract

It is often difficult for external agents understanding to what extent the preferences of a government are directed towards welfare enhancing policies and reforms. I develop a principal-agent model in which a domestic lobby attempts to influence the government's policy choices by means of monetary transfers while the weight the government attaches to public welfare is private information. I observe that asymmetric information generally leads to a larger policy distortion in equilibrium. This simple setting serves as a benchmark for the comparison with a commom agency framework. An International Financial Institution giving policy conditional aid to the government is included as an additional principle in the analysis. Its policy objective is in conflict with the lobby's one. Whether the equilibrium distortion results lower or higher depends on the range of uncertainty over the government's preferences and on the degree of benevolence of the government.

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1 Introduction

Foreign aid is typically disbursed to the hands of recipient countries' governments. However, it is often difficult for an International Donor to understand the real commitment of the governments to public welfare enhancing policies and reforms. The same occurs within the country to the interest groups which do actively influence the policy choices. The governments might find it convenient to hyde their preferences in order to extract more resources. If the government is not seen as a unitary actor, but as a "two-soul" entity in which both benevolent politicians and corrupt bureaucrats are present, the relative weight of the two components might be difficult to detect from outside. The uncertainty over the government's preferences is particularly high when we deal with neo-elected governments. Initially I only consider the interaction between the government and a domestic special interest group. The government's utility linearly depends on aggregate welfare and on the contribution received by the active lobby. I allow the government to have private information over the relative weight attached to the public welfare with respect to the payment obtained (I name this weight as the "consensus parameter"). Taking into account how the New Regulatory Economics literature[1] deals with the problem of policy influence by special interest groups, informational asymmetries and the trade-off between allocative inefficiency and information rent extraction are central issues. Monetary transfers can be used to reduce informational conflicts. In this perspective, the political power of a group is related to its ability to gain some informational rent. In general the Incentive Theory states that asymmetric information may produce some distortion towards the ideal point of the informed party. In the single agent model before and in the common agency model, once the international financial institution is introduced, the principal's contribution has a double role. As in a standard pincipal-agent model it serves as a political influence instrument. In addition, it becomes the screening device to induce the government to reveal its private information. Asymmetric information allows the government to extract a positive information rent whatever its preferences are, except at the top of the distribution. When the IFI enters the game the context is one of conflicting principals as the lobby's preferences towards policies are opposite. While under complete information the competition between the two principals drives to a less distorted equilibrium

[1] See Laffont and Tirole (1993) for a specification of this literature.

than if the lobby was playing alone with the government, under asymmetric information the equilibrium outcome is not always favorable to the international financial institution. The size of the uncertainty (the range of the distribution of the "consensus parameter") plays an important role.

In section 2 I develop the model with a single principal and under complete information. In section 3 the model is extended to asymmetric information. Section 4 presents the common agency case, both under complete and asymmetric information.

2 The model

The political setting is characterized by a government which has all the policy decision power. Its reform choice, named τ, assumes 0 value when it is optimally implemented and a positive value when it produces a distortion. The welfare of the political authorities negatively depends on the suboptimal level of reform obtained and positevely on a contribution received by a reform adverse lobby group. This positive payment does not produce any effects on the aggregate economy. It solely induces the government to opt for a distortion. The typical principal-agent game that describes such a situation was developed by Grossman and Helpman (1994)[2] in the context of trade tariffs on import goods. Their results show that in equilibrium a certain distortion is produced in return for a certain contribution. If the economy is marked by only one group interested in trade protection the contribution results in the minimum amount necessary to compensate the government from the decrease in general welfare caused by the distortion. When more lobbies are competing each other to influence the outcome of the policy the aggregate contribution received by the government is larger. The aim of the present work is to extend this setting to an asymmetric information context at the presence of an International Donor giving aid to the country. The agent's utility is a linear combination of the aggregate economic welfare weighted for a parameter representing the government's preferences for the public welfare and the contribution schedule offered by the Special Interest Group (SIG).

[2] Grossman and Helpman build their framework on the common agency model developed by Bernheim and Whinston (1986).

The equilibrium distortion negatively depends on this parameter. I assume that the "consensus parameter" is government's private information. The lobby cannot observe a before offering the contribution. Government's welfare is given by

$$G(\tau, a) = aW(\tau) + C(\tau) \tag{1}$$

where the aggregate welfare $W(\tau)$ negatively depends on the level of distortion τ at an increasing rate ($W_\tau < 0$ and $W_{\tau\tau} < 0$) and a is the parameter identifying the attention to public consensus (or also the quality of institutions). The SIG does not observe the government's "ideological type". It is drawn from $\Lambda = [0, \overline{a}]$[3], the continuum of values between 0 and a strictly positive upper bound of a ($\overline{a}$), according to a distribution $\Phi(a)$ and an associated density function $\phi(a) > 0$. Economic welfare is maximized when there is no distortion ($\tau = 0$). In order to identify an explicit solution to the problem, I define it with the following function that satisfies the stated

assumptions.

$$W(\tau) = (\overline{Z} - \tau^2) \tag{2}$$

The government's objective function becomes

$$G(\tau, a) = a(\overline{Z} - \tau^2) + C(\tau) \tag{3}$$

The lobby's utility, net of the contribution, is given by

$$L(\tau) = U(\tau) - C(\tau) \tag{4}$$

[3] The consensus parameter $a = (\frac{b}{1-b})$, can be considered as the relative weight for the public compared to the weight attached at the contribution in the governemnt's utility. We name b the weight associated to the public consensus and $(1 - b)$ the weight of the contribution (where $0 \leq b \leq 1$).

where gross utility increases with the amount of distortion at a decreasing rate ($U_\tau > 0$ and $U_{\tau\tau} < 0$). I give an explicit function for $U(\tau)$ too:

$$U(\tau) = -(\tau - \overline{Q})^2 \tag{5}$$

Assumptions $U\tau > 0$ and $U_{\tau\tau} < 0$ hold when we resctrict the set of existence of τ to $[0, \overline{Q}]$. Lobby's net utility results in

$$L(\tau) = -(\tau - \overline{Q})^2 - C(\tau) \tag{6}$$

Before allowing for asymmetric information, I characterize the equilibrium outcome in the case of complete information. The political authorities and the lobby play a two stage non cooperative game in which the SIG acts first, offering (and committing to) a contribution schedule that associates a certain amount of payment to each suboptimal level of reform implemented. In the second period, after observing the funding plan, the government chooses the degree of reform to implement in order to maximize its objective function. As in Grossman and Helpman (1994) I limit the analysis to truthful equilibria that guarantee a reliable committment on the lobby's side. Morever, as the vested interest group does not face any competition in influencing the authorities, the given contribution exactly equals the difference between the government's utility when the reform is completely implemented (and the lobby is not active) and the amount due to the suboptimal level reached in equilibrium. The contribution is assumed to be feasible, that is it never exceeds the total amount of resources of the lobby. Therefore, the distortion driving to a Subgame Perfect Nash Equilibrium (SPNE) comes from the solution of the simoultaneous maximizations of the objective function of the government and of the coalition formed by the joint utility of the government and the lobby[4]. When these conditions are both satisfied the contribution is truthful, because the marginal cost of financing the government equals the

[4]See Grossman and Helpman (1994) for a detailed description of the equilibrium conditions.

marginal benefit derived from an increase in the distortion. Solving the first order conditions gives

$$-2a\tau + C\tau = 0 \tag{7}$$

$$-2a\tau + C_\tau - 2(\tau - \overline{Q}) - C\tau = 0 \tag{8}$$

from which we can define the suboptimal level of reform occurring in equilibrium as a function of the consensus parameter:

$$\tau^* = \frac{\overline{Q}}{1+a} \tag{9}$$

The more benevolent is the government (the larger is a) towards the general public the lower is the distortion. Parameter a is exogenouos. On the contrary, the larger is the distortion desired by the lobby ($\overline{Q}$), the greater is the distortion in equilibrium[5].

The resulting contribution in equilibrium becomes $C(\tau^*) = a(\tau^*)^2 \geq 0$[6]. Observe that the contribution is strictly positive except for the cases in which the distortion or the consensus parameter are null. When there is no distortion the lobby has no incentive in giving payments to the government. The same holds when the government has no interest at all in the public welfare. In this latter case, the equilibrium distortion is the highest possible ($\overline{Q}$), but the result is not driven by the political influence of the lobby. When a "bad" government is in place the SIG potentially acquires its objective at zero cost[7]. Anyway, the equilibrium contribution rises as a increases[8]. The lobby needs to contribute more to convince a relatively more altruistic government to implement a distortion.

[5] $\overline{Q}$ is also exogenously given.

[6] The equilibrium contribution is derived from $aW(\tau^*) + C(\tau^*) = aW(0)$ where $W(0)$ is the government's payoff obtained by in the absence of lobbying activity.

[7] ...... considerations about the potential endogeneity of a

[8] Substituting the value of a derived from (3.9) in the equation of the equilibrium contribution and calculating the first derivative with respect to a yields $\partial C^* / \partial a = [\overline{Q}^2(1-a^2)/(1+a)^4] > 0$, for $a < 1$.

3 Asymmetric information

Now I consider a situation in which the government knows its ideology parameter, while the vested interest group does not own such an information. The problem can be examined as a Principal-Agent setting with asymmetric information.

The lobby (principal) has to submit a payoff maximizing contract to the political authorities who already possess a private information when contracting takes place. The government's and the lobby's utilities functions are respectively defined as

$$G(\tau, a) = aW(\tau) + C(a) = a\left(\overline{Z} - \tau^2\right) + C(a) \tag{10}$$

$$L(\tau) = U(\tau(a)) - C(a) = -(\tau(a) - \overline{Q})^2 - C(a) \tag{11}$$

The timing of the game is slightly different. In the first stage the lobby offers a contract, based on a schedule which combines a monetary contribution to each distortion value, in order to induce the government to reveal its consensus preferences. In the last period the government decides the degree of reform to implement. As the distortion is produced the contribution takes place. The government is required to announce its type before the contract is submitted. Perfect commitment of the lobby is assumed since the focus of the analysis is on truthful equilibria. The SIG has to maximize its welfare by offering a contract $(\tau(a), C_G(a), C_L(a))$. For a Bayesian Nash Equilibrium (BNE) to be reached, it is necessary to implement an incentive efficient choice function $f(a) = (\tau(a), C(a))$[9] that gives the government an expected welfare at least equal to its reservation utility, for each possible value of a. Thanks to the Revelation Principle for BNE, the equilibrium induced by a choice

[9] By assumption here the same contribution function positevely enters the government's objective function and negatively enters the lobby's utility function. When linear utility functions are considered, this condition is sufficient for Bayeasian incentive compatibility to hold.

function that maps each possible government's ideology type into the levels of distortion and contribution can be replicated by means of a direct revelation mechanism that induces truth-telling. As a consequence, the principal can limit the search of such choice functions to the set of Bayesian incentive compatible (BIC) ones.

The lobby's original problem is to maximize its expected payoff with respect to the choice function, subject to incentive compatibility and individual rationality constraints. Incentive compatibility guarantees that truthtelling is an optimal strategy for the government and individual rationality represents the participation constraint for the agent. The government has to obtain at least the same utility it would get if it did not receive the contribution ($\overline{G}(a) = a\overline{Z}$)[10], otherwise it will not accept to take part in the contract. $\overline{G}(a)$ is the government's reservation utility.

$$\max_{f(a)=(d(a),C_G(a),C_L(a))} E[U(\tau(a)) - C_L(a)] \tag{12}$$

$$\text{s.t.} \qquad f(a) \;\; \text{BIC} \tag{13}$$

$$a(Z-\tau^2) + C(\tau) \geq a\overline{Z}, \;\text{ for each } a \in [0, \overline{a}] \tag{14}$$

I define the government's utility when it reveals its true preference a as $G_1(a) = \; a(\overline{Z} - \tau(a)^2) + C(\tau(a))$. Moreover, as $C_G(a) = C_L(a)$ the problem can be restated as follows:

$$\max_{d(a),G_1(a)} \int_0^{\overline{a}} [-(\tau(a) - \overline{Q})^2 - G_1(a) + a(\overline{Z} - \tau(a)^2)]\phi(a)da \tag{15}$$

$$\text{s.t.} \qquad \tau(a) \text{ non increasing}^{11} \tag{16}$$

$$G_1(a) = G_1(0) + \textstyle\int_0^a W(\tau(s))ds \tag{17a}$$

$$G_1(a) = \overline{a}Z \tag{18}$$

[10] The value of the distortion that maximizes the government's objective function when there is no contribution is $\tau = 0$.

where (3.16) and (3.17) are respectively the necessary and sufficient condition for incentive compatibility to hold. The participation constraint, equation (3.18), binds in correspondence of the highest value of a[12].

The solution to the constrained maximization gives the optimal value of the distortion under asymmetric information:

$$\tau^*_{AI} = \frac{\overline{Q}}{1 + [a - \frac{1-\Phi(a)}{\phi(a)}]} \tag{19}$$

The equilibrium distortion is a function of a and of its distribution. For the IC necessary condition to hold we need to have $\partial[\frac{1-\Phi(a)}{\phi(a)}]/\partial a < 0$[13]. In order to identify an explicit solution I assume a uniform distribution of a for which the above condition is always satisfied. This implies

$$\tau^*_{AI} = \frac{\overline{Q}}{1 + 2a - \overline{a}} \qquad a \geq \frac{\overline{a}}{2} > \frac{\overline{a} - 1}{2} \tag{20}$$

$$\tau^*_{AI} = 0 \qquad otherwise \tag{21}$$

Observe that imposing $\tau^*_{AI} < \overline{Q}$ (the necessary condition to have a distortion increasing utility for the lobby) is sufficient to allow for a non negative τ^*_{AI}. The distortion produced in equilibrium with asymmetric information is higher than τ^* except that for the upper bound value of the distribution. When $a = \overline{a}$, the distortion does not change with respect to the complete information solution. The distortion is the same when the government is purely benevolent and an upward distortion is present whenever the uncertainty over government's preferences is very high. The government derives a positive information rent whatever its preferences over a are. The lobby succeeds in inducing truthtelling only for values of a which are larger than the average size of the distribution. The intuition for that lies in the fact that

[12] $G_1(0) = 0\overline{Z} = 0$ is less restrictive. When the binding constraint holds this is always verified.

[13] In Appendix 1 I derive the above solution.

offering a positive contribution to relatively bad governments may induce a good government to mimic less altruistic preferences. From the government's participation constraint I derive the contribution offered in equilibrium:

$$C^{AI}(\tau^*_{AI}) = (\overline{a} - a)\overline{Z} + a(\tau^*_{AI})^2 \qquad a > \frac{\overline{a}}{2} \tag{22}$$

$$C^{AI}(\tau^*_{AI}) = 0 \qquad otherwise \tag{23}$$

For each level of distortion the lobby has to contribute more to induce the government to choose the same degree of distortion than if complete information were available. For each level of the consensus parameter of the government, the higher is the uncertainty, the larger is the resulting contribution. This explains the reason for which the equilibrium distortion is increasing in $\overline{a}$. Except for the case in which the government is purely benevolent ($a = \overline{a}$), for any other value of its consensus parameter the government obtains a positive information rent[14] at the optimal contract. The marginal contribution with respect to a is negative[15]. The SIG has to design its offer in such a way as to induce the government to reveal its true preferences for the public welfare. The only way is to reduce the payment attached to higher values of a. This result is opposite to the one observed under complete information, where the marginal contribution was increasing in the consensus parameter.The government, unless being purely benevolent, obtains benefits from hyding its preferences before taking part in the contract, because it acquires a positive information rent. Anyway the interaction between the government and the special interest group is less welfare erosing under complete information.

[14] Information rent is defined as the the amount the agent's utility that exceeds its complete information reservation utility. Here it is given by $(\overline{a} - a)\overline{Z}$. For a totally benevolent government it is null, while for less altruistic governments it is always strictly positive.

[15] Substituing the equilibrium solution for τ_{AI} in the equilibrium contribution equation from (22), I can calculate $\partial C_{AI}/\partial a < 0$. Note that the marginal contribution is negative for any value of a suitable for the contract to be offered.

4 Conflicting principals

I now introduce the presence of an International donor offering foreign assistance to the country in order to verify whether its effects on the policy outcome produce an improvement for the country. In this setting the government is a single agent who faces two principals, the lobby and the IFI having conflicting interests. The SIG wishes to induce the implementation of a distortion as close as possible to its desired level ($\overline{Q}$[16]). The IFI's net utility instead is completely aligned to the economic welfare of the country. In order to induce the government to pursue the implimentation of reforms it offers an assistance schedule depending on τ. I address the case of conditional aid[17]. The utility function of the lobby is the same as before:

$$L(\tau) = U(\tau) - C(\tau) = -(\tau - \overline{Q})^2 - C(\tau) \tag{24}$$

The IFI's objective function here is given by

$$I(\tau) = W(\tau) - A(\tau) = \overline{Z} - \tau^2 - A(\tau) \tag{25}$$

The government receives two payment schedules to be forced to divert its policy decision in opposite directions.

$$G(a, \tau) = aW(\tau) + A(\tau) + C(\tau) = a(\overline{Z} - \tau^2) + A(\tau) + C(\tau) \tag{26}$$

The same assumptions about τ and a are maintained: $\tau \in [0, \overline{Q}]$ and a is uniformly distributed over $a \in [0, \overline{a}]$.

[16] Note that, following previous assumptions, $\overline{Q}$ is also the largest possible distortion as $\tau \in [0, \overline{Q}]$.

[17] Conditionality here implies that the amount of assistance disbursed depends on which degree of policy (distortion) is implemented.

4.1 Complete information

In order to identify a benchmark for comparison I firstly derive the equilibrium solution in the case of complete information.The problem reduces to a common agency framework. Both the principals' payments enter linealry in the government's objective function. The underlying assumptions are that both the contribution of the lobby and amount of aid received do not have a direct effect on economic welfare, but only an indirect one through policies. The reasons for that are mainly technical. As this case has to serve as a benchmark I wanted to keep the same functional forms I use in the asymmetric information context. I later discuss the problems related to accomplish this analysis when dealing with the multiprincipal case. A payment function entering nonlinearly in the welfare function would complicate the treatment even more[18]. The original underlying model to address when solving common agency models is Bernheim and Whinston (1984). Following them, I derive the optimal distortion as the one maximizing at the same time the payoff of the government and the joint aggregate utility of the government and the two principals. This yields to the following f.o.c.s:

$$-2a\tau + A_\tau + C_\tau = 0 \tag{27}$$

$$-2a\tau - 2\tau - 2(\tau - \overline{Q}) = 0 \tag{28}$$

that lead to the following optimal distortion in the presence of an aid financing institution,

$$\tau_A^* = \frac{\overline{Q}}{2+a} \tag{29}$$

Observe that the distortion outcome is lower than in the absence of aid. The fact that the international donor is purely benevolent amplifies the marginal effect of the distortion on the aggregate welfare. The total payment

[18]The alternative assumption that aid directly influences public welfare, as in Montanari(2007), is certainly reasonable, but here we limit the analysis to the simpler case in order to focus on the different effects under complete and asymmetric information.

received by the government in equilibrium is higher. The total contribution received by the government, when it accepts payments from both the principals has to be $C(\tau) + A(\tau) \geq a\tau_A^{*2}$[19] Each principal's contribution has to compensate the coalition formed by the government and the other principal from what it gains from the equilibrium distortion. Otherwise, the government could decide to accept the contribution only from one principal. The lobby's contribution results in

$$C(\tau_A^*) = \max\{0, (1+a)\tau_A^{*2}\} \tag{30}$$

and the IFI's assistance in

$$A(\tau_A^*) = \{0, (1+a)(\tau_A^{*2} - \tau^{*2}) - 2\overline{Q}(\tau_A^* - \tau^*)\} \tag{31}$$

since the level of distortion that would be reached in equilibrium in case aid were not accepted would be the one derived in the first section, τ^*. Note that in equilibrium the aid disbursement is always positive[20]. The same occurs for the lobby's contribution[21]. The lobby contributes more than when acting alone only if the government is weakly benevolent. The marginal contribution with respect to the consensus parameter infact is always negative. It mirrors the way the consensus parameter affects the utility of the lobby. A

[19] The equilibrium contribution is derived from the government's participation constraint $a(\overline{Z} - \tau^2) + A(\tau) + C(\tau) \geq a\overline{Z}$. When only the lobby is present it has to guarantee to the government a payoff at least equal to $a\overline{Z}$. When only the IFI is present in equilibrium no assistance is disbursed since its objective is completely aligned to the government's one. Therefore the payoff obtained, absent the other principal, is still $a\overline{Z}$.

[20] If aid is not accepted by the government the equilibrium distortion is the one of the single principal case τ^*. Foreign assistance, in order to be accepted by the government, has to leave the government and the lobby jointly as well off as if aid were not given: $A(\tau_A^*) = a(\overline{Z} - \tau^{*2}) + C(\tau^*) - (\overline{Q} - \tau^*)^2 - C(\tau^*) - [a(\overline{Z} - \tau_A^{*2}) + C(\tau_A^*) - (\overline{Q} - \tau_A^*)^2 - C(\tau_A^*)]$

Semplifying and substituting the equilibrium values for τ^* and τ_A^* we obtain $A(\tau_A^*) = \overline{Q}^2/[(1+a)(2+a)^2]$ which is always positive.

[21] Similarly, observing that when the lobby is not active the elicited distortion is 0, the equilibrium contribution for the lobby is $C(\tau_A^*) = a\overline{Z} + A(0) + \overline{Z} - A(0) - [a(\overline{Z} - \tau_A^{*2}) + A(\tau_A^*) + (\overline{Z} - \tau_A^{*2}) - A(\tau_A^*)$.

Semplifying and substituting the equilibrium values for τ_A^* leads to $C(\tau_A^*) = \overline{Q}^2(1+a)/(2+a)^2$.

larger benevolence (high a) is associated to a lower distortion[22] which leads to a decrease in the lobby's utility. The marginal benefit gained from the distortion decreases as the distortion rises. Hence, considering truthful contributions, also the size of the marginal contribution tends to decrease for higher values of τ (and a more benevolent government). The total amount of payments received by the government in any case is higher than when only the lobby is present. The competition between the IFI and the SIG makes the government better off.

4.2 Asymmetric information over the government's benevolence

Let us now assume that the importance given by the government to the public welfare is its private information. Neither the lobby nor the International Financial Institution know the value a takes for the government.

As discussed in the previous section, in agency settings with a single principal, the principal problem can be restricted to the choice of a standard direct mechanism, thanks to the revelation principle. In the case of multiple principals, the agent has simouoltaneous information about the mechanisms offered by all the principals when he communicates with anyone of them. As a consequence, any principal can design a mechanism in which the allocation he selects can depend on the mechanisms that the other principals propose. This leads to the risk of complicated regress strategies[23]. In order to overcome the problem, Martimort and Stole (2002) observe that principals can offer the agent a menu of contracts as an alternative. Moreover, Peters (2001) demonstrates that in a single agent setting, for any set of indirect mechanisms feasible for the mechanism designers and for any equilibrium relative to that set, there is an equilibrium in menues that preserves the corresponding equilibrium allocation. Martimor and Semenov (2006), building up on the aforementioned results, recently treated the problem of asymmetric information in common agency policy models both as horizontal asymmetry, regarding the distance between the agent's and the principals' desired policies, and vertical asymmetry, concerning the weight given to social welfare,

[22] More precisely, larger values of a lead to an equilibrium distortion which is farther from the lobby's desired level $\overline{Q}$.

[23] See McAfee (1993).

which is consistent with the problem of my analysis. Following them, I set my conflicting principals's problem in order to analyse the equilibrium outcome.

Denote by $G(a)$ the government's payoff when he accepts the payments by both the lobby and the IFI and $\tau(a)$ the elicited distortion. The rent-distortion profile $\{G(a), \tau(a)\}$ implemented by $\{C(\cdot), A(\cdot)\}$ satisfies

$$G(a) = [a(\overline{Z} - \tau^2) + A(\tau) + C(\tau)] \tag{32}$$

$$\tau(a) = \arg\max_{\tau>0} a(\overline{Z} - \tau^2) + A(\tau) + C(\tau) \tag{33}$$

The maximization of the government's objective function[24] (from equation (3.32)) leads to the following f.o.c.

$$2a\tau = A_\tau + C_\tau \tag{34}$$

In the same way I define $\{G_L(a), \tau_L(a)\}$ and $\{G_I(a), \tau_I(a)\}$ the rent-distortion profiles associated respectively to the government accepting only the lobby's contribution or the IFI's payment[25]:

$$G_L(a) = [(\overline{Z} - \tau^2) + C(\tau)] \qquad \tau_L(a) = \arg\max_{\tau>0} a(\overline{Z} - \tau^2) + C(\tau) \tag{35}$$

$$G_I(a) = [(\overline{Z} - \tau^2) + A(\tau)] \qquad \tau_I(a) = \arg\max_{\tau>0} a(\overline{Z} - \tau^2) + A(\tau) \tag{36}$$

For a profile $\{G(a), \tau(a)\}$ to be implementable, following Lemma 1, pag. 9 in Martimor and Semenov (2006), it is sufficient to have

$G(a)$ and $\tau(a)$ almost everywhere differentiable, with, at any differentiability point, $\partial G(a)/\partial a = (\overline{Z} - \tau)^2$ and $\partial \tau/\partial a < 0$.

[24]The assumption of strict concavity of $G(a)$ with respect to a will be verified ex-post. Remember that $W_\tau < 0$ and $W_{\tau\tau} < 0$.

[25]The assumptions of strict concavity and $\partial\tau(a)/\partial a < 0$ must hold for these functions too.

The lobby's reaction function, for a given IFI's assistance $A^*(\tau)$ is such that the lobby maximizes its expected gross utility over the distribution of a, subject to the standard incentive and participation constraints. We have indeed

$$\max_{\{G(a),\tau(a)\}} E[-(\tau-\overline{Q})^2 - C(\tau)] \tag{37}$$

$$\text{s.t.} \qquad \tau \ \text{ non increasing} \tag{38}$$

$$G(a) - G(0) = \textstyle\int_0^a (\overline{Z}-s)^2 ds \tag{39}$$

$$G(a) \geq a\overline{Z}, \ \text{ for each } a \tag{40}$$

Substituting $C(\tau)$ from equation (32) into the maximand and calculating the expected value yields to

$$\max_{\{G(a),\tau(a)\}} \int_0^{\overline{a}} [-(\tau-\overline{Q})^2 - G(a) + (\overline{Z}-\tau^2) + A^*(\tau)]\phi(a)da \tag{41}$$

Similarly, the reaction function of the iFI is

$$\max_{\{G(a),\tau(a)\}} E[\overline{Z} - \tau^2 - A(\tau)] \tag{42}$$

$$\text{s.t.} \qquad \tau \ \text{ non increasing} \tag{43}$$

$$G(a) - G(0) = \textstyle\int_0^a (\overline{Z}-s)^2 ds \tag{44}$$

$$G(a) \geq a\overline{Z}, \ \text{ for each } a \tag{45}$$

that can be written as

$$\max_{\{G(a),\tau(a)\}} \int_0^{\overline{a}} [(\overline{Z}-\tau)^2 - G(a) + (\overline{Z}-\tau^2) + C^*(\tau)]\phi(a)da \tag{46}$$

A Subgame Perfect Nash Equilibrium of this common agency game under asymmetric information is given by the combination of payments $(C^*(\tau), A^*(\tau))$ which implements a rent-distortion profile $\{G^*(a), \tau^*(a)\}$ by solving the reaction functions of both the principals.

The following f.o.c.s derive from the problem

$$-2(\tau - \overline{Q}) + A^*_\tau - 2\tau(2a - \overline{a}) = 0 \quad (47)$$

$$-2\tau + C^*_\tau - 2\tau(2a - \overline{a}) = 0 \quad (48)$$

From the government's payoff maximization we know that $A^*_\tau + C^*_\tau = 2a\tau$. Summing up the first order conditions this leads to the equilibrium distortion under asymmetric information, in the presence of aid

$$\tau^*_{AAI} = \frac{\overline{Q}}{2 + 3a - 2\overline{a}} \qquad a > \frac{2\overline{a} - 1}{3} > \frac{2}{3}(\overline{a} - 1) \quad (49)$$

$$\tau^*_{AAI} = 0 \qquad otherwise \quad (50)$$

Firstly, note the simmetry with the single principal case. The distortion τ^*_{AAI} is always larger than the one generated under complete information, τ^*_A, except at the top. When the government is purely benevolent ($a = \overline{a}$) the two solutions coincide. If the range of the distribution is very large ($\overline{a} > 1$), the rent profile of the government is associated to a positive distortion only for the upper values of the consensus parameter.

The lobby has little incentive in offering a contribution to a "bad" government. The rent profile is built in such a way as to remunerate only a more reform prone government. This screening device allows to avoid "bad" governments receiving higher contribution to implement the same level of distortion they would have chosen in line with their preferences. From the IFI' s perspective instead, observe that, less altruistic governments tend to induce a worse distortion environment. The IFI's objective is totally aligned to the welfare of the country. Its role in a sense results in contrasting the action of the lobby. When the government is not benevolent the utility gained from giving assistance falls, because, everything else equal, the equilibrium distortion will be larger.

The marginal payments of the two principals are not equal. The marginal contribution (in absolute value) of the lobby is always larger[26]. This is due to the fact that the difference between its desired distortion[27] and the optimal distortion the government would choose in absence of its contribution is larger than the difference between the IFI's and the government's optimal distortions[28].

Secondly, it is interesting to compare the equilibrium distortion under asymmetric information of the single and the multiple principal settings.

When the range of uncertainty over the "consensus parameter" is low enough ($\overline{a} < 1$) the presence of the international financial institution allows for a lower distortion in equilibrium ($\tau^*_{AAI} < \tau^*_{AI}$). The competition between the conflicting principals produces an improvement on the economic welfare. However, if uncertainty increases ($\overline{a} > 1$) this result is maintained only when the government has a great interest in the public welfare ($a > (\overline{a} - 1)$). Otherwise, foreign aid makes things worse. Observe that, while in the single principal case, the value of the consensus parameter represents the relative weight attached to the overall welfare compared to the one associated to the lobby's contribution, in the common agency setting, since the IFI shares the government's objective in terms of welfare, the implicit weight associated to the total payments hydes a welfare-prone component. When only the lobby is active an $a = 1$ means that the government gives the same weight to the economic performance of the country and to the contribution received. In the game involving the IFI, the same value of a underesteems the importance attached to the economic welfare. In this sense the case of $a < 1$ is less restrictive in this framework. However, the assumption of a major importance given to public welfare seems more reasonable, in particular since I consider the influence of only one interest group. In Table 3.1 I report the equilibrium outcomes of all the analyzed cases under this hypothesis.

The reservation utility of the government is the same, absent each of the two principals. When there is no aid, the lobby has to compensate the government from the increase in the distortion by making him as well off as without the contribution. When the lobby is not active, the IFI in equilibrium does not give any assistance, because the government already pursues a zero optimal distortion. Each principal, anyway, in order not to be

[26] By expressing the equation of the equilibrium distortion in terms of a and substituting it in the respective f.o.c.s , we can derive the marginal payments in terms of a.

[27] The level of distortion that maximizes its utility is $(\overline{Q})$.

[28] The optimal distortion of the IFI and the government coincide.

excluded from the game, has to contribute enough to leave the joint utility of the government and the other principal unchanged with respect to the case of its absence. The equilibrium payments in Table 3.1 are obtained in a similar fashion under complete and asymmetric information, but in the latter case the expected values have to be considered. This leads to the contribution depending on the upper bound of the distribution of the consensus parameter, $\overline{a}$. The results resemble the ones obtained in Chapter 2. Here anyway, I explicitely addressed conditionality, as the assistance schedule $A(\tau)$ depends on the level of distortion implemented. I individuated, though, an additional channel through which aid can potentially induce more distorted equilibria, even in the presence of conditionality. In this case, what drives to the "bad equilibrium" is the wide uncertainty over the government's preferences.

	Complete information	Asymmetric information
1 Pr.	$\tau^* = \frac{\overline{Q}}{1+a}$ (++)	$\tau^*_{AI} = \frac{\overline{Q}}{1+2a-\overline{a}}$, $a > \frac{\overline{a}-1}{2}$ (+++)
	$C(\tau^*) = a(\tau^*)^2$	$C(\tau^*_{AI}) = (\overline{a}-a)\overline{Z} + a(\tau^*_{AI})^2$
2 Pr.s	$\tau^*_A = \frac{\overline{Q}}{2+a}$ (+)	$\tau^*_{AAI} = \frac{\overline{Q}}{2+3a-2\overline{a}}$, $a > \frac{2}{3}(\overline{a}-1)$ (++++)
	$C(\tau^*_A) = (1+a)(\tau^*_A)^2$	$C(\tau^*_{AAI}) = E[(1+a)(\tau^*_{AAI})^2]$
	$A(\tau^*_A) = (1+a)({\tau^*_A}^2 - {\tau_I}^2) - 2\overline{Q}(\tau^*_A - \tau_I)$	$A(\tau^*_A) = E[(1+a)({\tau^*_{AAI}}^2 - {\tau_L}^2) - 2\overline{Q}(\tau^*_{AAI} - \tau_L)]$

Table 3.1 Equilibrium outcomes in the presence of high uncertainty over the government's preferences ($\overline{a}$>1)

5 Conclusion

It is often the case that government's preferences towards collective welfare are not common knowledge to the other agents of the economy. I analyzed how a political setting characterized by the presence of a special interest group is influenced by this kind of asymmetric information. The lobby tries to "buy" the government in order to affect its policy decisions, but it does not know to what extent the government weights public welfare with respect to the contribution offered. Asymmetric information in the internal political game leads to a larger distortion in equilibrium compared to the complete information setting when the government is highly altruistic. Only in the extreme case of a completely benevolent government (when the consensus parameter a coincides with the upper value of its distribution, $\overline{a}$) the level of distortion under complete and asymmetric information is the same. In this framework the lobby constructs a contract that associates to any level of the consensus parameter (a) a given contribution. For not enough altruistuic governments ($a < (\overline{a}-1)/2$), however, the lobby does not succeed in pushing the government to reveal its true preferences. Low levels of the consensus parameter leads to higher degrees of distortion. If positive contributions were "promised" to a "bad" government, this would have the incentive to mimic more altruistic preferences in order to obtain a larger contribution to implement the same degree of distortion it would have chosen anyway. Hence ,in order to induce the government to reveal its true preferences, low levels of the consensus parameters have to be associated to a null contribution.

The simple Principal-Agent framework is then complicated by considering the presence of an Internacional Financial Institution which gives aid to the government with a benevolent porpose. The multiple principle setting cannot be analyzed anymore by relying on the revelation principle instrument. Both the lobby and the IFI make payments to the government with opposite objectives over the degree of distortion to implement. They offer a menu of contracts to the government that is designed taking into account both the government objective function and the payoffs obtainable by the alternative decision of playing with only one principal. With complete information aid makes the policy environment better. The distortion produced in equilibrium is lower than the one implemented when only the lobby is active. Aid here is considered conditional on policies since the IFI's payment function depends on the degree of distortion. Under asymmetric information instead the equilibrium distortion is larger[29]. There is also the risk of ending up to a more distorted equilibrium with respect to the the single-principal case under asymmetric information. In particular this occurs when the uncertainty over the consensus parameter is high ($\overline{a} > 1$) and the government is not very altruistic ($a < (\overline{a} - 1)$). Otherwise the standard results of an improvement in the policy outcome due to the competition of conflicting principals still take place.

There is a variety of situations in which the preferences of the government are perceived as highly uncertain. Unstable governments, for instance, are typically less reliable. Their line of conduct is very volatile. This induces

[29] As for the single-principal case only in the extreme case of the consensus parameter being equal to the upper value of its distribution the equilibrium distortions of the complete and asymmetric information cases coincide.

difficultes in forecasting their consensus preferences. Recently elected governments, especially in the context of a regime change, might accomplish the objectives declared during their electoral campaign (or rise to the power) or might not. Along the course of the analysis I have taken the consensus parameter a as exogenous. Thinking about what factors it might depend on, government reputation and previous committments would certainly lie on top of the list.

In Montanari(2007) I analyzed the cases in which the presence of a benevolent International Financial Institution produces more distorted equilibria with respect to the one observed when the government and a domestic lobby interact. Here I extended thet setting to asymmetric information. Here I extended the setting considered in the second chapter to asymmetric information.

The analysis leads to identify an additional channel through which aid potentially induces more distorted equilibria in the recipient country' economy. Moreover, the kind of assistance I refer to is conditional aid which in Montanari (2007) allowed to induce less distorted equilibria. From an analytical point of view, aid simply sums up to public welfare inside the government's objective function. In practice, the effectiveness of foreign assistance considered in this model is limited to the aid effect on welfare through policies. I isolated the direct impact of assistance on the economic welfare of the country from its indirect effect and I considered only the latter one. The results strongly depend on the volatility of the government's preferences. This specific factor has not yet been considered in the Aid Effectiveness Literature, but it might play a role in explaining why the aid-policy interaction term of growth regressions is not significant in some specifications. These empirical studies use cross-country regressions and policy indexes. Country specific effects are generally taken into account only by means of the initial GDP of the country and regional dummy variables. Further research on the topic deserves proper attention.

6 Appendix

Here I derive the solution of the lobby's maximization problem in section 3. From the IC sufficient condition, I substitute $G_1(a)$ into the maximand obtaining

$$\max_{d(a),G_1(a)} \int_0^{\overline{a}} [-(\tau(a)-\overline{Q})^2 - G_1(0) - \int_0^a W(\tau(s))ds + a(\overline{Z}-\tau(a)^2)]\phi(a)da \quad (51)$$

Integrating by parts we get

$$\max_{d(a),G_1(a)} \int_0^{\overline{a}} \{[-(\tau(a)-\overline{Q})^2 - G_1(0) + [a - \frac{1-\Phi(a)}{\phi(a)}](\overline{Z}-\tau(a)^2)\}\phi(a)da \quad (52)$$

For the uniform distribution the hazard rate property necessary to guarantee that the concavity condition is always satisfied $(\partial[\frac{1-\Phi(a)}{\phi(a)}]/\partial a < 0)$, having $\Phi(a) = a/\overline{a}$ and $\phi(a) = 1/\overline{a}$. Observing that $G_1(0) = 0$, and optimizing pointwise leads to the following f.o.c.[30]:

$$-2(\tau(a)-\overline{Q}) - 2(2a-\overline{a})\tau(a) = 0 \quad (53)$$

that leads to the equilibrium distortion equation τ_{AI}.

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