On foreign aid effectiveness: when conditionality met ownership

Francisco Candel-Sánchez

Published online: 08 Jul 2021.

Submit your article to this journal ↗

View related articles ↗

View Crossmark data ↗

Routledge
Taylor & Francis Group

Check for updates

On foreign aid effectiveness: when conditionality met ownership

Francisco Candel-Sánchez

Departamento de Fundamentos del Análisis Económico, Facultad de Economía y Empresa, Universidad de Murcia, Murcia, Spain

ABSTRACT

In this paper, we propose a game theoretic approach to deal with the problem of implementing the efficient allocation of aid and reform through policy conditionality. We show that optimality can only be attained by a conditional scheme that takes into account the characteristics of both donor and recipient. Moreover, the levels of aid and reform induced by such a mechanism are, under certain conditions, compatible with the goals of the recipient government. This result reconciles ownership with a specific form of conditionality.

1. Introduction

An important challenge in foreign aid policy is the improvement of government ownership of structural reform programs designed by International Financial Institutions (IFIs). The emphasis placed on ownership since the end of the nineties is part of the IFI's strategies for poverty reduction, and comes as a result of the questionable success achieved in this respect by the so-called *policy conditionality*.[1] Despite successive reforms of adjustment programs, Kentikelenis, Stubbs, and King (2016) analyze IMF loan agreements during 1985–2014 and find little evidence of a fundamental transformation of IMF conditionality.

The current debate on ownership vs. conditionality can be placed in the broader context of the debate on institutions as centrally designed devices (the "top down" vision) vs. institutions as a result of the evolution of customs and traditions in a society[2] (the "bottom up" vision). Whereas policy conditionality is a top-down institution, country ownership of policy reform draws on a bottom-up approach. There is a general consensus that the principles of top-down changes should be combined with context-specific knowledge to create feasible reforms. In this sense, Molenaers, Dellepiane, and Faust (2015) argue that the new generation of Political Conditionalities requires to study in depth the bargaining processes in the aid chain, from the donors' politics to the recipients' political economy and domestic constraints. In a similar fashion, Branson and Hanna (2000, 1) suggest several ways to improve government ownership of policies by proposing "a broader view of conditionality as an evolving process in support of a policy compact based on mutual commitment". Although reasonable, their proposals

are somewhat vague and lack analytical support. This paper provides a theoretical toolkit to better understand the problem of consistency between conditionality and ownership.

Virtually all reviews of conditionality by the IMF and the World Bank in recent years conclude that enhancing ownership is critical for program success. As stated in the IMF Review of Conditionality (2011), "The Fund should continue to promote ownership as much as possible in the way it approaches program conditionality and design". In the same line, the Paris Declaration on Aid Effectiveness (OECD 2005) established that aid policy should be reformed with the goal (among others) of increasing country ownership of reforms. Inspired by these assertions, in this paper we ask how much ownership entails a conditional aid scheme, and if is it possible to design a mechanism that improves ownership of development policies with respect to traditional conditionality.

The relationship between the concepts of conditionality and ownership has been addressed in the literature from different perspectives. Khan and Sharma (2003) claim that some form of conditionality is necessary in IMF loans, since the lender must ensure that the loan will be repaid. Country ownership reveals critical for the success of aid programs since it aligns the interests of the borrower and the lender. These authors analyze proposals aimed at enhancing the degree of ownership of structural programs financed by the IMF. Bird and Willett (2004) recognize that ownership is a concept difficult to measure, and that this limits its operational value. Concessions on the design of programs should be considered to maximize the probabilities that good policies are adopted.

The topic treated in this paper is related to previous work by Marchesi, Sabani, and Dreher (2011) and Dreher, Langlotz, and Marchesi (2017). These authors identify the conditions under which it is optimal for the donor to delegate policy control to the recipient. Dreher, Langlotz, and Marchesi (2017) analyze a setting in which both donor and recipient possess different information about characteristics of the country which are relevant to the effectiveness of aid. A centralized scheme (project aid) is shown to be superior to a delegation scheme (budget support) if the donor possesses better information than the recipient, and vice versa. In a similar vein, the work by Marchesi, Sabani, and Dreher (2011) focuses on the reform of conditionality and studies the role of information transmission between a multilateral donor and a recipient country. They find that, as long as the recipient country has an informational advantage greater than that of the IMF, a delegation scheme can improve the effectiveness of aid policy with respect to a centralized scheme. Both Dreher, Langlotz, and Marchesi (2017) and Marchesi, Sabani, and Dreher (2011) consider a two-sided incomplete information environment where different information allocations lead to different policy proposals.

In contrast, in this paper we analyze the relationship between conditionality and ownership in a complete information setting. The source of inefficiency here emerges from the interaction between the order of moves of the conditional aid game and the incentives faced by the players (donor and recipient) at each stage of the game. In particular, the dynamic structure of conditional aid programs entails problems of commitment and credibility on the part of the donors. We focus our attention on the time inconsistency of conditional aid policy. The (altruistic) donors are said to fall in a Samaritan's Dilemma (Buchanan 1975) as long as they face incentives to disburse aid, even when the conditions related to structural reform have not been met. In two seminal papers, Pedersen (1996, 2001) applies the logic of the Samaritan's Dilemma to analyze the

incentives faced by aid organizations seeking to promote productive investment and growth or alleviating poverty in recipient countries: If the aid organization is altruistic and plays the role of a Stackelberg follower, recipients anticipate the donors' incentives and backtrack on structural reform. The donors' lack of credibility then implies that the equilibrium aid policy is inefficient. Recently, Molenaers, Dellepiane, and Faust (2015) have pointed out the importance of studying how credibility dilemmas reconcile with different forms of conditionality.

Our first inquiry is: How should conditionality be designed in order to achieve an efficient allocation of aid and reform? We characterize a scheme that links aid to reform in such a way that both donor and recipient face incentives to carry out socially efficient decisions. In particular, we find that the rule that associates aid to reform depends on the donor and recipient's preferences over policy outcomes (hence, it is context-specific). Moreover, this rule must be gradual and flexible. This implies, for instance, that aid should not be completely withdrawn if recipients fail to comply with the conditions. Instead, the amount of aid should be tailored to the degree of fulfillment of structural adjustment. The characteristics of our optimal rule, compared to harsh conditionality, facilitate that all parties commit to its terms.

After the identification of the characteristics of an optimal aid scheme, we analyze whether this scheme is, at least to some extent, compatible with government ownership of aid policies on the part of recipient countries. We propose a measure of the degree of government ownership of every structural reform program, an "ownership function". Using this function, we perform the exercise of comparing, in terms of government ownership, the efficient policy outcome induced by our incentive scheme with the one that emerges in equilibrium from a conditional aid scheme in which the donor lacks enforcement power. We find that our optimal rule proves to be superior to the traditional conditional scheme if and only if a specific condition holds. This condition is more likely to hold the higher (i) the recipient's concern with poverty reduction, (ii) the marginal impact of aid on poverty reduction and/or (iii) the degree of complementarity between aid and reform. A specific form of conditionality, which induces optimal aid policy, can also be more aligned with the recipient's preferences than traditional conditionality.

The paper is organized as follows. In Section 2 we describe the model. Section 3 shows the lack of effectiveness of policy conditionality caused by time inconsistency. In Section 4 we characterize an aid scheme that achieves the efficient aid policy outcome. Section 5 presents the ownership function and obtains a condition that characterizes situations where the efficient aid policy exhibits a higher degree of government ownership than the time-consistent policy. Section 6 summarizes the main conclusions of the paper. The proofs of the main results are in the Appendix.

2. Model

We propose a game theoretical model with two players: the donor country and the government in the recipient country. The donor is concerned with poverty reduction and also cares about the amount of aid donations (aid helps to reduce poverty, but it also entails budgetary costs). The recipient benefits from poverty reduction, but also faces the political costs of undertaking structural reform. Both aid and reforms contribute to reduce poverty.[3] Let $y \geq 0$ denote aid and let $z \geq 0$ represent a measure of the effort

exerted by the recipient government in structural reform. For instance, we can think of z as the World Bank's Country Policy and Institutional Assessment (CPIA).[4]

Domestic consumption in the recipient country (or poverty reduction) is given by function $c(y, z)$. We interpret this function as a technology that relates aid and reform (inputs) to poverty reduction (outcome). Collier and Dollar (2001) estimate positive values for both the marginal impact of aid on growth and the marginal impact of reform on growth (a proxy for poverty reduction). Besides, in their paper aid is shown to exhibit diminishing returns. Consistent with these empirical findings, we assume that[5] $c_y > 0$, $c_z > 0$ and $c_{yy} \leq 0$. For technical reasons, we further assume that $c_{zz} \leq 0$, $c_{yy}c_{zz} \geq c_{yz}^2$, and that c has continuous second partial derivatives at any point[6] (y, z).

The utility functions of both donor and recipient are defined, respectively, as:

$$u^D(y, z) = \theta^D c(y, z) - y, \tag{1}$$

and

$$u^R(y, z) = \theta^R c(y, z) - e(z). \tag{2}$$

Parameters $\theta^D > 0$ and $\theta^R > 0$ represent, respectively, the donor's and the recipient's concern with poverty reduction. The monetary cost of disbursing aid level y enters linearly in the donor's utility function in Equation (1). Structural reform costs are represented by function $e(z)$, with $e'(.) > 0$ and $e''(.) > 0$. The convex shape of this function indicates that reform is proportionally more costly at higher levels of reform.

The utility function of the donor is quasi-linear, with the non-linear part accounting for the donor's concern with poverty reduction. Parameter θ^D can be interpreted as the donor's degree of altruism. However, as surveyed in Dreher and Lang (2019), very often there are motives other than altruism underlying donor's aid. For instance, the donor can be motivated by commercial interests in the recipient country (Younas 2008; Berthélemy 2006), the recipient's colonial past (Alesina and Dollar 2000), or geopolitical considerations (Dreher et al. 2019). Foreign aid can also be related to votes for political favors in the UN Security Council (Kuziemko and Werker 2006), or political alignment with the donor (Kilby 2009). However, as shown in Dreher, Eichenauer, and Gehring (2018), aid that is driven by geopolitical interests does not contribute to growth. Minasyan, Nunnenkamp, and Richert (2017) consider that the effects of aid depend on the quality of donors. Here we focus on aid that contributes to poverty reduction, and hence assume a benevolent donor throughout the paper.

Governments in aid recipient countries typically face political costs of undertaking reform, the so-called status quo bias. Parameter $\theta^R > 0$ measures the relative weight the recipient places on domestic consumption with respect to the political cost of reform. Drazen (2002) analyzes the relationship between IMF conditionality and country ownership from a political economy perspective. The government wants to undertake reform, but faces political constraints on the part of domestic interest groups that oppose reform. In a similar vein, Mayer and Mourmouras (2008) consider the influence by interest groups on policy-makers leading to distorted policies. Bird and Willett (2004) argue that political economy variables must be considered when programs are negotiated. We summarize the political economy of reform in a black box function $e(.)$ that represents the government's political constraints. Even if there were no political constraints

(i.e.,$e(.) = 0$ for all z), the interests of donor and recipient would not be perfectly aligned. The reason is that parameters θ^D and θ^R are, in general, different and the donor faces budgetary cost from aid donations. So, as argued in Drazen (2002) conditionality can still be useful even in the absence of political constraints.

We assume that foreign aid is complementary to policy reform. There is consistent evidence that aid is more effective in countries with good quality policies. Using data from the World Development Indicators, Bourguignon and Sundberg (2007) shows that countries with higher CPIA grow faster. In Collier and Dollar (2001), it is shown that foreign aid enhances the poverty reduction effect of good policy and good policy increases the impact of aid on poverty reduction. In their estimations, these authors find a positive and significant coefficient that account for the interaction of aid and policy (measured through the CPIA). That is, the impact of policy change on growth depends on how much aid a country is getting. In the terms of our model, the players' actions (y and z) are strategic complements, i.e., $c_{yz} \geq 0$ and $c_{zy} \geq 0$.

The (weak) complementarity between aid and reforms allows for two alternative interpretations: either the marginal impact of reform (aid) increases with higher levels of aid (reform), that is, $c_{yz} = c_{zy} > 0$, or the marginal impact of reform (aid) is independent of the level of aid (reform), that is, $c_{yz} = c_{zy} = 0$. The first scenario accounts for a Burnside and Dollar (2000)- type benchmark, where higher levels of reform improve the effectiveness of foreign aid. The second scenario is related to other studies where no clear evidence of a positive relationship between aid and reform is found (see, for instance, Easterly, Levine, and Roodman 2004).

In order to derive the efficient levels of aid and reform, we maximize a social welfare function defined as $w(y, z) = u^R(y, z) + u^D(y, z)$. Note that the assumptions made on functions $c(.)$ and $e(.)$ imply that function $w(y, z)$ is strictly concave and $w_{yy} w_{zz} > (w_{yz})^2$. The first-order conditions of this problem are

$$c_y = \frac{1}{\theta^D + \theta^R} \qquad (3)$$

and

$$\frac{c_z}{e'(z)} = \frac{1}{\theta^D + \theta^R}. \qquad (4)$$

Note that the optimal aid policy does not coincide with the policy that minimizes poverty. The reason is that both the budgetary costs of the resources devoted to foreign aid and the recipient's costs from structural reform programs are included in our definition of social welfare. The *efficient aid policy* pair (y^*, z^*) is implicitly defined by Equations (3) and (4) above.

3. The Samaritan's Dilemma in aid policy

In this section, we describe a sequential setting in which the recipient first sets up a reform level and then the donor decides on aid disbursement. In the absence of a credible threat on the part of the donor, the recipient takes strategic advantage of its position as a *Stackelberg leader*. As a consequence, the equilibrium aid policy proves

inefficient. To mitigate the problem of time inconsistency, Svensson (2000) advocates for tied project aid as the most appropriate modality of aid. However, the view of the IFIs is that budget support strengthens country ownership of reform policy (Koeberle et al. 2005; OECD 2005).

A branch of the literature on development is devoted to study which modality of aid, budget support or project aid, is preferable to enhance aid effectiveness. Cordella and Dell'Ariccia (2007) consider that project aid is superior to budget support if recipient governments are relatively less socially committed or if aid programs are relatively large with respect to the country's own resources. Jelovac and Vandeninden (2014) show that budget support is always superior to project aid regardless of the degree of policy conditionality. Dreher, Langlotz, and Marchesi (2017) and Marchesi, Sabani, and Dreher (2011) identify ownership with a delegation scheme, where the recipient country takes control of aid policy, while project aid is seen as a centralized scheme. Since we focus our attention on the characteristics a policy mechanism must fulfill to be successful in terms of ownership, the modality of aid that fits best with our normative proposal is that of budget support.

Time inconsistency of conditional aid can be attributed to low opportunity cost of disbursed funds, pressure to lend, political economy factors within the aid agency or donor's altruism. In all these cases, the donor faces incentives to disburse positive amounts of aid even if the recipient backtracks on reforms. In the language of game theory, aid denial is a non-credible threat since it goes against the donor's interests. The works of Coate (1995), Federico (2004), Hagen (2006), Kanbur (2000), Pedersen (1996, 2001), or Svensson (2000, 2003) have focused on a Samaritan's Dilemma inefficiency that drives to poor development outcomes. In this respect, Kanbur (2000) attests to this situation in relation to the 1992 adjustment program for Ghana: "*In fact, as the representative of the World Bank on the ground, I came under pressure from several sources, some of them quite surprising, to release the tranche with minimal attention to conditionality . . . ".* The process follows the logic of a *Samaritan's Dilemma*: The recipient is aware of the donor's altruistic motivation and manipulates the donor's best response to its own benefit.[7] As a result, the conditional scheme suffers from time inconsistency.

Next, we analyze formally how the non-enforceability of a conditional aid scheme leads to inefficiently low reform level and aid disbursement. An aid program consists of a set of conditions on structural reform $(\hat{z})$ related to a given amount of aid funds $(\hat{y})$. First, the recipient undertakes a certain level of reform z. Then, after observing z, the donor makes a disbursement decision y. With this sequence of events, regardless of the amount of aid initially committed $\hat{y}$, the donor's best response is to disburse aid level $y(z) = argmax_{\{y\}} u^D(y, z)$. The recipient anticipates the donor's best response function $y(z)$ and then sets up z so as to maximize $u^R(y(z), z)$.

Let the policy pair (y^{tc}, z^{tc}) be the Subgame Perfect Equilibrium (SPE) of the sequential game induced by the conditional scheme described above. The equilibrium disbursement is $y^{tc} = y(z^{tc})$. The pair (y^{tc}, z^{tc}) is the solution of the equations system:

$$c_y = \frac{1}{\theta^D}, \tag{5}$$

$$\frac{c_z + c_y y'(z)}{e'(z)} = \frac{1}{\theta^R}, \tag{6}$$

where $y'(z)$ represents the *donor's responsiveness* to reform. Implicit derivation in Equation (5) allows us to write $y'(z) = -\frac{c_{yz}}{c_{yy}} \geq 0$. Note that the responsiveness of aid to reform is affected by the degree of complementarity between aid and reform. We establish in the next proposition that the SPE (time-consistent) policy package (y^{tc}, z^{tc}) is, in general, inefficient.

Proposition 1: *In the absence of donor's commitment power, the time-consistent conditional aid policy scheme (y^{tc}, z^{tc}) is such that: (i) $z^{tc} < z^*$ if $\frac{y'(z)}{e'(z)}$ is small enough; and (ii) $y^{tc} < y^*$.*

Proof: See Appendix.

The above result tells us that the optimal aid policy (y^*, z^*) cannot be achieved through a conditional scheme in which the donor lacks credibility. This prediction is confirmed by the empirical evidence regarding the recipient's compliance rates (see, for instance, Mosley, Harrigan, and Toye 1995, or Killick, Gunatilaka, and Marr 1998). The equilibrium (time-consistent) level of reform turns out to be inefficiently low as long as the quotient $\frac{y'(z)}{e'(z)}$ is not too high. The factors underlying the inefficiently low reform level are: (i) domestic political constraints (in the form of high marginal cost of reform) and (ii) low degree of complementarity between aid and reform (i.e., low value of the derivative c_{yz}).

One possible way to enhance the donor's credibility is delegation of aid policy to a third party with the ability to enforce the conditions. In fact, bilateral donors transfer part of their aid budget to multilateral aid agencies for implementation of aid policies. The IMF and the World Bank have been accused of giving preferential treatment to recipients based on geopolitical considerations.[8] It must be said, though, that bilateral donors are not immune to this criticism either. Dreher et al. (2019) show that China's development projects in Africa are allocated to politically privileged regions, and they do not observe such a pattern of favoritism in World Bank development projects. The IFIs are also blamed for poor performance of their financed projects (Dreher et al. 2013; Kilby 2013, 2015). Nevertheless, considering the period 1970–2001, Headey (2008) shows that multilateral aid has been historically more effective than bilateral aid. In the same line, Milner and Tingley (2013) present evidence that multilateral aid is more efficient than bilateral aid, and Milner (2006) argues that using a multilateral agency to send aid is a credible signal to voters of the donor country about the way foreign aid is used. In a similar fashion, Findley, Milner, and Nielson (2017) consider that multilateral aid is more transparent than bilateral aid.

While international aid agencies are not free from credibility problems, there are reasons to believe that their enforcement power is stronger than that of bilateral donors. As argued by Rodrik (1995), the interaction of recipient governments with multilateral agencies can remain less politicized than with bilateral donors. In this respect, donors sometimes resort to the practice of *cross conditionality*. That is, donors condition the

release of aid on a country meeting the conditions established by the IMF or World Bank programs (Dijkstra 2002; Koeberle et al. 2005). Consider, for instance, the Norwegian-Tanzanian aid relationship reported in Selbervik (1999): Norway (the donor) applies "cross-conditionality" towards Tanzania (the recipient), "which means that Norwegian bilateral aid has been conditional on Tanzania reaching agreements with the IMF and the World Bank". There are many other examples of the use of cross conditionality.[9]

4. An optimal conditional aid rule

In this section, we propose a conditional scheme that manages to implement the efficient policy characterized in Equations (3) and (4). The conditional aid rule, together with the order in which the participants make decisions, defines a sequential game. From a theoretical point of view, we are designing the rules of a game that yields the efficient aid policy as an equilibrium outcome.

We define a conditional aid rule as a function $y^C: \mathbb{R}^+ \to \mathbb{R}^+$ that associates each level of reform with one value for aid donation. Recipients take into account that aid disbursements are determined by function $y^C(z)$. The stages of the game are:

Stage 1: The aid agency (the planner) sets up the policy scheme $y^C(z)$.

Stage 2: The recipient country makes a decision on z.

Stage 3: The donor country disburses aid according to the rule $y = y^C(z)$.

Our approach implicitly entails ex-post conditionality, provided that the transfer in Stage 3 is made in exchange for completed reform actions or reform outcomes. We now look for a Subgame Perfect Equilibrium (SPE) of the game jointly defined by the utilities in Equations (1) and (2), the timing of events just described, and the conditional aid policy rule $y^C(z)$. We solve the game by backwards induction. In Stage 2, the recipient sets z so as to maximize $u^R(y, z)$ subject to $y = y^C(z)$. We write this problem as

$$Max_{\{z\}} \theta^R c(y^C(z), z) - e(z). \tag{7}$$

The first-order condition of this problem is given by

$$\theta^R \left[c_y y'^C(z) + c_z \right] = e'(z). \tag{8}$$

The left-hand side of condition (8) is the marginal benefit of increasing z, that includes both the direct effect of z on poverty reduction and the indirect effect of z on the amount of aid disbursed. The right-hand side of condition (8) is the marginal cost of increasing z. Condition (8) implicitly defines a value for z (let us call it $z^{max}(\theta^D, \theta^R)$) that maximizes the recipient's utility given the conditional rule $y^C(z)$. In Stage 1, the aid agency takes into account condition (8) in order to devise the optimal scheme $y^C(z)$, i.e., the scheme such that $z^{max}(\theta^D, \theta^R) = z^*$ and $y^C(z^*) = y^*$. The next proposition characterizes the rule $y^C(z)$ that induces the optimal policy (y^*, z^*).

Proposition 2: *The conditional aid rule $y^C(z)$ that induces the pair (y^*, z^*) as an equilibrium outcome of conditional aid policy is such that:*

$$y'^C(z) = \left(\frac{\theta^D}{\theta^R}\right) \frac{c_z(y^C(z), z)}{c_y(y^C(z), z)}, \tag{9}$$

and

$$y^C(z^*) = y^*. \tag{10}$$

Proof: See Appendix.

Observe that, under Condition (9), Equation (8) turns out to be equivalent to Equation (4). However, Condition (9) is a differential equation, whose solution is given by a family of functions $y^C(z)$. Condition (10) allows reducing this family to a single function. Thus, Conditions (9) and (10) together imply that the optimal choice of the recipient government is z^* and that the amount of aid disbursed is y^*.

The most appropriate way to frame the result of Proposition 2 is as normative policy analysis: if we were able to design IFI conditionality without political constraints, how should we do it? The design of the rule is important here because there is imperfect control of the implementation of reform policies. The rule $y^C(z)$, implicit in Equations (9) and (10), provides the right incentives for recipients to carry out reform. Observe that Condition (9) implies positive responsiveness of function $y^C(z)$ to changes in z, provided that $c_z > 0$ and $c_y > 0$. Function $y^C(z)$ is substantially different from function $y(z)$, whose slope is only determined by the shape of the poverty reduction function $\left(y'(z) = -\frac{c_{yz}}{c_{yy}} \geq 0\right)$. The degree of responsiveness of $y^C(z)$ (its slope) depends on the quotient θ^D/θ^R. Therefore, the optimal aid rule must be necessarily tailored to the preferences of both donor and recipient. From a theoretical viewpoint, this result proves that the one-size-fits-all approach to conditionality cannot achieve optimality.

The proposed rule provides certain flexibility that allows the recipient to adapt to specific situations and thus make conditionality more credible. In particular, the incentive scheme includes a continuous response to reform. This means that, if the conditions required to qualify for aid are not fully met, some amount of aid will still be disbursed. The flexibility and gradualism implicit in the proposed rule is in line with the World Bank's view of conditionality: "Rather than using conditionality as a 'stick,' donors have come to view conditionality as a set of milestones to be agreed between themselves and the partner government" (Koeberle et al. 2005). In the same line, Branson and Hanna (2000, 1) assert that "conditionality could support floating tranches, as in Higher Impact Adjustment Lending (HIAL), with the government choosing the sequence and timing of sector reforms as external support is calibrated to the quality of the program".

The conditional scheme proposed here provides the right incentives and at the same time allows the recipient to adjust to a gradual pace of reform. However, the strongest argument in favor of our scheme is that, under certain circumstances, the equilibrium outcome induced by the mechanism entails a higher degree of ownership than the outcome from a traditional conditional aid scheme. We investigate this issue in the next section.

5. Ownership and its relationship with conditionality

In this section, we establish a relationship between the recipient's ownership of aid policy and the optimal conditional scheme of the previous section. The IMF defines national ownership as: "A commitment to a program of policies, by country officials who have the responsibility to formulate and carry out those policies, based on an understanding that the program is achievable and it is in the country's best interest" (IMF 2002). Drazen (2002, 37) defines ownership as "the extent to which a country is interested in pursuing reforms independently of any incentives provided by multilateral lenders". Unlike Drazen (2002), we consider that the degree of ownership associated to a reform package cannot be unlinked from the amount of aid of the program. The reason is that, as long as aid and reform are complementary, the government's most preferred reform level depends on the financing of the program. Thus, the gap between the reform level in the program and the one preferred by the government depends on the donations of aid stipulated in the program. We think about the degree of ownership of reform package $(\hat{y}, \hat{z})$ as the extent to which the recipient considers that the policy pair $(\hat{y}, \hat{z})$ is coincident with its own objectives.

Next, we seek to estimate the degree of government ownership of the equilibrium outcome derived from the mechanism studied in the previous section. For this purpose, the first step is to provide an accurate measure of the degree of ownership of any given aid program. Although ownership cannot be directly observed, it can be indirectly assessed through the degree of program completion. Intuitively, then, ownership must be related to the distance between the country's most preferred level of reform (z^{ow}) and the reform level stipulated in the program, $\hat{z}$. We define the degree of ownership of aid program $(\hat{y}, \hat{z})$ as:

$$OW(\hat{y}, \hat{z}) = \frac{|\hat{z}, z^{ow}(\hat{y})|}{\hat{z}}, \tag{11}$$

where $|\hat{z}, z^{ow}|$ is a measure of the distance between the reform level included in the aid program, $\hat{z}$, and the government's optimal reform level z^{ow} given aid $\hat{y}$. We are interested in the case where $\hat{z} > z^{ow}$. Then, we can rewrite the function OW simply as: $OW(\hat{y}, \hat{z}) = \frac{\hat{z} - z^{ow}(\hat{y})}{\hat{z}} = 1 - \frac{z^{ow}(\hat{y})}{\hat{z}}$. Notice that, the closer is z^{ow} to $\hat{z}$, the closer is $OW(\hat{y}, \hat{z})$ to zero. That is, a lower value of OW means a higher degree of government ownership of program $(\hat{y}, \hat{z})$. For instance, $Ow = 0$ means that the reform level desired by the government is exactly equal to the reform level stipulated in the program.

Function $z^{ow}(y)$ represents the reform level that maximizes the recipient government's utility, given aid spending y. This function is defined as

$$z^{ow}(y) = argmax_{\{z\}} \theta^R c(y, z) - e(z), \tag{12}$$

and it is characterized by the following first-order condition

$$\theta^R c_z(y, z^{ow}) - e'(z^{ow}) = 0. \tag{13}$$

The government's optimal reform level is increasing in y because higher aid makes any given level of reform more effective in terms of poverty reduction. Then, the complementarity between aid and reform facilitates government ownership of an aid program.

Next, we show that, in certain circumstances, the efficient aid scheme leading to (y^*, z^*) dominates in terms of government ownership the conditional policy that yields as an equilibrium outcome the policy pair (y^{tc}, z^{tc}). This result is not particularly intuitive. In principle, recipient governments enjoy a higher degree of discretion in a bilateral relationship with the donor than when they commit to the rules of a mechanism with a multilateral aid agency. This would lead us to believe that a scenario in which the punishment in case of non-compliance of the conditions is not credible favors the emergence of policy outcomes that entail higher degree of government ownership. However, we claim that there exist reasonably general circumstances under which this is not the case.

Proposition 3: *The degree of government ownership of the socially optimal aid policy pair (y^*, z^*) is higher than the degree of ownership of the time-consistent pair (y^{tc}, z^{tc}) if and only if*:

$$\theta^R c_y(y^{tc}, z^{tc}) y'(z^{tc}) > \theta^D c_z(y^{tc}, z^{tc}). \tag{14}$$

Proof: See Appendix.

Let us examine Condition (14). The left-hand side of the inequality is the induced marginal impact of reform on poverty reduction for the recipient. The right-hand side is the marginal impact of reform on poverty reduction for the donor. Condition (14) tells us that, if the marginal effect on poverty reduction of an increase in reform for the recipient is stronger than this impact for the donor, then the efficient aid policy has a higher degree of government ownership than the time-consistent conditional policy. Hence, the optimal conditional aid mechanism is more likely to be successful the higher: (i) The recipient's valuation of poverty reduction, θ^R; (ii) the degree of complementarity between aid and reform, c_{yz}; and (iii) the marginal impact of aid on poverty reduction, c_y. In other words, if condition (14) holds, reform level z^* is closer to $z^{ow}(y^*)$ than z^{tc} is to $z^{ow}(y^{tc})$. This means that the recipient prefers to stick to the conditions of aid rule $y^c(z)$ rather than being the leader in an aid game where the donor is moving last.

Next, we put forward an example that illustrates how to design an optimal conditional scheme and how to compute its degree of ownership. Let us consider a Cobb–Douglas poverty reduction function $c(y, z) = y^{1-\alpha} z^\alpha$ with $\alpha \in (0, 1)$, and quadratic reform cost $e(z) = \frac{1}{2} z^2$. The optimal rule for aid donations, derived from Equations (9) and (10), in this example is given by power function $y^C(z) = \varphi z^\delta$ (where $\delta = \left(\frac{\alpha}{1-\alpha}\right) \frac{\theta^D}{\theta^R}$ and φ is a complex expression of parameters). With respect to ownership, we find that $OW(y^*, z^*) < OW(y^{tc}, z^{tc})$ if and only if $\theta^R(1 - \alpha) > \theta^D \alpha$, which is Condition (14) particularized to the specific functions of the example. Observe that this condition holds when $\delta = \left(\frac{\alpha}{1-\alpha}\right) \frac{\theta^D}{\theta^R} < 1$, that is, when $y^C(z)$, is strictly concave.

The aid rule implicit in the conditions of Proposition 2 embeds some principles generally invoked by the IFIs to enhance country ownership of policies and streamline conditionality. These principles are *selectivity, partnership* and *gradualism*. By Condition (14) we know that it is more likely that recipients accept conditionality the higher is θ^R. Our approach then provides support for the idea that aid should be given to countries

with good policy environments and commitment to a viable development strategy (Koeberle et al. 2005; OECD 2005; Khan and Sharma 2003; Svensson 2003, among others). This result is also in line with Montinola (2010), who argues that the efficacy of conditional aid depends on recipient countries' level of democracy (which can be seen as a variable positively related to θ^R). In the same fashion, the empirical study by Dollar and Svensson (2000) shows that the probability of success of conditionality is higher in democracies.

Second, the design of an optimal program must be worked out cooperatively between the recipient country, the donor and the aid agency. On the one hand, the recipient government has better knowledge than the donor of the economic sectors and regions where aid is most effective. On the other hand, the donor has complementary knowledge about what has worked in other countries, and what has not. For this reason, donors and recipients should truthfully communicate and cooperate in reforms design as well as reform implementation. The aid rule $y^c(z)$, characterized in Proposition 2, depends on the preferences of both donor and recipient. This means that, for this rule to be properly designed, some kind of *partnership* is required between donor and recipient.

Third, in our mechanism, countries are offered some sort of policy options menu, since the optimal rule associates each level of reform with a certain amount of aid. This is in line with Khan and Sharma (2001, 18), who claim that: "Ownership is achieved through the country being able to make specific choices, rather than accepting a single option prepared by the IMF". Moreover, the optimal rule must be continuous in reform. The idea of a flexible relationship between aid and reform has been put forward in the World Bank's assessment of conditionality (Koeberle et al. 2005, 8): "The tension between conditionality and ownership can be addressed in part by expecting borrowing countries to follow some minimum standards on fundamental policies to gain access to financing from donors, leaving space for any additional country-grown policies beyond those minimum standards".

8. Conclusions

This paper aims to contribute to the debate on the reform of conditionality. We propose a specific form of conditionality that can be compatible with government ownership of reform programs. We use a highly stylized model to account for the Samaritan's Dilemma incentives inherent in any non-enforceable conditional aid scheme. After that, we propose a conditional aid rule that successfully implements the socially optimal allocation of aid and reform. The specific shape of this rule is shown to depend on the preferences of both donor and recipient and also on the technology that links aid and reform to poverty reduction. Next, we investigate how can this rule be aligned with the policy goals of the recipient government. For this purpose, we assess the degree of ownership of the optimal aid policy and compare it to the degree of ownership of a traditional, non-enforceable, conditional aid scheme. If a certain condition holds, the optimal aid policy entails higher government ownership than the time-consistent outcome from conditionality. Our contribution provides theoretical support to some general principles underlying the reform of conditionality, like selectivity of countries with

favorable policy environment, partnership in the design of aid policy, or gradual implementation of conditionality.

Notes

1. Dreher (2009) and Bird (2008) survey theoretical arguments in favor and against policy conditionality. Empirical studies of conditionality include Beazer and Woo (2016), Devarajan, Dollar, and Holmgren (2001), Dreher (2009), Kentikelenis, Stubbs, and King (2016), Killick (1997), Mosley, Harrigan, and Toye (1995) and Stubbs et al. (2020), among others. Some reasons for the failure of conditionality are: (i) aid donations respond to commercial interests of donors (Alesina and Dollar 2000; Kanbur 2000); (ii) the low opportunity costs of committed funds due to the budget-pressure problem (Svensson 2003); (iii) aid donations are fungible and imperfectly monitored (Cordella and Dell'Ariccia 2002); (iv) it is difficult to enforce the conditions if such conditions put debt repayment at risk (Ramcharan 2003); or, (v) a long relationship between borrower and the IMF positively influences the donor's desire to disburse funds (Marchesi and Sabani 2007).
2. See Easterly (2008).
3. For a meta study on the effectiveness of aid, see Doucouliagos and Paldam (2009). Gupta, Schena, and Yousefi (2020) analyze IMF conditions during the period 1992–2016, and find that structural conditionality is the one that obtains lasting benefits.
4. "The World Bank's Country Policy and Institutional Assessment (CPIA) assess the conduciveness of a country's policy and institutional framework to poverty reduction, sustainable growth, and the effective use of development assistance".
5. Subscripts denote partial derivatives.
6. This implies, by Schwarz' theorem, the symmetry of second derivatives, i.e., $c_{yz} = c_{zy}$.
7. There could be other reasons why recipients do not comply with the conditions. Arpac, Bird, and Mandilaras (2008), Bird (2008), or Bird (1998) identify political and institutional factors that affect the implementation of conditionality.
8. For empirical evidence on IMFs preferential treatment, see Dreher and Jensen (2007), Dreher, Sturm, and Vreeland (2009a) or the survey in Dreher and Lang (2019). With respect to the World Bank, see Dreher, Sturm, and Vreeland (2009b), Kaja and Werker (2010) or Kilby (2009).
9. See Griffith-Jones and Rodriguez (1992), for a description of the characteristics of cross conditionality in Argentina, Chile, Costa Rica, Jamaica, Mexico and Tanzania.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

References

Alesina, A., and D. Dollar. 2000. "Who gives foreign aid to whom and why?" *Journal of Economic Growth* 5: 33–63. doi:10.1023/A:1009874203400.

Arpac, O., G. Bird, and A. Mandilaras. 2008. "Stop interrupting: An empirical analysis of the implementation of IMF programs." *World Development* 36 (9): 1493–1513. doi:10.1016/j.worlddev.2007.09.001.

Beazer, Q. H., and B. Woo. 2016. "IMF conditionality, government partisanship, and the progress of economic reforms." *American Journal of Political Science* 60 (2): 304–321. doi:10.1111/ajps.12200.

Berthélemy, J. C. 2006. "Bilateral donors' interest vs. recipients' development motives in aid allocation: Do all donors behave the same?" *Review of Development Economics* 10 (2): 179–194.

Bird, G. 1998. "The effectiveness of conditionality and the political economy of policy reform: Is it simply a matter of political will?" *The Journal of Policy Reform* 2 (1): 89–113. doi:10.1080/13841289808523375.

Bird, G. 2008. "The implementation of IMF programs: A conceptual framework." *The Review of International Organizations* 3: 41–64. doi:10.1007/s11558-007-9011-4.

Bird, G., and T. D. Willett. 2004. "IMF conditionality, implementation and the new political economy of ownership." *Comparative Economic Studies* 46 (3): 423–450. doi:10.1057/palgrave.ces.8100060.

Bourguignon, F., and M. Sundberg. 2007. "Aid effectiveness–opening the black box." *American Economic Review* 97 (2): 316–321. doi:10.1257/aer.97.2.316.

Branson, W., and N. Hanna. 2000. "Ownership and conditionality." OED Working Paper Series No. 8. World Bank.

Buchanan, J. M. 1975. "The Samaritan's Dilemma." In *Altruism, morality and economic theory*, edited by E. S. Phelps, 71–85. New York: Russell Sage Foundation.

Burnside, C., and D. Dollar. 2000. "Aid, Policies and Growth." *American Economic Review* 90: 847–868. doi:10.1257/aer.90.4.847.

Coate, S. 1995. "Altruism, the Samaritan's dilemma, and government transfer policy." *American Economic Review* 85: 46–57.

Collier, P., and D. Dollar. 2001. "Can the world cut poverty in half? How policy reform and effective aid can meet international development goals." *World Development* 29: 1787–1802. doi:10.1016/S0305-750X(01)00076-6.

Cordella, T., and G. Dell'Ariccia. 2002. "Limits of conditionality in poverty reduction programs." *IMF Economic Review* 49: 68–86.

Cordella, T., and G. Dell'Ariccia. 2007. "Budget support versus project aid: A theoretical appraisal." *The Economic Journal* 117 (523): 1260–1279. doi:10.1111/j.1468-0297.2007.02082.x.

Devarajan, S., D. Dollar, and T. Holmgren. 2001. *Aid and Reform in Africa*. Washington DC: World Bank.

Dijkstra, A. G. 2002. "The effectiveness of policy conditionality: Eight country experiences." *Development and Change* 33: 307–334. doi:10.1111/1467-7660.00256.

Dollar, D., and J. Svensson. 2000. "What explains the success or failure of structural adjustment programmes?" *The Economic Journal* 110: 894–917. doi:10.1111/1468-0297.00569.

Doucouliagos, H., and M. Paldam. 2009. "The aid effectiveness literature: The sad results of 40 years of research." *Journal of Economic Surveys* 23 (3): 433–461. doi:10.1111/j.1467-6419.2008.00568.x.

Drazen, A. 2002. "Conditionality and ownership in IMF lending: A political economy approach." IMF Staff Papers, 36-67.

Dreher, A. 2009. "IMF conditionality: Theory and evidence." *Public Choice* 141 (1–2): 233–267. doi:10.1007/s11127-009-9486-z.

Dreher, A., and V. F. Lang. 2019. "The Political Economy of International Organizations." In *The Oxford Handbook of Public Choice*, edited by R. Congleton, B. Grofman, and S. Voigt. forthcoming. Oxford University Press. Oxford.

Dreher, A., A. Fuchs, R. Hodler, B. C. Parks, P. A. Raschky, and M. J. Tierney. 2019. "African leaders and the geography of China's foreign assistance." *Journal of Development Economics* 140: 44–71. doi:10.1016/j.jdeveco.2019.04.003.

Dreher, A., J.-E. Sturm, and J. R. Vreeland. 2009a. "Global Horse Trading: IMF loans for votes in the United Nations Security Council." *European Economic Review* 53: 742–757. doi:10.1016/j.euroecorev.2009.03.002.

Dreher, A., J.-E. Sturm, and J. R. Vreeland. 2009b. "Development Aid and International Politics: Does membership on the UN Security Council influence World Bank decisions?" *Journal of Development Economics* 88: 1–18. doi:10.1016/j.jdeveco.2008.02.003.

Dreher, A., and N. M. Jensen. 2007. "Independent actor or agent? An empirical analysis of the impact of US interests on International Monetary Fund conditions." *The Journal of Law and Economics* 50: 105–124. doi:10.1086/508311.

Dreher, A., S. Klasen, J. Vreeland, and E. Werker. 2013. "The costs of favoritism: Is politically-driven aid less effective?" *Economic Development and Cultural Change* 62: 157–191. doi:10.1086/671711.

Dreher, A., S. Langlotz, and S. Marchesi. 2017. "Information transmission and ownership consolidation in aid programs." *Economic Inquiry* 55: 1671–1688. doi:10.1111/ecin.12450.

Dreher, A., V. Eichenauer, and K. Gehring. 2018. "Geopolitics, Aid and Growth: The Impact of UN Security Council Membership on the Effectiveness of Aid." *World Bank Economic Review* 32: 268–286.

Easterly, W. 2008. "Institutions: Top down or bottom up?" *American Economic Review* 98: 95–99. doi:10.1257/aer.98.2.95.

Easterly, W., R. Levine, and D. Roodman. 2004. "Aid, Policies and Growth: Comment." *American Economic Review* 94: 774–780. doi:10.1257/0002828041464560.

Federico, G. 2004. "Aid and policies under weak donor conditionality." *Journal of African Economies* 13: 395–416. doi:10.1093/jae/ejh028.

Findley, M. G., H. V. Milner, and D. L. Nielson. 2017. "The choice among aid donors: The effects of multilateral vs. bilateral aid on recipient behavioral support." *The Review of International Organizations* 12 (2): 307–334. doi:10.1007/s11558-017-9275-2.

Griffith-Jones, S., and E. Rodriguez, Eds. 1992. *Cross-conditionality banking regulation and Third-World debt.* Palgrave Macmillan. London. Springer.

Gupta, S., M. Schena, and S. R. Yousefi. 2020. "Revisiting IMF expenditure conditionality." *Applied Economics* 52 (58): 6338–6359. doi:10.1080/00036846.2020.1790494.

Hagen, R. J. 2006. "Samaritan agents? On the strategic delegation of aid policy." *Journal of Development Economics* 79: 249–263. doi:10.1016/j.jdeveco.2004.11.009.

Headey, D. 2008. "Geopolitics and the effect of foreign aid on economic growth: 1970–2001." *Journal of International Development* 20 (2): 161–180. doi:10.1002/jid.1395.

IMF. 2002. *Guidelines on Conditionality.* Washington DC: IMF.

Jelovac, I., and F. Vandeninden. 2014. "How should donors give foreign aid? A theoretical comparison of aid modalities." *The European Journal of Development Research* 26 (5): 886–904. doi:10.1057/ejdr.2014.14.

Kaja, A., and E. Werker. 2010. "Corporate Misgovernance at the World Bank and the Dilemma of Global Governance." *The World Bank Economic Review* 24: 171–198. doi:10.1093/wber/lhq006.

Kanbur, R. 2000. "Aid, conditionality and debt in Africa." In *Foreign aid and development: Lessons learnt and directions for the future*, edited by F. Tarp, 409–422. Routledge. London.

Kentikelenis, A., T. Stubbs, and L. King. 2016. "IMF conditionality and development policy space, 1985–2014." *Review of International Political Economy* 23 (4): 543–582. doi:10.1080/09692290.2016.1174953.

Khan, M. M. S., and M. S. Sharma 2001. "IMF conditionality and country ownership of programs." No. 1-142. International Monetary Fund.

Khan, M. S., and S. Sharma. 2003. "IMF conditionality and country ownership of adjustment programs." *The World Bank Research Observer* 18 (2): 227–248. doi:10.1093/wbro/lkg007.

Kilby, C. 2009. "The political economy of conditionality: An empirical analysis of World Bank loan disbursements." *Journal of Development Economics* 89 (1): 51–61. doi:10.1016/j.jdeveco.2008.06.014.

Kilby, C. 2013. "The political economy of project preparation: An empirical analysis of World Bank projects." *Journal of Development Economics* 105: 211–225. doi:10.1016/j.jdeveco.2013.07.011.

Kilby, C. 2015. "Assessing the impact of World Bank preparation on project outcomes." *Journal of Development Economics* 115: 111–123. doi:10.1016/j.jdeveco.2015.02.005.

Killick, T. 1997. "Principals, agents and the failings of conditionality." *Journal of International Development* 9: 483–495. doi:10.1002/(SICI)1099-1328(199706)9:4<483::AID-JID458>3.0.CO;2-S.

Killick, T., R. Gunatilaka, and A. Marr. 1998. *Aid and the Political Economy of Policy Change*. Routledge. London.

Koeberle, S., H. Bedoya, P. Silarszky, and G. Verheyen. 2005. *Conditionality Revisited: Concepts, Experiences and Lessons*. Washington, DC: World Bank.

Kuziemko, I., and E. Werker. 2006. "How much is a Seat on the Security Council Worth? Foreign Aid and Bribery at the United Nations." *Journal of Political Economy* 114: 905–930. doi:10.1086/507155.

Marchesi, S., and L. Sabani. 2007. "IMF concern for reputation and conditional lending failure: Theory and empirics." *Journal of Development Economics* 84: 640–666. doi:10.1016/j.jdeveco.2007.01.001.

Marchesi, S., L. Sabani, and A. Dreher. 2011. "Read my lips: The role of information transmission in multilateral reform design." *Journal of International Economics* 84: 86–98. doi:10.1016/j.jinteco.2010.11.008.

Mayer, W., and A. Mourmouras. 2008. "IMF conditionality: An approach based on the theory of special interest politics." *The Review of International Organizations* 3 (2): 105–121. doi:10.1007/s11558-007-9023-0.

Milner, H. V. 2006. "Why multilateralism? Foreign aid and domestic principal-agent problems." *Delegation and agency in international organizations* 107: 107–139.

Milner, H. V., and D. Tingley. 2013. "The choice for multilateralism: Foreign aid and American foreign policy." *The Review of International Organizations* 8 (3): 313–341. doi:10.1007/s11558-012-9153-x.

Minasyan, A., P. Nunnenkamp, and K. Richert. 2017. "Does aid effectiveness depend on the quality of donors?" *World Development* 100: 16–30. doi:10.1016/j.worlddev.2017.07.023.

Molenaers, N., S. Dellepiane, and J. Faust. 2015. "Political conditionality and foreign aid." *World Development* 75: 2–12. doi:10.1016/j.worlddev.2015.04.001.

Montinola, G. R. 2010. "When does aid conditionality work?" *Studies in Comparative International Development* 45: 358–382. doi:10.1007/s12116-010-9068-6.

Mosley, P., J. Harrigan, and J. Toye. 1995. *Aid and Power: The World Bank and Policy-based Lending: Vol. 1, Analysis and Policy Proposals*. Routledge. London.

OECD. 2005. "The Paris Declaration on Aid Effectiveness and the Accra Agenda for Action." www.oecd.org/dataoecd/11/41/34428351.pdf

Pedersen, K. R. 1996. "Aid, investment and incentives." *The Scandinavian Journal of Economics* 98: 423–437. doi:10.2307/3440735.

Pedersen, K. R. 2001. "The Samaritan's dilemma and the effectiveness of development aid." *International Tax and Public Finance* 8 (5): 693–703. doi:10.1023/A:1012839126094.

Ramcharan, M. R. 2003. "Reputation, debt, and policy conditionality." No. 3-192. International Monetary Fund.

Rodrik, D. 1995. "Why is there multilateral lending?" No. w5160. National Bureau of Economic Research.

Selbervik, H. 1999. "Aid and conditionality. The role of the bilateral donor: A case study of Norwegian-Tanzanian aid relationship." Evaluation Report-Utenriksdepartementet (Norway).

Stubbs, T., B. Reinsberg, A. Kentikelenis, and L. King. 2020. "How to evaluate the effects of IMF conditionality." *The Review of International Organizations* 15 (1): 29–73. doi:10.1007/s11558-018-9332-5.

Svensson, J. 2000. "When is foreign aid policy credible? Aid dependence and conditionality." *Journal of Development Economics* 61: 61–84. doi:10.1016/S0304-3878(99)00061-9.

Svensson, J. 2003. "Why conditional aid does not work and what can be done about it?" *Journal of Development Economics* 70: 381–402. doi:10.1016/S0304-3878(02)00102-5.

Younas, J. 2008. "Motivation for bilateral aid allocation: Altruism or trade benefits." *European Journal of Political Economy* 24: 661–674. doi:10.1016/j.ejpoleco.2008.05.003.

Appendix

Proof of Proposition 1:

We compare Equations (3) and (4) with Equations (5) and (6). Note that $\frac{1}{\theta^D+\theta^R} < \frac{1}{\theta^D}$, $\frac{1}{\theta^D+\theta^R} < \frac{1}{\theta^R}$, and the term $\frac{c_y y'(z)}{e'(z)}$ appearing in Equation (6) is non-negative. Consider the expressions $c_y(y,z) = A$ and $\frac{c_z(y,z)}{e'(z)} + C = B$, where A, B and C represent arbitrary non-negative variables. We totally differentiate these expressions to obtain: (a) $c_{yy}dy + c_{yz}dz = dA$, and (b) $c_{zy}\frac{1}{e'(z)}dy + \frac{c_{zz}e'(z)-e''(z)c_z}{(e'(z))^2}dz + dC = dB$. In order to show that $y^{tc} < y^*$ and $z^{tc} < z^*$ we just need to prove that $dA > 0$, $dB > 0$ and $dC \geq 0$ imply $dy < 0$ and $dz < 0$. We proceed by contradiction. Suppose that $dA > 0$, $dB > 0$ and $dC \geq 0$, and either (i) $dy > 0$ and $dz < 0$, or (ii) $dy < 0$ and $dz > 0$, or (iii) $dy > 0$ and $dz > 0$. Given our assumptions on function $c(.)$, in case (i), there is a contradiction with expression (a). In case (ii) there is a contradiction with expression (b) as long as dC is small enough. Provided that $dC = \frac{c_y y'(z)}{e'(z)}$, we need to assume that either the responsiveness of aid to reform is low enough or the marginal cost of reform is high enough. Let us focus our attention on case (iii). Since $dA > 0$ and $dB > 0$ by hypothesis, we rewrite (a) and (b) as:

(a') $0 < -c_{yy}dy < c_{yz}dz$, and (b') $0 < -\frac{c_{zz}e'(z)-e''(z)c_z}{(e'(z))^2}dz < c_{zy}\frac{1}{e'(z)}dy$. Both inequalities imply that $c_{yy}c_{zz} < (c_{zy})^2 + c_{yy}c_z\frac{e''(z)}{e'(z)}$, which is a contradiction with $c_{yy}c_{zz} \geq (c_{zy})^2$ provided that $c_{yy}c_z\frac{e''(z)}{e'(z)} < 0$.

Proof of Proposition 2:

We solve the game by backwards induction. In Stage 3, the aid agency plugs the value observed for z into function $y^C(z)$. In Stage 2, the recipient government selects $z^{max}(\theta^D, \theta^R) = argmax_{\{z\}}\theta^R c(y^C(z),z) - e(z)$. If $y^C(z)$ is such that $y'^C(z) = \frac{\theta^D c_z(y^C(z),z)}{\theta^R c_y(y^C(z),z)}$, then, condition (9) becomes

$$(\theta^D + \theta^R)c_z(y^C(z),z) = e'(z)$$

.

Then, $z^{max}(\theta^D, \theta^R) = z^*$, provided that $y^C(z^*) = y^*$.

Proof of Proposition 3:

We define function $\gamma(y,z)$ as

$$\gamma(y,z) = \theta^R \frac{c_z(y,z)}{e'(z)}.$$

First, we show that an aid policy package (y,z) entails more government ownership the closer is $\gamma(y,z)$ to one. Given the concavity of the recipient government's utility function, z^{ow} is implicitly defined by equation $\theta^R c_z(y,z^{ow}) - e'(z^{ow}) = 0$. On the other hand, $\gamma(y,z') \to 1$ holds, by definition, for a value of z' such that $\theta^R \frac{c_z(y,z')}{e'(z')} \to 1$. Therefore, $\gamma(y,z') \to 1 \Leftrightarrow z' - z^{ow} \to 0$.

Second, we compute the value of function $\gamma(.)$ at the pairs (y^*,z^*) and (y^{tc},z^{tc}) respectively as $\gamma(y^*,z^*) = \frac{\theta^R}{\theta^R+\theta^D}$ and $\gamma(y^{tc},z^{tc}) = \theta^R \frac{c_z(y^{tc},z^{tc})}{e'(z^{tc})}$. Then, we have that $\gamma(y^*,z^*) > \gamma(y^{tc},z^{tc}) \Leftrightarrow \frac{(\theta^D+\theta^R)c_z(y^{tc},z^{tc})}{e'(z^{tc})} < 1$. On the other hand, we can rewrite Equation (6) as $\frac{\theta^R c_z(y^{tc},z^{tc})+\theta^R c_y(y^{tc},z^{tc})y'(z^{tc})}{e'(z^{tc})} = 1$. Combining this equation with the inequality above, we obtain that

$$\gamma(y^*,z^*) > \gamma(y^{tc},z^{tc}) \Leftrightarrow \frac{\theta^D}{\theta^R} < \frac{c_y(y^{tc},z^{tc})}{c_z(y^{tc},z^{tc})} y'(z^{tc}).$$

Since $OW(y^*,z^*)\langle OW(y^{tc},z^{tc}) \Leftrightarrow \gamma(y^*,z^*)\rangle\gamma(y^{tc},z^{tc})$, Proposition 3 follows immediately.