# Motivation and information in foreign aid: paternalism, responsiveness and ownership*

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**Abstract**

This paper aims to connect theoretical and empirical literature on foreign aid by providing a general formal framework for delegation between donors and recipient leaders. Rather than assuming benevolent donors and self-interested leaders, the model relaxes these assumptions, allowing for both benevolent and non-benevolent actors on either side. Drawing on literature on responsiveness and altruism, the model proposes a normative benchmark anchored in the preferences of citizens in the aid-receiving country. The model is used to examine how conceptions of 'ownership' interact with delegation decisions and aid effectiveness, finding that paternalistic donors may delegate either more or less than is optimal. Extending to asymmetric information, the model distinguishes technical from normative information, and shows how motivational distortions and signal precision jointly shape optimal delegation. Finally, it highlights how actors' incentives to invest in different types of information are affected by delegation decisions. The framework offers new insights for analysing foreign aid and ownership, and raises questions for empirical research on donor-recipient dynamics.

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# 1 Introduction

Principal–agent models are widely used to analyse donor–recipient relationships in foreign aid (Martens et al., 2002; Paul, 2006). In different settings, the incentives and constraints of both actors can lead to sub-optimal outcomes. On the side of the donor (principal), key issues include moral hazard or asymmetric information regarding recipient types and/or actions (Cordella and Dell'Ariccia, 2002, 2007; Amegashie et al., 2007), and credibility constraints in enforcing conditionality (Kletzer, 2005; Svensson, 2000, 2003). On the side of the recipient government/leader (agent), these include (partially) non-benevolent preferences that can lead to diversion of funds and rent-seeking (in the papers cited above), as well as costly effort for implementing governance reforms (Svensson, 2000, 2003), and double moral hazard (hidden action by the principal) (Murshed and Sen, 1995). Donors and recipients may also have asymmetric access to information on state variables (Marchesi et al., 2011; Dreher et al., 2017), requiring signalling.

Following literature on the 'principal's problem' (Ross, 1973), most of these models do not distinguish between social welfare and the principal's objective function. In the foreign aid context, this implies a benevolent/altruistic motivation on the part of donors: relating, for example, to their stated aims to support growth, poverty reduction, or outcomes such as improved health or education (Burnside and Dollar, 2000; Collier and Dollar, 2002; Banerjee et al., 2012). But this approach is perhaps surprising, given the wealth of empirical evidence on the importance of donors' self-interested motivations — including geopolitical, security, or commercial concerns (Alesina and Dollar, 2000; Kuziemko and Werker, 2006; Dreher, Sturm and Vreeland, 2009a,b; Kilby, 2009; Fleck and Kilby, 2010; Dreher, Lang and Reinsberg, 2024).

Responding to this lacuna, a few articles have developed principal-agent models of foreign aid relationships which distinguish between the principal's utility and social welfare; in these cases donor non-benevolence is due, for example, to political or institutional logics of donor agencies (Hefeker and Michaelowa, 2005; De Mesquita and Smith, 2009; Isopi and Mattesini, 2009; Monkam, 2012).[1] The present paper contributes to this stream of the literature.

[1] This echoes models in the economics literature that distinguish between social welfare and principal's utility; e.g. on regulation (Baron, 1988; Laffont and Martimort, 1999; Dal Bó and Di Tella, 2003; Laffont and Tirole, 1991; Besley and Coate, 2003), corruption (Laffont and N'Guessan, 1999; Xu and Li, 2019), and bureaucracies (Alesina and Tabellini, 2007; Tirole, 1994).

## 1.1 Aim and approach of the paper

This paper aims to further connect theoretical and empirical work on donor motivations, by developing a principal-agent model with a symmetric domain of motivations: where *both* donors and recipient leaders could have either benevolent or non-benevolent preferences. This part of the model draws on the policymaking literature on expertise (Callander, 2008), career concerns and input bias (Seabright, 2002; Dewatripont et al., 2000; Prat, 2005), discussed in Section 2.

A second key feature of the model is that it anchors welfare in the preferences of the citizens of the aid-receiving country — that is, those communities that are directly affected by spending on aid programmes. This element results from making connections to two more literatures - on altruism and on responsiveness. In terms of altruism, the literature makes a distinction between paternalistic and non-paternalistic altruism (Archibald and Donaldson, 1976; Becker, 1981; Ray, 1987; Doepke and Zilibotti, 2017). Benefactors with a *paternalistic* motivation care about the effect of their gift on the recipient, but have their own views about what these effects should be. On the other hand, benefactors giving gifts with a *non-paternalistic* motivation, evaluate these effects using the recipient's own preferences.[2] This distinction relates to the willingness to give in-kind gifts or cash transfers, and recalls the concept of merit goods (Musgrave, 1959; Jacobsson et al., 2007; Gangadharan et al., 2018; Savedoff, 2019).

### 1.1.1 Responsiveness

This non-paternalistic focus on recipient preferences relates to the literature on 'responsiveness', a concept in political science which links leaders' choices to the priorities of their citizens.[3] According to Dahl (1989), a "key characteristic of democracy is the continued responsiveness of the government to the preferences of the people". Responsive governments adopt "policies

[2] A third type is *warm glow* altruism, where the giver cares about the gift but not its effect (Andreoni, 1990).

[3] An important feature of responsiveness is that it does not need to be assumed: following Achen (1977, 1978), there is an extensive empirical literature on responsiveness, tracking the relationships between citizen preferences and government actions. For example, Binzer Hobolt and Klemmensen (2008) compare citizen surveys to the government's legislative programme and budget allocations. Egan (2008) uses legislative voting records as the variable of government action. Another approach is 'budgetary responsiveness', which compares the allocation of public funds to public opinion (Bernardi, 2016; Soroka and Wlezien, 2005). In an example prepared for this paper, Figure A.1 in the Appendix shows some preliminary analysis comparing donor and government spending with citizen surveys of the 'Most Important Problem' in two African countries: Uganda and Burkina Faso.

that are signalled as preferred by citizens" (Przeworski et al., 1999). And as Mkandawire (2010) writes, "at the core of democracy is the idea that governments must be systematically responsive to the desires and interests of citizens as expressed through the electoral process."

Responsiveness reflects the idea that government leaders act as the agent to their citizens' collective principal (Ferejohn, 1986; Besley, 2007). But the connection between public preferences and policy choices may not always be strong: Bartels (2015) calls this 'unresponsiveness' or 'biased responsiveness'. Connecting back to the foreign aid literature, the idea that leaders may not be responsive, in the sense of not acting in the interests of their citizens, is often used as an implicit or explicit legitimising narrative for donor control (Nissanke, 2008; Wells, 2020). But there is limited evidence that donors are more responsive to the preferences of citizens in aid-receiving countries (Falk et al., 2017; Melamed et al., 2012; Pritchett, 2015).[4]

Building on this discussion, Section 2 distinguishes between three broad *types* of motivations, which could apply to either donors or leaders. These types are as follows: a *self-interested* type, who cares only about *policy inputs*, such as levels of aid spending, or private goods such as contracts or salaries. Then two *benevolent* types, who both care about the *outcomes* that are delivered for citizens of an aid-receiving country, such as growth, poverty reduction, or health improvements — which can depend on the provision of public goods. Next, a distinction is made within this group, between two types of benevolent motivation: *paternalistic* or *responsive*. Paternalistic types use their own preferences to evaluate the outcomes achieved; whereas responsive types aim to match these with citizens' priorities. Donors and recipient leaders have symmetric domains of motivations: each could be any of these three types. The model then uses a normative benchmark for evaluating policy choices which is also responsive: that is, anchored in the subjective preferences of the aid-receiving population.

Section 3 explores the implications of these motivations in a simple delegation problem, beginning with the case of full information. The model identifies cases where the welfare-maximising choice of delegation is not incentive-compatible for the donor: and shows that in this setting, donors choose weakly less delegation than is optimal.[5]

[4]This may also be relevant for research, for example, Sandefur (2013), looking at academic research presented at the 2013 Centre for the Study of African Economies conference, suggested that "African economists care about jobs; non-African economists care about institutions?"

[5]Empirically, the choice between budget support and project aid is often used to identify the extent of delegation

### 1.1.2 Ownership

This discussion on motivation and delegation in foreign aid relates to the discourse on 'ownership', which is seen as crucial for aid effectiveness (OECD, 2005, 2011). Many definitions of this term abound (Konstantinidis and Reinsberg, 2023; Drazen, 2002; Bird and Willett, 2004; Hasselskog and Schierenbeck, 2017; Buiter, 2007; Brown, 2017; Buffardi, 2013; Chesterman, 2007). For example, ownership is sometimes seen as the alignment of leaders' interests with those of donors (Candel-Sánchez, 2022; Cordella and Dell'Ariccia, 2007), or alternatively as a shift away from donor control towards greater local autonomy (Fraser and Whitfield, 2008). Although donors have made commitments to increasing ownership, delivering on them has been difficult (Reinsberg and Taggart, 2025); and the relationships between donors and recipients of foreign aid remain complex (Swedlund, 2017; Whitfield, 2008). The ownership agenda has also been criticised for focussing too much on the interactions between donors and governments, rather than the perspectives of citizens or civil society — highlighting the need for 'democratic ownership' (Faust, 2010; Brown, 2020) — and re-emphasising the relevance of responsiveness.

Section 4 uses the framework to explore the interactions between different versions of 'ownership' and aid effectiveness, by extending the model to make connections between delegation decisions and implementation efficiency. We find that paternalistic donors may delegate either more or less than is optimal, as they trade off conflicts of interest against relative effectiveness. While the ownership agenda may lead to greater influence of leaders' preferences in aid programming, its impact on welfare is not guaranteed.

### 1.1.3 Information

The second part of the paper discusses information, where donors and recipients can have access to different signals. Knack et al. (2020) show how donors can influence domestic policy choices through their technical analysis and expertise. Meanwhile, drawing on contextual knowledge is crucial for designing successful interventions (Easterly, 2008; Dixit, 2009; Besley and Persson, 2011). Donors' weak understanding of 'local' country contexts can result in poorly designed

from the donor (P) to recipient leader (A) (Hefeker, 2006; Mosley and Abrar, 2006; Morrissey, 2006; Koeberle et al., 2006; Cordella and Dell'Ariccia, 2007; Chauvet et al., 2013).

programmes and ineffective implementation (Grindle, 2004; Ang, 2016; Pritchett et al., 2010; Andrews et al., 2017). Marchesi et al. (2011) and Dreher et al. (2017) explore how differing access to local or international knowledge by donors and recipients — and the potential for information transmission — interacts with their different motivations. They show how 'transparency' can affect the optimal choice of either 'delegation' of discretion to a recipient leader, or 'centralisation', where the donor retains decision-making control.

Section 5 explores interactions between different motivations and actors' access to information, drawing on the approach of Morris and Shin (2002) as well as Veldkamp (2011) and Hellwig et al. (2012). The model's focus on responsive and paternalistic motivations emphasises the importance of information, and also requires a different distinction to be made between types of information, compared to previous work. The model highlights two types of information: *technical information* about which policies lead to which outcomes; and *normative information* about which outcomes are preferred by citizens within the aid-receiving context.[6]

Policymakers can receive both technical and normative information via public and private signals, depending on whether each source is publicly available or not. While *responsive* policymakers are interested in both types of information, *paternalistic* actors focus only on the technical aspects. *Self-interested* types are interested in neither type of information. Given patterns of motivation and information by the donor and the leader, we find that the welfare-maximising choice regarding delegation depends on the parameters in each case. For example, motivational distortions can be offset by the relative precision of signals that are received. Donors' delegation decisions may not align with optimality, as their incentives weigh these tradeoffs differently.

### 1.1.4 The data gap

This analysis also speaks to a well-documented stylised fact: the underprovision of high-quality, timely data in low-income countries — for both national statistics and public opinion (Jerven, 2013; Sandefur and Glassman, 2014; Dang et al., 2023). According to the literature, this arises

[6]Technical information could be observed, for example, from datasets such as household surveys or national statistics, and from causal evidence such as academic articles or policy evaluations. Meanwhile normative information on citizens' priorities could be observed via opinion polling or surveys e.g. Afrobarometer's 'Most Important Problem' survey or the World Values Survey. They could also be observed through reports or advocacy by local civil society actors, press or social medial content, or direct representations to leaders.

from resource and capability constraints (Dang et al., 2023), political incentives — including the temptation to manipulate or withhold data (Sandefur and Glassman, 2014) — and security or logistical barriers that hinder data collection in unstable environments (Siân Herbert, 2013).

Section 6 explores policymakers' incentives to invest in the precision of each type of signal: technical and/or normative; and public and/or private.[7] We find that donors who have chosen to delegate, invest more in public than private information, compared to donors who have not. As such, if donors do not delegate policy decisions to leaders, then their incentive to invest in public signals is low. Signal precision investments also follow the type of the 'agent', so that investment decisions can be used to infer the type of either donor or leader. The model therefore allows us to propose a further potential explanation for the data gap: delegation decisions by donors, as well as different motivations of both policymakers. Section 7 concludes.

## 2 Modelling motivations of donors and leaders

As mentioned in the introduction, the discourse on donor motivation makes a well-established distinction between altruism and self-interest (Maizels and Nissanke, 1984; Lancaster, 2007; Schraeder et al., 1998). For the motivations of domestic leaders in aid-receiving countries, the literature often highlights their relative emphasis on providing public or private goods, reflecting a divide between programmatic or clientelistic policy platforms (De Mesquita, 2004; Robinson and Verdier, 2013; Bardhan and Mookherjee, 2016; Grossman and Slough, 2022). Political settlements, elite bargains, and political institutions can be 'exclusive' or 'extractive' (Acemoglu and Robinson, 2013; Khan, 2010; North et al., 2009). 'Political market imperfections' such as clientelism and patronage can skew public resources towards certain groups (Keefer and Vlaicu, 2008; Keefer, 2007) and leaders may engage in corruption or vote-buying (Khemani, 2015).

[7] The precision of signals can be related to the 'transparency' variable of Marchesi et al. (2011) and Dreher et al. (2017). For technical information in our model, investments in public signal precision could relate, for example, to increased quality and regularity of national statistics data, household surveys, and other relevant datasets; funding for policy evaluations; or funding and support for universities or think tanks that produce causal analysis. Private signal precision could be increased by commissioning unpublished datasets or causal studies. For normative information on local priorities, investments in public signal precision could relate to increasing civil society space and press freedom, or to funding publicly available opinion polls data. Investing in private information about local preferences could include, for example, using participatory approaches within particular programmes.

Drawing on this analysis, first we present a formal model of three types of motivations that both donors and leaders may have. This part is based on a policymaking model which includes both inputs and outcomes, drawing on the literature on expertise in policymaking (Callander, 2008) and also on career concerns and input bias in policymaking (Seabright, 2002; Dewatripont et al., 2000; Prat, 2005).

## 2.1 Policymaking — inputs and outcomes

In this model, the choice variable is a policy $p \in P = \mathbb{R}$ which, in our setting, relates to the design of a given aid programme. Policies involve inputs $x \in X = \mathbb{R}$ and lead to outcomes $y \in Y = \mathbb{R}$. The process of mapping policies onto inputs is straightforward: $x = p$. Inputs lead to outcomes according to a simple policy process $y = x + \theta$ where $\theta \in \mathbb{R}$.

In this setting, inputs could relate to choices such as the level of aid spending, the allocation of aid spending to certain sectors or projects, and the allocation of aid spending to certain contractors or implementing agencies. It could also reflect the inputs for a given policy design: for example for education, the allocation of aid spending to teachers' salaries, and/or contracts for school buildings. Policy inputs could therefore relate to the provision of private goods. Meanwhile outcomes could relate to variables such as economic growth, inequality, or poverty, or outcomes in social sectors e.g. related to health, education, environment etc. Outcomes are therefore connected to the provision of public goods.

### 2.1.1 Welfare

Following the literature on responsiveness, the preferences of citizens in the aid-receiving country provide the normative welfare benchmark of this model. Their outcomes $y$ are affected by aid spending, and their ideal point is $y_c$. Using a simple quadratic loss formulation, welfare $W$ is given by:

$$W = -(y - y_c)^2 \tag{2.1}$$

Which implies that the optimal policy choice is $p^* = y_c - \theta$.

### 2.1.2 State variables

The two state variables in this model are:

- $\theta$ — the *technical* state variable which shows how policies map onto outcomes; and
- $y_c$ — the *normative* state variable which shows which outcomes are preferred by citizens.

## 2.2 Preferences of policymakers

There are two policymaking actors $i \in \mathcal{I} = \{l, d\}$ — domestic leaders $l$ and donors $d$. In contrast to citizens (who only care about outcomes), policymakers can have preferences over either inputs or outcomes. This subsection outlines a key assumption of the model, which is that policymakers' preferences over inputs relate to a self-interested motivation, and their preferences over outcomes relate to a benevolent motivation.

### 2.2.1 Inputs and self-interest

Donor self-interest regarding their preferences over inputs may relate to features such as the amount of money transferred, which could then influence voting behaviour in international fora; or relate to career concerns for donor staff e.g. in targeting a certain amount of spending. Or it may involve preferences for spending via contractors from the donor country, or on particular projects that serve the donors' geopolitical or commercial self-interest.[8]

Meanwhile for the domestic leader, their self-interested preferences over inputs could relate to features such as the amount of funds received, or the amounts of funds that can be transferred as private goods to certain contractors, to supporters or patronage networks, or to preferred regions of the country. Corrupt leaders may focus on inputs that can be diverted e.g. for vote-buying.

For both donors and leaders, we assume that self-interested policymakers have preferences over inputs (not outcomes), and that their ideal point is $x_d \in \mathbb{R}$ for donors, or $x_l \in \mathbb{R}$ for leaders.

[8] Donor self-interested preferences over inputs could also map onto subsequent outcomes in the donor country e.g. security, commercial interests, etc, which are not included in the model. This aspect and the potential for 'mutual interest', where aid policies affect outcomes in both donor and recipient countries, is left for future work.

### 2.2.2 Benevolence and outcomes

As discussed above, benevolent donors and leaders care about outcomes $y$, including indicators like growth, poverty reduction, or health or education outcomes for the citizens of the country receiving aid. These outcomes could be supported by the delivery of public goods and services.

Their ideal points in terms of outcomes differ depending on the benevolent policymakers' type: whether they are responsive or paternalistic. For the responsive leaders or donors who care about citizens' preferences over outcomes, their ideal point is $y_c$, and so their utility function mirrors citizens' welfare $W$. On the other hand, the paternalistic donor or leader would care about outcomes for citizens in the aid-receiving country, but not about citizens' preferences $y_c$. Instead they would apply their own preferences in this case, with ideal outcomes of $y_d \in \mathbb{R}$ for donors or $y_l \in \mathbb{R}$ for leaders.

## 2.3 Types of policymakers

Drawing on this discussion, we assume that each leader or donor $i \in \mathcal{I} = \{l, d\}$ can be one of three types $t_i \in T = \{1, 2, 3\}$. Types 1 and 2 are benevolent and care about outcomes, while type 3 is self-interested and cares about inputs. Within the benevolent types, type 1 is responsive and cares about citizen preferences, while type 2 is paternalistic and has their own preferences for outcomes.[9] The policymakers' utility functions $U_i(t_i), \forall i \in \mathcal{I} = \{l, d\}$ are:

$$
\begin{aligned}
&\textbf{Benevolent types} \\
&\quad \text{Type 1: Responsive} \quad U_i(1) = -(y - y_c)^2 \\
&\quad \text{Type 2: Paternalistic} \quad U_i(2) = -(y - y_i)^2 \\
&\textbf{Non-benevolent types} \\
&\quad \text{Type 3: Self-interested} \quad U_i(3) = -(x - x_i)^2
\end{aligned}
\tag{2.2}
$$

Let us also assume that $0 < y_d, y_l < x_d, x_l$, so that paternalistic distortions are less severe than self-interested ones.

[9] While we have presented three separate types for simplicity here, it is of course also possible that donors or leaders could have a mix of motivations. We leave this aspect for future work.

# 3 Introducing the game

Let us turn to the delegation game. As well as actors and types, there are two roles in the delegation game: the principal $P$ and the agent $A$. Let $A$ denote the agent who chooses policy $p$. Working backwards, let P denote the principal who chooses which actor $i \in \{l, d\}$ takes the role of $A$. Following the usual model, we assume that the donor occupies the role of principal: $P = d$. Then the donor chooses either 'delegation' to the leader with $\mathrm{A} = l$, or 'centralisation' with $\mathrm{A} = d$.

The delegation game involves a pair of actors: one donor and one leader. Each of the partners could be any of the 3 types. Let $\mathbf{t} = T \times T$ be the space of possible type pairs, and let $t = (t_l, t_d) \in \mathbf{t}$ be the pair of types of the leader and the donor in a particular interaction. Let $U_t = \{U_l(t_l), U_d(t_d)\}$. The types are common knowledge, so that each actor knows their own type and the type of their partner.[10]

To fix ideas, we begin with a simple deterministic version of the model with full information of all parameters including the state variables. Assume that $\theta = 0$ and $y_c = 0$, so that $y = x = p$ and the welfare-maximising policy choice is $p^* = 0$.

## 3.1 The deterministic game with common knowledge

In this simple first set-up, the game proceeds as follows:

1. A donor and a leader are matched; their types $(t_d, t_l)$ are common knowledge.
2. The donor (principal) chooses the agent $A \in \mathcal{I}$ (centralisation: $A = d$; delegation: $A = l$).
3. The chosen agent $A$ sets policy $p$; inputs are allocated as $x = p$.
4. Implementation occurs and outcomes $y$ are produced.
5. Payoffs $U_t$ and welfare $W$ are realised.

[10] We leave for future work a model of asymmetric information about partner types.

### 3.2 $A$'s choice of $p$, utility, and welfare

To characterise the game, we proceed by backward induction. First we identify the policy choices that each possible A would make in step 3. Let $p_i(t_i)$ be the policy chosen by each actor, depending on their type.

$$p_i(t_i) = \arg\max_p U_i(p, t_i), \quad \forall i \in \mathcal{I}, \forall t_i \in T$$

Where:

$$p_A(t_A) = \begin{cases} p_d(t_d), & \text{if } A = d, \\ p_l(t_l), & \text{if } A = l. \end{cases}$$

The welfare-maximising choice of $A$ is denoted $A^*$, with:

$$A^* = \arg \max_{A \in \{l,d\}} W(p_A(t_A)),$$

Meanwhile the principal's choice of $A$ is denoted $A^d$, with:

$$A^d = \arg \max_{A \in \{l,d\}} U_d(t_d,\, p_A(t_A)),$$

Table 1 shows A's policy choices and utility, and the consequences for welfare.

| $p_i(t_i)$ | $U_i(t_i, p_i(t_i))$ | $W(p_i(t_i))$ |
|---|---|---|
| $p_i(1) = 0$ | 0 | 0 |
| $p_i(2) = y_i$ | 0 | $-y_i^2$ |
| $p_i(3) = x_i$ | 0 | $-x_i^2$ |

Table 1: Deterministic model — policy choices of 3 types in role $A$ and welfare implications

As shown in the table, the type 1 policymaker chooses the welfare-maximising policy $p_i(1) = 0 = p^*$. For types 2 and 3, their divergence from $p^*$ is due to their preferences, $y_i$ or $x_i$. Each A's utility is zero in this deterministic model. When A is type 2 or 3, there are welfare losses due to the gaps between A's chosen policies and the optimal policy $p^* = 0$.

### 3.2.1 Welfare-maximising choice of $A$

In this deterministic game, where $x = y$, let us simplify exposition in the following way:

$$z_i = \begin{cases} 0 & \text{if } t_i = 1 \\ y_i & \text{if } t_i = 2 \\ x_i & \text{if } t_i = 3 \end{cases}$$

Now from Table 1 we have $W(t, i = A) = -z_i^2$, giving the welfare implications of delegation or centralisation as:

$$W(t, A = d) = -z_d^2 \tag{3.1}$$

$$W(t, A = l) = -z_l^2 \tag{3.2}$$

**Proposition 3.1.** *In the deterministic game with common knowledge, the welfare-maximising choice $A^*$ depends on whichever of the donor or the leader has the smallest distortions in preferences. $A^*$ is given by:*

$$A^* = \begin{cases} l, & \text{if } z_l^2 < z_d^2, \\ l, d, & \text{if } z_l^2 = z_d^2, \\ d, & \text{otherwise.} \end{cases} \tag{3.3}$$

*In particular:*

- *If the leader and donor are different types, the following ordering is used to determine $A^*$: type 1 is preferred to type 2, and type 2 is preferred to type 3.*
- *If donor and leader are both type 1, either $A$ is optimal.*
- *If donor and leader are both type 2, $A^*$ depends on the smaller of $y_l$ and $y_d$.*
- *If donor and leader are both type 3, $A^*$ depends on the smaller of $x_l$ and $x_d$.*

### 3.3 The principal/donor's choice of $A$

Next we wish to find $A^d$, the principal's choice of A $\in \mathcal{I} = \{l, d\}$ in step 2 of the game. To do so, first we find the utility of actor $j \in \mathcal{I}, j \neq A$. This $j$ could be the donor who delegated, or the leader who was not delegated to. These utilities are shown in Table 2, and can depend on $t$, the pair of types and their distortions.

| | $p_A(1)$ | $p_A(2)$ | $p_A(3)$ |
|---|---|---|---|
| $U_j(1, j \neq A)$ | 0 | $-y_i^2$ | $-x_i^2$ |
| $U_j(2, j \neq A)$ | $-y_j^2$ | $-(y_i - y_j)^2$ | $-(x_i - y_j)^2$ |
| $U_j(3, j \neq A)$ | $-x_j^2$ | $-(y_i - x_j)^2$ | $-(x_i - x_j)^2$ |

Table 2: Partner utility for $j \neq A$, for different combinations of $t \in \mathbf{t}$

We can observe that utilities for the partner $j \neq A$ depend on the squared distance between their ideal point and the ideal point of $A$. Given our assumptions about the preference parameters of policymakers, all of these values are negative, except for those on the diagonal (coloured grey) which could equal zero, if preferences align. (That is, if both partners are type 2 and $y_j = y_i$, or if both partners are type 3 and $x_j = x_i$.)

Next, using $z_i$ notation, from Table 2 we have $U_j(t, j \neq A) = -(z_i - z_j)^2$ and so the donor's utilities under centralisation $A = d$ or delegation $A = l$ are:

$$U_d(t, A = d) = 0 \tag{3.4}$$

$$U_d(t, A = l) = -(z_l - z_d)^2 \tag{3.5}$$

**Proposition 3.2.** *In the deterministic game with common knowledge, the principal/donor is indifferent between delegation and centralisation only when preferences align. The donor's choice of $A^d$ is:*

$$A^d = \begin{cases} l, d, & \text{if } z_l = z_d, \\ d, & \text{otherwise.} \end{cases} \tag{3.6}$$

*In particular, donors would prefer to centralise unless:*

1. *Both donor and leader are responsive — type 1*

2. *Both donor and leader are paternalistic — type 2 — and* $y_d = y_l$

3. *Both donor and leader are self-interested — type 3 — and* $x_d = x_l$

### 3.4 Comparing $A^d$ to $A^*$: is the principal's choice of $A$ optimal?

Comparing the decision rules for $A^d$ and $A^*$ we can make some observations. First of all, for the responsive donor (type 1) with $z_d = 0$, we can see that the two expressions align. That is, a responsive donor would make the the welfare-maximising choice, and only delegate to a responsive leader.

On the other hand, for the non-responsive donors (types 2 and 3), we see a key difference. While donors only delegate when preferences align, welfare maximisation would require delegation when $z_l < z_d$ — that is, if the leader's preferences (whether paternalistic or self-interested) are closer to those of citizens, than are those of the donor. Formally, we can compare $A^d$ to $A^*$ with the following result.

**Proposition 3.3.** *In the deterministic model with common knowledge, the incentive-compatible delegation choice of the non-responsive donor involves weakly less delegation to the leader than is optimal.*

*Proof.* Comparing (3.3) and (3.6) we can observe that:

- When $z_l^2 > z_d^2$, the donor's choice to centralise is optimal: $A^d = A^*$
- When $z_l^2 = z_d^2$, the donor's choice to either centralise or delegate is optimal: $A^d = A^*$
- When $z_l^2 < z_d^2$, the donor's choice to centralise is not optimal: $A^d \neq A^*$

Demonstrating a case where donors choose centralisation although delegation is optimal. ■

### 3.4.1 Welfare implications of types and donor control

We can compare welfare impacts of optimal delegation $W(A^*)$ to those of donor choice $W(A^d)$:

$$W(A^d) = -z_d^2 \tag{3.7}$$

$$W(A^*) = -\min\{z_l^2,\, z_d^2\} \tag{3.8}$$

This shows that even with optimal delegation, there would still be welfare costs — that is, if neither type is responsive. For example, if both donors and leaders are type 3, the citizen's maximum possible welfare would be relatively low for either choice of $A$.

Following on from this, we can disaggregate welfare $W(A^d)$ into two components: the maximum welfare available given the types $t$, and the welfare penalty if this maximum is not reached due to donor control, if $A^d$ deviates from $A^*$. Let:

$$W(A^d) = W(A^*) + \Lambda \tag{3.9}$$

Where $\Lambda$ is the welfare penalty from donor control of the delegation decision. We have that:

$$\Lambda = W(A^*) - W(A^d) = z_d^2 - \min\{z_l^2,\, z_d^2\} = \max\{0,\, z_d^2 - z_l^2\}. \tag{3.10}$$

This shows that $\Lambda$ is positive when $z_l$ is less than $z_d$ — that is, when the leader is more responsive than the donor, but the donor does not delegate because of paternalistic or self-interested preferences. On the other hand, if the donor is more responsive than the leader, the welfare penalty is zero.

These findings demonstrate the unsurprising potential for welfare losses when there is a mismatch between the interests of powerful actors and the welfare of citizens who are affected by their choices. In this simple structure so far, we only have conflicts of interest in the model, so there is no reason to delegate. We add further elements to the model in the following sections.

# 4 Ownership and effectiveness

An important concept in foreign aid discourse and practice is that of 'ownership', and its impact on aid effectiveness (OECD, 2005, 2011). But this concept and its application are complex, and there many different ways to understand them (Konstantinidis and Reinsberg, 2023; Drazen, 2002; Bird and Willett, 2004; Hasselskog and Schierenbeck, 2017; Buiter, 2007; Brown, 2017; Buffardi, 2013; Chesterman, 2007). According to Fraser and Whitfield (2008):

*"Two competing, and potentially contradictory, concepts coexist: ownership as commitment to policies, however they were arrived at; and ownership as control over the process and outcomes of choosing policies... multiple definitions make the term useful as a lubricant in development diplomacy. Host governments, donors and NGOs all use 'ownership' as a proxy for the deference others show to their claimed right to influence policy. As such, all can agree that ownership is a good thing."*

We can connect these two views of ownership, and their impacts on aid effectiveness, to our delegation model as follows:

- *Ownership as control*: where aid is more effective if leaders have autonomy to make decisions about aid spending. This relates to effectiveness under delegation.
- *Ownership as commitment*: where aid is more effective if the interests of leaders and donors align: that is, if leaders agree to support the implementation of donor-designed programmes. This relates to effectiveness under centralisation.

To use our model to explore ownership and aid effectiveness, we can conceptualise effectiveness as the accurate translation of inputs $x$ into outcomes $y$. Let us therefore introduce an error into this implementation process, and show how the variance of this error can be affected by the choice of $A$ (the delegation decision) as well as the other parameters of the model. Effectiveness will be increased when the variance in the implementation error is smaller.

In this section, let us continue to assume full information, where the state variables are known to be constant at zero, so that $y_c = 0$ and $\theta = 0$.

## 4.1 Effectiveness under delegation or centralisation

### 4.1.1 Delegation - ownership as control

We begin with delegation, which relates to 'ownership as control'. When $A = l$, we have that:

$$y = x + \varepsilon_{(A=l)}, \quad \varepsilon_{(A=l)} \sim \mathcal{N}\left(0,\, \sigma_l^2(t_l)\right) \tag{4.1}$$

This shows how, under delegation, the effectiveness of achieving planned outcomes depends on $\sigma_l^2(t_l)$, which relates to the capabilities of the leader. This could depend, for example, on their technical abilities and relationships with implementing actors. The smaller this variance, the more effective is delivery — when the leader has the role of $A$ and is able to choose $p$.

Let us also assume that effectiveness depends on $t_l$. In particular, let us group the implementation accuracy of types 1 and 2 together, since these benevolent actors both care about outcomes, while type 3 actors do not:

$$\begin{cases} \sigma_l^2(y) & \text{if } t_l \in \{1, 2\} \\ \sigma_l^2(x) & \text{if } t_l = 3 \end{cases} \qquad \sigma_l^2(x) > \sigma_l^2(y) \tag{4.2}$$

### 4.1.2 Centralisation - ownership as commitment

Meanwhile for centralisation $A = d$, which relates to 'ownership as commitment'. When $A = d$, we assume that there are two factors which impact effectiveness. First, by $\sigma_d^2(t_d)$, which relates to the underlying implementation capabilities of the donor. These follow the same schema as in (4.2), with benevolent donors assumed to be more effective implementers.

Second, effectiveness also depends on the alignment between the leader's ideal policy $p_l(t_l)$ and the actual policy choice $p$, which is chosen by the donor under centralisation.

$$y = x + \varepsilon_{(A=d)} \qquad \varepsilon_{(A=d)} \sim \mathcal{N}\left(0,\, \sigma_d^2(t_d) + \alpha_l(p - p_l(t_l))^2\right) \tag{4.3}$$

The parameter $\alpha_l \geq 0$, which multiplies the squared distance between these policies, captures the extent of this influence or resistance of the leader. For example, if $\alpha_l$ is low, the leader is willing to support donor-chosen policies, even if they diverge from their own preferred policy choice. If $\alpha_l$ is high, then resistance from the leader, when there is even a small misalignment in policies, will lead to decreasing effectiveness (by increasing the variance of $\varepsilon_{(A=d)}$).

This formulation shows how aid effectiveness could be impacted by the donor's choice of $A$. If the donor chooses delegation, effectiveness could potentially be improved by the leader's capability for implementation, due to 'ownership as control'. If the donor chooses centralisation, effectiveness may be increased by 'ownership as commitment', if the donor chooses a policy that is more aligned with the leader's preferences.

## 4.2 The game

We again proceed by backward induction. This time we calculate expected welfare and expected utility, since the game is stochastic. The game follows the same steps as Subsection 3.1.

## 4.3 Welfare-maximising choice of $A$

We analyse the cases of delegation and centralisation in turn.

### 4.3.1 Delegation

Following (4.1), Table 3 shows the policy choices of each type of leader, their expected utility, and the expected welfare. For types 1 and 2, the leader's expected utility is affected by their own implementation errors. For type 3 it is not, because type 3 does not care about achieving outcomes.

| $p_l(t_l)$ | $\mathbb{E}_l[U_l(p_l(t_l))]$ | $\mathbb{E}[W(p_l(t_l))]$ |
|---|---|---|
| $p_l(1) = 0$ | $-\sigma_l^2(y)$ | $-\sigma_l^2(y)$ |
| $p_l(2) = y_l$ | $-\sigma_l^2(y)$ | $-y_l^2 - \sigma_l^2(y)$ |
| $p_l(3) = x_l$ | 0 | $-x_l^2 - \sigma_l^2(x)$ |

Table 3: Delegation: policy choices, $A = l$'s expected utility, and expected welfare

In terms of expected welfare, for leaders of types 2 or 3, there are welfare losses due to non-responsive motivations. Now there are also welfare losses due to implementation errors, for all three types of leader. The overall expected welfare depends on both implementation precision and motivations. Using $z_i$ notation, the general expression for expected welfare under delegation is:

$$\mathbb{E}[W(A = l)] = -z_l^2 - \sigma_l^2 \tag{4.4}$$

### 4.3.2 Centralisation

For welfare under centralisation, following (4.3), this depends on $p$, the policy chosen by the donor. That is:

$$\mathbb{E}[W(t, A = d, p)] = -(p)^2 - \sigma_d^2 - \alpha_l(p - z_l)^2 \tag{4.5}$$

To find this $p$, we begin with the general expressions for the expected utility of benevolent and non-benevolent types. These are:

$$\mathbb{E}[U_d(t \in \{1, 2\}, A = d, p)] = -(p - z_d)^2 - \sigma_d^2 - \alpha_l(p - z_l)^2 \tag{4.6}$$

$$\mathbb{E}[U_d(t = 3, A = d, p)] = -(p - z_d)^2 \tag{4.7}$$

We can find $p'_d$, the donor's strategic choice of $p$, by maximising these expressions. The self-interested donor type 3 therefore chooses $p'_d = x_d$ as in Section 3. (This is because the type 3 does not care about outcomes and hence effectiveness.)

Meanwhile the benevolent donor's choice of $p'_d$ is influenced by its impact on effectiveness due to $\alpha_l$. Taking the derivative of (4.6) w.r.t. $p$ and solving for $p'_d$ gives:

$$p'_d = \frac{z_d + \alpha_l z_l}{1 + \alpha_l} \tag{4.8}$$

After a couple more steps,[11] we find the following Proposition:

**Proposition 4.1.** *In the delegation game where effectiveness is impacted by two aspects of*

[11] Then we substitute $p'_d$ from (4.8) in, to find that:

$$\mathbb{E}[W(A = d)] = -\left(\frac{z_d + \alpha_l z_l}{1 + \alpha_l}\right)^2 - \sigma_d^2 - \alpha_l \left(\frac{z_d - z_l}{1 + \alpha_l}\right)^2 \tag{4.9}$$

*ownership, the welfare-maximizing choice $A^*$, when neither actor is type 3, is:*

$$A^* = \begin{cases} l, & \text{if } z_l^2 - z_d^2 < (1+\alpha_l)(\sigma_d^2 - \sigma_l^2), \\ l, d, & \text{if } z_l^2 - z_d^2 = (1+\alpha_l)(\sigma_d^2 - \sigma_l^2), \\ d, & \text{otherwise.} \end{cases} \tag{4.11}$$

*If $(\sigma_d^2 - \sigma_l^2) \neq 0$, the optimal choice $A^*$ will trade off differences in preferences and implementation capabilities, as follows:*

- *If $(\sigma_d^2 - \sigma_l^2) < 0$ and donor implementation is more effective than leader implementation, delegation will only be optimal if the leader's preference distortions are significantly smaller than those of the donor (that is, a more negative left hand side) with the required wedge between them given by $(1+\alpha_l)(\sigma_d^2 - \sigma_l^2)$.*
- *If $(\sigma_d^2 - \sigma_l^2) > 0$ and leader implementation is more effective than donor implementation, the positive expression $(1+\alpha_l)(\sigma_d^2 - \sigma_l^2)$ provides a space where delegation to the leader could be optimal, even if the donor's preference distortions are smaller (that is, with a positive left hand side).*

*If $(\sigma_d^2 - \sigma_l^2) = 0$, then there is no difference in implementation capability between leaders and donors, and this expression collapses to the game in Section 3. Delegation is optimal when leader distortions are smaller than donor distortions. This also applies when both actors are type 3.*

Due to the assumptions on relative distortions of different actors, and the relative implementation efficiency of different types in (4.2), we again have a clear ordering of types with regards to their welfare impact, with type 1 preferred to type 2, and type 2 preferred to type 3. When both actors are the same type, the optimal choice of $A^*$ depends on the parameters, trading off preferences and efficiency according to Proposition 4.1.

Comparing (4.9) and (4.4) we find that delegation is optimal ($A^* = l$) if:

$$z_l^2 - z_d^2 \leq (1+\alpha_l)(\sigma_d^2 - \sigma_l^2) \tag{4.10}$$

### 4.4 Donor's choice of $A^d$

| $t_d$ | $p_l(1)$ | $p_l(2)$ | $p_l(3)$ |
|---|---|---|---|
| 1 | $-\sigma_l^2(y)$ | $-y_l^2 - \sigma_l^2(y)$ | $-x_l^2 - \sigma_l^2(x)$ |
| 2 | $-y_d^2 - \sigma_l^2(y)$ | $-(y_l - y_d)^2 - \sigma_l^2(y)$ | $-(x_l - y_d)^2 - \sigma_l^2(x)$ |
| 3 | $-x_d^2$ | $-(y_l - x_d)^2$ | $-(x_l - x_d)^2$ |

Table 4: Comparing donor expected utility of delegation to different types of leaders

For the donor's expected utility under delegation, these are shown in Table 4 for the different combinations of types. Using, as before, $p_l(t_l) = z_l$, we can write these more generally for the benevolent types 1 and 2, and the self-interested type 3, as follows:

$$\mathbb{E}[U_d(t \in \{1,2\}, A = l)] = -(z_l - z_d)^2 - \sigma_l^2 \tag{4.12}$$

$$\mathbb{E}[U_d(t = 3, A = l)] = -(z_l - z_d)^2 \tag{4.13}$$

The donor's expected utility under centralisation is as follows. For the type 3 donor, we can substitute $p'_d = x_d$ back into (4.7) to find that type 3's expected utility under centralisation is 0. Comparing this to (4.13), we can observe that the type 3 donor would not delegate unless preferences exactly aligned with the leader, as in Section 3.

Meanwhile for the benevolent donors (types 1 and 2), we can use (4.8) and a couple more steps,[12] to derive their decision rule. We now have the following Proposition.

**Proposition 4.2.** *In the delegation game where effectiveness is impacted by two aspects of*

[12]For the benevolent donors (types 1 and 2), substituting (4.8) into (4.6) gives:

$$\mathbb{E}[U_d(t \in \{1,2\}, A = d)] = -\sigma_d^2 - \frac{\alpha_l}{1+\alpha_l}(z_l - z_d)^2 \tag{4.14}$$

Next can compare (4.13) and (4.14) to show that the donor prefers delegation if:

$$(z_l - z_d)^2 \leq (1+\alpha_l)(\sigma_d^2 - \sigma_l^2) \tag{4.15}$$

*ownership, the benevolent donor's choice of $A^d$ is:*

$$A^d = \begin{cases} l, & \text{if } (z_l - z_d)^2 < (1+\alpha_l)(\sigma_d^2 - \sigma_l^2), \\ l, d & \text{if } (z_l - z_d)^2 = (1+\alpha_l)(\sigma_d^2 - \sigma_l^2), \\ d, & \text{otherwise.} \end{cases} \tag{4.16}$$

*Meanwhile the self-interested donor would only delegate if $x_l = x_d$.*

## 4.5 Comparing $A^d$ to $A^*$: is the principal's choice of $A$ optimal?

The decision rules in Propositions 4.1 and 4.2 share the same right-hand side, which includes the 'ownership' parameters which matter for effectiveness. These are $\sigma_d^2 - \sigma_l^2$, which reflects the impact of 'ownership as control'; as well as $(1 + \alpha_l)$, which reflects the impact of 'ownership as commitment'. The left hand sides of the expressions differ, which could lead to a divergence between $A^d$ and $A^*$.

For the type 1 donor, however, their delegation decisions align with welfare, as we can observe by setting $z_d$ to zero in the expressions above. We can observe that a type 1 donor would not delegate if donor implementation was more effective than leader implementation, nor would they delegate to a type 3. On the other hand if, leader implementation was more effective, the responsive donor's choice of delegation or centralisation would trade off preference distortions with relative effectiveness, in line with $A^*$.

For the type 3 donor, it would be optimal to delegate when $z_l < z_d$, but the donor would not do so (as before in Section 3). Meanwhile for the type 2 donor, they would never delegate to a type 3 leader, which is in line with optimality. But if they face a benevolent leader, we can find delegation when it is not optimal, as well as centralisation when it is not optimal: shown in the following Proposition.

**Proposition 4.3.** *In the stochastic implementation model with common knowledge, for a type 2 donor matched with either a type 1 or type 2 leader and depending on the parameters, we may have non-optimal delegation or non-optimal centralisation (or neither).*

*Proof.* Let us again examine the three cases, to compare $A^d$ and $A^*$.

- If $(\sigma_d^2 - \sigma_l^2) = 0$ and there is no difference in implementation capability between leaders and donors. Then these expressions collapse to the game in section 3, with the same comparison between $A^d$ and $A^*$. That is, paternalistic donors would delegate only when preferences exactly align, which may be less than is optimal.

- If $(\sigma_d^2 - \sigma_l^2) < 0$ and donor implementation is more effective than leader implementation. In this case, a paternalistic donor will never delegate. But delegation could be optimal if the leader's preference distortions are significantly smaller than those of the donor, with the required wedge between them given by $(1+\alpha_l)(\sigma_d^2 - \sigma_l^2)$. So in this case, similar to the game in Section 3, we may have cases where delegation is optimal because donor preferences are much less responsive than those of leaders, but the donor chooses centralisation.

- If $(\sigma_d^2 - \sigma_l^2) > 0$ and leader implementation is more effective than donor implementation. In this case, the positive expression $(1+\alpha_l)(\sigma_d^2 - \sigma_l^2)$ provides a space where delegation to the leader could be optimal, even if the donor is more responsive (that is, with a positive left hand side in the $A^*$ expression). Meanwhile for the donor's choice $A^d$, they may delegate if the leader's preferences are close enough to their own, with this limit in proximity given by the $(1 + \alpha_l)(\sigma_d^2 - \sigma_l^2)$ expression. These two decision rules may not overlap.

This demonstrates that when leaders are more effective implementers, non-optimal delegation or non-optimal centralisation may be chosen by the paternalistic donor. ■

This third case shows that, if the leader's implementation efficiency is higher than the donor's, the donor will delegate if the preferences of the leader are closely enough aligned to their own. In contrast to Section 3, they do not need to be exactly aligned. The required proximity is reduced when the parameters on the right hand side are higher. In particular, the greater the leader's capability for delivery relative to that of donors, the larger the difference in preferences the donor will tolerate for delegation. This is further increased when $\alpha_l$ is high and the leader would resist different donor policies under centralisation. This demonstrates a tradeoff between preference distortions and implementation efficiency.

One interesting implication of this formulation is that leaders cannot induce delegation only by resistance to donor-chosen policy under centralisation $\alpha_l$. They also need to have higher implementation efficiency that the donor, otherwise the term on the right remains zero. Leaders can shift policy in their preferred direction by a joint effort of increasing their implementation efficiency under delegation, and resisting donor choices under centralisation.

**Proposition 4.4.** *In the stochastic implementation model with common knowledge, both forms of 'ownership' can give greater weight to leader preferences in policy decisions, and/or more delegation. But this does not necessarily improve welfare, which depends on the responsiveness of policymakers' preferences, as well as their implementation efficiency.*

This result echoes the 'democratic ownership' critique: efforts to increase ownership that focus only on donor-leader relations do not guarantee welfare gains — even if they improve the efficiency of implementation. Welfare improvements require both efficient implementation, and that the motivations of policymakers emphasise citizen preferences and responsiveness.

# 5 The model with motivation and information

Next we move to a model with stochastic state variables, and both public and private signals received by policymakers. The modelling approach draws on Morris and Shin (2002) as well as Veldkamp (2011) and Hellwig et al. (2012). For expositional clarity, we do not include implementation errors from the game in Section 4, just the motivational issues from Section 3.

Recall that we have two state variables: $\theta$ for technical information about mapping policies onto outcomes; and $y_c$ for normative information about citizens' preferred outcomes. We can no longer use the shorthand of $z_i$, because $y$ may now differ from $x$, due to stochastic $\theta$.

## 5.1 Public and private signals

The state variables have the following prior independent distributions:

$$\theta \sim \mathcal{N}(0, \sigma_\theta^2), \quad \tau_\theta = \frac{1}{\sigma_\theta^2}$$

$$y_c \sim \mathcal{N}(0, \sigma^2_{y_c}), \quad \tau_{y_c} = \frac{1}{\sigma^2_{y_c}}$$

Where $\tau_{y_c}$ and $\tau_\theta$ are precision terms. The public signals take the form:

$$s_\theta = \theta + \zeta \qquad \zeta \sim \mathcal{N}(0,\, \sigma^2_\zeta) \qquad \tau_\theta = \frac{1}{\sigma^2_\zeta} \tag{5.1}$$

$$s_{y_c} = y_c + \eta \qquad \eta \sim \mathcal{N}(0,\, \sigma^2_\eta) \qquad \tau_\eta = \frac{1}{\sigma^2_\eta} \tag{5.2}$$

Where $s = (s_{y_c}, s_\theta)$ is the public signal that both policymakers receive, and $\eta$ and $\zeta$ are independently distributed from each other. $\tau_\eta$ and $\tau_\zeta$ are the precisions of the public signals.

Meanwhile the independently distributed private signals take the following form, $\forall i \in \mathcal{I}$, where $\tau^i_\eta$ and $\tau^i_\zeta$ denote the precision of the private signals..

$$s^i_\theta = \theta + \zeta^i \qquad \zeta^i \sim \mathcal{N}(0,\, \sigma^2_{\zeta^i}) \qquad \tau_{\zeta^i} = \frac{1}{\sigma^2_{\zeta_i}} \tag{5.3}$$

$$s^i_{y_c} = y_c + \eta^i \qquad \eta^i \sim \mathcal{N}(0,\, \sigma^2_{\eta^i}) \qquad \tau_{\eta^i} = \frac{1}{\sigma^2_{\eta^i}} \tag{5.4}$$

Where $s^i = (s^i_{y_c}, s^i_\theta)$ is the private signal that both policymakers receive, and $\eta^i$ and $\zeta^i$ are independently distributed from each other, and from $\eta$ and $\zeta$. As before, $\tau^i_\eta$ and $\tau^i_\zeta$ are the precisions of the private signals.

## 5.2 Types and information

Let $S^i = (s, s^i)\ \forall i \in \mathcal{I}$, since as described above, all agents can observe public and private signals $s$ and $s^i$. However, due to their differing utility functions, each type of agent will learn from the signals in different ways. In particular, some types of agents will not use signals to update their priors, if the variables to which they relate do not affect their expected utility. Let $\mathcal{J}(t_i) \subseteq S^i$: the subset of signals that actor $i$ of type $t_i$ uses for belief updating.

Let $\mathbf{s}^i_{y_c} = (s_{y_c}, s^i_{y_c})$ and $\mathbf{s}^i_\theta = (s_\theta, s^i_\theta)$ be the normative and technical signals respectively, that can be observed by all policymakers $\forall i \in I$. Now we have that:

$$\mathcal{J}(t_i) = \begin{cases} \{\mathbf{s}^i_{y_c}, \mathbf{s}^i_\theta\}, & t_i = 1 \text{ (Responsive)} \\ \{\mathbf{s}^i_\theta\}, & t_i = 2 \text{ (Paternalistic)} \\ \emptyset, & t_i = 3 \text{ (Self-interested)} \end{cases}$$

This is because type 1 policymakers make use of $\mathbf{s}^i_{y_c}$ and $\mathbf{s}^i_\theta$ to learn, and update their beliefs, type 2 policymakers only make use of $\mathbf{s}^i_\theta$ to update their beliefs, and type 3 policymakers do not make use of any signals.

This provides us with the following prior and posterior variances $\forall i \in \mathcal{I}$, with the posterior variance resulting only when signals are made use of for learning — which depends on the type of actor.

$$\text{Var}[\theta] = \frac{1}{\tau_\theta} \qquad \text{Var}_i[\theta \mid \mathbf{s}^i_\theta] = \frac{1}{\tau_\theta + \tau_\zeta + \tau_{\zeta^i}} \tag{5.5}$$

$$\text{Var}[y_c] = \frac{1}{\tau_{y_c}} \qquad \text{Var}_i[y_c \mid \mathbf{s}^i_{y_c}] = \frac{1}{\tau_{y_c} + \tau_\eta + \tau_{\eta^i}} \tag{5.6}$$

Assuming that the variances of all public and private signals are non-zero, this implies that the posterior variances are strictly smaller than the prior variances.

### 5.3 The game with signals

In this set-up, the game proceeds as follows:

1. A donor and a leader are matched; their types $(t_d, t_l)$ are common knowledge.
2. The donor (principal) chooses the agent $A \in \mathcal{I}$ (centralisation: $A = d$; delegation: $A = l$).
3. ***Public and private signals are realised and observed.***
4. The chosen agent $A$ sets policy $p$; inputs are allocated as $x = p$.
5. Implementation occurs and outcomes $y$ are produced.
6. Payoffs $U_t$ and welfare $W$ are realised.

To characterise the game, we proceed by backward induction.

### 5.3.1 Step 2

**A's choice of $p$:** Recalling that $y = p + \theta$, the ideal policy choices for each type of A are:

- $p_i(1) = \mathbb{E}_i[y_c \mid \mathbf{s}^i_{y_c}] - \mathbb{E}_i[\theta \mid \mathbf{s}^i_\theta]$
- $p_i(2) = y_i - \mathbb{E}_i[\theta \mid \mathbf{s}^i_\theta]$
- $p_i(3) = x_i$

**Expected welfare impact and expected utility of $A$:** Table 5 shows how these information issues affect the A's expected utility and expected welfare.

| $p_i(t_i)$ | $\mathbb{E}_i[U_i(t, p_i(t_i))]$ | $\mathbb{E}[W(p_i(t_i))]$ |
|---|---|---|
| $p_i(1) = \mathbb{E}_i[y_c \mid \mathbf{s}^i_{y_c}] - \mathbb{E}_i[\theta \mid \mathbf{s}^i_\theta]$ | $-\text{Var}_i[\theta \mid \mathbf{s}^i_\theta] - \text{Var}_i[y_c \mid \mathbf{s}^i_{y_c}]$ | $-\text{Var}_i[\theta \mid \mathbf{s}^i_\theta] - \text{Var}_i[y_c \mid \mathbf{s}^i_{y_c}]$ |
| $p_i(2) = y_i - \mathbb{E}_i[\theta \mid \mathbf{s}^i_\theta]$ | $-\text{Var}_i[\theta \mid \mathbf{s}^i_\theta]$ | $-y_i^2 - \text{Var}_i[\theta \mid \mathbf{s}^i_\theta] - \text{Var}[y_c]$ |
| $p_i(3) = x_i$ | 0 | $-x_i^2 - \text{Var}[\theta] - \text{Var}[y_c]$ |

Table 5: Policy choices, expected utility of A, and expected welfare with information

We can observe from Table 5 that:

- For the expected utility of an A of type 1, this is reduced by the variance of both technical information $\theta$ and normative information $y_c$. However, the variance in the state variables has been mitigated by the precision of the signals $\mathbf{s}^i_\theta$ and $\mathbf{s}^i_{y_c}$, which the type 1 policymaker is using to inform their policy choice.
  - Expected welfare is the same as expected utility for an A of type 1.
- For the expected utility of an A of type 2, this is reduced by the variance in the technical state variable $\theta$, which is mitigated by the precision of the signals $\mathbf{s}^i_\theta$ that they are using to inform their policy choice.
  - For expected welfare with an A of a type 2, there are two additional distortions (shown in blue): one from their paternalistic motivations $y_i$, and one from the variance in $y_c$.

This variance around citizen preferences is not mitigated, since the type 2 policymaker is not making use of the signals $\mathbf{s}^i_{y_c}$.

- For an A of a type 3, their expected utility is unaffected by the noisy policy environment, since they are not interested in outcomes.
  - The expected welfare loss of A of a type 3 relates both to their self-interested preferences, and to the noisy policy environment. The latter is not mitigated since they are not making use of the signals about technical information or citizen preferences.

**Welfare ordering of $A$** The welfare ordering of the types is as follows, trading off signal precision and preference distortions where relevant. When actors are the same type:

- Both actors type 1: optimal delegation depends on the precisions of both technical and normative signals. Either may be stronger for either actor, and the welfare-maximising delegation choice takes account of this.
- Both actors type 2: the prior variance of $y_c$ would affect both of these actors in the same way, so the welfare tradeoff between them would relate to the precision of their technical signals and their distorted preferences.
- Both actors type 3: the prior variance of $y_c$ and $\theta$ would affect both of these actors in the same way, so the welfare tradeoff would only relate to their preference distortions.

When actors are different types:

- Type 1 and type 2: the optimal choice of $A$ would depend on whether the precision of the type 2's technical information was high enough, to offset the welfare costs of them not tracking signals of $y_c$, and the paternalistic preference distortions. This is possible.
- Type 1 and type 3: here type 1 dominates in welfare terms.
- Type 2 and type 3: here type 2 dominates in welfare terms.

As such, we have the usual ordering of types, with the exception that type 2 could potentially dominate type 1 in terms of welfare, for certain parameter values.

### 5.3.2 Expected utility of principal/donor

Next we explore the donor's expected utility of $A \in \{l, d\}$ in the stochastic policy environment with public and private signals, in Table 6.

| $t_d$ | $p_l(1)$ | $p_l(2)$ | $p_l(3)$ |
|---|---|---|---|
| 1 | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}_l[y_c \mid \mathbf{s}_{y_c}^l]$ | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}[y_c] - y_l^2$ | $-\text{Var}[\theta] - \text{Var}[y_c] - x_l^2$ |
| 2 | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}_l[y_c \mid \mathbf{s}_{y_c}^l] - y_d^2$ | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - (y_l - y_d)^2$ | $-\text{Var}[\theta] - (x_l - y_d)^2$ |
| 3 | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}_l[y_c \mid \mathbf{s}_{y_c}^l] - x_d^2$ | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - (y_l - x_d)^2$ | $-(x_l - x_d)^2$ |

Table 6: Comparing donor expected utility of delegation to different types of leaders

We can observe some perhaps surprising results. The expected utility by donor type is shown in the rows, for different types of leaders in the columns. We can observe that the expected impact of the information environment depends on the leader type as well as the donor type.

In particular, the expected utility is affected by the precision of the signals that A is observing, even if the donor would not be observing those signals if they were in A's role. This is because the variance of the policy action still matters for the donor.

- For a type 1 donor, as above, their expected utility mirrors expected welfare in Table 5.
- For a type 2 donor, there are the usual motivational differences plus
  - For delegation to a type 1 leader, their expected utility is affected by the posterior variances in both state variables, including $y_c$ which they would not observe themselves.
  - For delegation to a type 2 leader, the impact of noisy information on their expected utility is just through the posterior variances on $\theta$, which both donor and leader observe. The unmitigated noise in $y_c$ does not affect the donor in this case.
  - For delegation to a type 3 leader, they are affected by the unmitigated noise of $\theta$ - because the type 3 leader is not updating using these signals.
- For a type 3 donor, there are the usual motivational differences plus

– If they delegate to a type 1 leader, there is (mitigated) noise due to both state variables

– If they delegate to a type 2 leader, there is (mitigated) noise due to noise in $\theta$

– If they delegate to a type 3 leader, there is no impact of information noise.

In sum, the posterior variances affect a delegating donor's expected utility, when the leader is tracking those variables. Meanwhile, the prior variances (in green) affect a delegating donor's expected utility when the leader is not tracking them, but the donor would in the $A$ role.

### 5.4 Comparing the principal's choice of $A^d$ to the optimal choice of $A^*$

We can do this for each type of donor in turn. As before, the type 1 donor's expected utility aligns with welfare. A type 3 donor's comparison mirrors that in earlier sections. They would never delegate to a type 1 or 2 leader, although it would always be optimal to do so. When facing a type 3 leader, they would only delegate if their preferences align - though optimality would require delegation if the leader's preference distortions were smaller.

For the type 2 donor, as shown in more detail in Table 7, delegation to a type 3 leader would never be optimal, nor would it be chosen. For delegation to type 1 or 2 leaders, the type 2 donor would only delegate if the precision of the leader's private technical information relative to their own, was enough to offset other distortions — which may be possible. For welfare, optimality in delegation to type 1 or type 2 would depend on the parameters: where signal precision and motivations would enter differently from the donor's delegation decision.

| Case | $\mathbb{E}_d[U_d(t_2, p(A))]$ | $\mathbb{E}[W(p(A))]$ |
|---|---|---|
| $A = l,\ t_l = 1$ | $-y_d^2 - \text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}_l[y_c \mid \mathbf{s}_{y_c}^l]$ | $-\text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}_l[y_c \mid \mathbf{s}_{y_c}^l]$ |
| $A = l,\ t_l = 2$ | $-(y_l - y_d)^2 - \text{Var}_l[\theta \mid \mathbf{s}_\theta^l]$ | $-y_l^2 - \text{Var}_l[\theta \mid \mathbf{s}_\theta^l] - \text{Var}[y_c]$ |
| $A = l,\ t_l = 3$ | $-(x_l - y_d)^2 - \text{Var}[\theta]$ | $-x_l^2 - \text{Var}[\theta] - \text{Var}[y_c]$ |
| $A = d,\ t_d = 2$ | $-\text{Var}_d[\theta \mid \mathbf{s}_\theta^d]$ | $-y_d^2 - \text{Var}_d[\theta \mid \mathbf{s}_\theta^d] - \text{Var}[y_c]$ |

Table 7: Donor type 2 utility and welfare under delegation and centralisation.

In the next section, we use this model to explore the incentives for investment in different types of information.

# 6 Acquisition of Public and Private Information

Next we allow policymakers to invest in the precision of public and private signals of the two state variables: technical information $\theta$; and information on citizen preferences $y_c$.

## 6.1 Investing in the precision of public and private signals

We define a simple cost function : $C_i(\tau_\eta, \tau_\zeta, \tau_{\eta^i}, \tau_{\zeta^i}) \ \ \forall i \in \mathcal{I}$ for acquiring precision of the public signals $\tau_\eta$ and $\tau_\zeta$ and $i$'s own private signals $\tau_{\eta^i}$ and $\tau_{\zeta^i}$ as follows:

$$C_i(\tau_\eta, \tau_\zeta) = \frac{k_\eta}{2}\tau_\eta^2 + \frac{k_\zeta}{2}\tau_\zeta^2 + \frac{k_{\eta^i}}{2}\tau_{\eta^i}^2 + \frac{k_{\zeta^i}}{2}\tau_{\zeta^i}^2 \tag{6.1}$$

$$\text{where} \quad k_\eta > 0, \quad k_\zeta > 0, \quad k_{\eta^i} > 0, \quad k_{\zeta^i} > 0 \tag{6.2}$$

Which is increasing, convex, and twice differentiable[13], and where $k_\eta$, $k_\zeta$ $k_\eta^i$ and $k_\zeta^i$ are positive scaling parameters that determine the marginal cost of acquiring precision for each signal.[14]

While these costs affect decisions about investment in precision, let us assume that they are infinitesimal compared to the payoffs of policy choices, and so do not enter the expected utility or welfare expressions later in this section.

## 6.2 The game with signals and acquisition of precision

In this set-up, the game proceeds as follows:

1. A donor and a leader are matched; their types $(t_d, t_l)$ are common knowledge.

2. The donor (principal) chooses the agent $A \in \mathcal{I}$ (centralisation: $A = d$; delegation: $A = l$).

[13] And omits any scale effects in precision of the various signals, or complementarities between them, which we leave for future work.

[14] The specification of this function implies that actors cannot invest in the precision of the private signal of their partner.

3. ***Each actor*** $i \in \mathcal{I}$ ***selects the precision of public and private signals:*** $\tau_\eta, \tau_\zeta, \tau_{\eta^i}, \tau_{\zeta^i}$**.**

4. Public and private signals are realised and observed.

5. The chosen agent $A$ sets policy $p$; inputs are allocated as $x = p$.

6. Implementation occurs and outcomes $y$ are produced.

7. Payoffs $U_t$ and welfare $W$ are realised.

### 6.2.1 Step 5 and Step 7

We find the same results as for the game in Section 5 for: A's choice of $p$; the expected welfare and expected utility of both policymakers. These are shown in Tables 5 and 6.

### 6.2.2 Step 3

In this step, both actors decide which investments to make in the precision of each type of public and private signals. We find that an actor's signal precision investments depend on the choice of A in Step 2, as follows.

**For $i$ = A chosen by the donor in Step 2:** For $i$ = A, given that they will choose their own ideal policy in Step 5, the policymaker chooses precision investments that will improve their own expected utility, given that choice. These investment choices are shown in Table 8. In summary:

| | $\tau_\eta,\ \tau_{\eta^i}$ | $\tau_\zeta,\ \tau_{\zeta^i}$ |
|---|---|---|
| $t_d = 1$ | $\frac{\tau_{\eta^i}}{\tau_\eta} = \frac{k_\eta}{k_{\eta^i}}$ | $\frac{\tau_{\zeta^i}}{\tau_\zeta} = \frac{k_\zeta}{k_{\zeta^i}}$ |
| $t_d = 2$ | 0 | $\frac{\tau_{\zeta^i}}{\tau_\zeta} = \frac{k_\zeta}{k_{\zeta^i}}$ |
| $t_d = 3$ | 0 | 0 |

Table 8: Investments in signal precision of different types of policymaker

- For type 1 actors (responsive), they invest in both the precision of technical information, and in the precision of normative information about local preferences. Their investments

in public and private signal precision depend on the relative costs of these investments, since public and private signals are substitutes.

- For type 2 actors (paternalistic), they invest in the precision of technical information only. Their relative investments in public and private signal precision depends on the relative costs of these investments, since public and private signals are substitutes.
- For type 3 actors (self-interested), they do not make any investments in signal precision.

**For $j \neq$ A chosen by the donor in Step 2:** As before, A will choose their ideal policy in Step 5 after receiving public and private signals. For $j \neq$ A, the actor who has not been chosen as A, they choose their investment in signal precision to maximise their own expected utility, given A's type. These choices are given in Table 9.

| | $t_l = 1$ | $t_l = 2$ | $t_l = 3$ |
|---|---|---|---|
| $t_d = 1$ | $\tau_\zeta > 0, \tau_\eta > 0$ | $\tau_\zeta > 0, \tau_\eta = 0$ | $\tau_\zeta = 0, \tau_\eta = 0$ |
| $t_d = 2$ | $\tau_\zeta > 0, \tau_\eta > 0$ | $\tau_\zeta > 0, \tau_\eta = 0$ | $\tau_\zeta = 0, \tau_\eta = 0$ |
| $t_d = 3$ | $\tau_\zeta > 0, \tau_\eta > 0$ | $\tau_\zeta > 0, \tau_\eta = 0$ | $\tau_\zeta = 0, \tau_\eta = 0$ |

Table 9: Comparing $j \neq$ A investment in signal precision in the **t** space

Reading this table from the point of view of donors, we find that when donors delegate to leaders, they no longer invest in their own private signals, but only invest in public information. And the donor's investments in public signal precision reflect the type of the leader to whom they delegate, not their own type. In particular, regardless of their own type:

- For delegation to type 1 leaders, donors invest in both the precision of public signals of technical information, and in the precision of public signals about local preferences.
- For delegation to type 2 leaders, donors invest in the precision of public signals of technical information only.
- For delegation to type 3 leaders, donors do not make any investments in signal precision.

### 6.3 Empirical questions

These findings could be amenable to empirical investigation. In particular, if we can observe delegation decisions, and investments in different types of information, then the investments that donors make could reveal either their types, or the types of the leaders to whom they are delegating. Therefore, low investments in technical information (such as policy evaluations and national statistics) might reflect the presence of type 3 policymakers. Similarly, low investments in normative information (such as polling, press freedom, and civil society space) could mean that donors and/or leaders are either paternalistic or self-interested.

On the other hand, if the delegation decision is not observable, but we can observe the relative investments in public and private signals by donors, these investments could provide a measure of whether or not they are, in fact, delegating policymaking to leaders. In particular, if a donor invests more in public information that in private information — and/or shares any private information it has with leaders rather than withholding it — this could imply that the donor is indeed delegating decision-making power to leaders. Conversely, an underinvestment in public signal precision by donors, would suggest that delegation is not occurring.

These investment decisions are symmetric for a leader who has not been chosen as A. In particular, a leader who does not receive delegated opportunities to choose policies, would not be expected to invest in their own private signals — only public signals. Empirically, an underinvestment in private signals by aid-receiving governments (for example, not investing in the capabilities of civil servant analysts) could suggest that delegation is not occurring.

### 6.4 A third strategy

As an aside, let us examine a third possible strategy, that does not fall into quite the same structure of the game described thus far. If an actor was interested in process as well as outcomes — that is, if they had preferences over which actor took the role of A — this may affect their investments in information. Specifically, if a policymaker wanted to widen the gap in expected welfare between $A = d$ and $A = l$, in order to justify $A = d$ as a 'legitimising narrative' for their own control, what effect would this have?

| | $t_l = 1$ | | $t_l = 2$ | | $t_l = 3$ | |
|---|---|---|---|---|---|---|
| $t_d = 1$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} < \frac{k_{\zeta^d}}{k_\zeta}$, | $\frac{\tau_\eta}{\tau_{\eta^d}} < \frac{k_{\eta^d}}{k_\eta}$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} < \frac{k_{\zeta^d}}{k_\zeta}$, | $\frac{\tau_\eta}{\tau_{\eta^d}} = \frac{k_{\eta^d}}{k_\eta}$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} = \frac{k_{\zeta^d}}{k_\zeta}$, | $\frac{\tau_\eta}{\tau_{\eta^d}} = \frac{k_{\eta^d}}{k_\eta}$ |
| $t_d = 2$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} < \frac{k_{\zeta^d}}{k_\zeta}$, | $\tau_\eta = 0$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} < \frac{k_{\zeta^d}}{k_\zeta}$, | $\tau_\eta = 0$ | $\frac{\tau_\zeta}{\tau_{\zeta^d}} = \frac{k_{\zeta^d}}{k_\zeta}$, | $\tau_\eta = 0$ |
| $t_d = 3$ | $\tau_\zeta = 0, \tau_\eta = 0$ | | $\tau_\zeta = 0, \tau_\eta = 0$ | | $\tau_\zeta = 0, \tau_\eta = 0$ | |

Table 10: Investments in precision to maximise expected welfare difference: $A = d$ and $A = l$

The information investments in this case are shown in Table 10. Compared to Table 8, policymakers with this strategy would reduce their relative investments in public information, and increase their relative investments in private information: increasing the gap between expected welfare of their own decision-making, compared to that of their partner. (This occurs for signals that both donor and leader are learning from — which depends on $t$. For example, if both partners are type 2, they both learn from public signals about $\theta$). So a relative underinvestment in public information (compared to the optimal ratio) may denote a breakdown of trust between partners, and a power struggle between them.

# 7 Conclusion

The variety of possible motivations and information access, of both donors and leaders, suggests that developing a model which allows for these different configurations could be fruitful. The model in this paper aims to do so, and has two key features. First, it is neutral with respect to motivations, with a symmetric domain for donors and leaders: making no assumptions about whether donors are more or less benevolent than leaders — but allowing for any combination of cases. This assumption connects the delegation and motivation literature, allowing researchers to explore the interactions between motivation, information and delegation without assumed ranking of motivations.

The relationship between donors and recipients of foreign aid is shaped by tensions around preferences and information, which influence donors' choices of delegation or centralisation, and the welfare implications of those choices. This paper explores a range of motivations for both donors and leaders, while anchoring welfare considerations in the subjective preferences of

citizens in aid-receiving countries. A key feature of this model is that information on a) technical outcomes and b) local citizen preferences play different roles within its structure. In addition, both donors and leaders can suffer from information and/or motivation problems.

We find that whether or not delegation is optimal is context specific, given the potential for informational and motivational problems on both sides. We find cases where the welfare-maximising choice of delegation or centralisation is not incentive-compatible for the donor/-principal. The model explores how ownership can impact effectiveness both via the choice of agent and by the alignment of interests. Motivations also affect policymakers' incentives to invest in public and private signals of technical and normative information. The 'data gap' in aid-receiving countries may relate to lack of delegation by donors and/or a breakdown of trust between partners, as well as revealing the motivational types of policymakers.

# A Budgetary responsiveness - comparing donors & governments

**Burkina Faso**

| Functions of government (COFOG) | Most Important Problem % 2012 | Public spending % allocation 2013 | | |
|---|---|---|---|---|
| | | Government (88%) | Foreign Aid (12%) | Aggregate Budget |
| 04 – Economic affairs | 39% | 32% | 38% | 33% |
| 06 – Housing and community amenities | 24% | 1% | 5% | 1% |
| 07 – Health | 20% | 4% | 7% | 5% |
| 09 – Education | 8% | 14% | 15% | 14% |
| 03 – Public order and safety | 7% | 2% | 4% | 2% |
| 10 – Social protection | 0% | 3% | 9% | 4% |
| 02 – Defence | 0% | 2% | 0% | 2% |
| 05 – Environmental protection | 0% | 0% | 7% | 1% |
| 08 – Recreation, culture and religion | 0% | 6% | 0% | 5% |

**Uganda**

| Functions of government (COFOG) | Most Important Problem % 2012 | Public spending % allocation 2013 | | |
|---|---|---|---|---|
| | | Government (77%) | Foreign Aid (23%) | Aggregate Budget |
| 04 – Economic affairs | 46% | 22% | 23% | 22% |
| 07 – Health | 13% | 7% | 42% | 15% |
| 03 – Public order and safety | 10% | 7% | 5% | 7% |
| 06 – Housing and community amenities | 8% | 2% | 3% | 2% |
| 09 – Education | 8% | 16% | 5% | 13% |
| 10 – Social protection | 1% | 4% | 10% | 5% |
| 02 – Defence | 0% | 8% | 0% | 6% |
| 05 – Environmental protection | 0% | 0% | 5% | 2% |
| 08 – Recreation, culture and religion | 0% | 0% | 0% | 0% |

*Data sources: Afrobarometer, OECD/DAC CRS, BOOST, UNCTAD. Author's methodology and calculations.*

Figure A.1: Budgetary responsiveness in Burkina Faso and Uganda. The chart compares citizen priorities to public spending allocations in Uganda and Burkina Faso in 2012-3. The left-hand bars show the proportion of people who viewed an issue as the most important problem in their country, and the subsequent bars show the allocation of public spending on those issues in the following year. In these and other aid-receiving countries, donor funding can be a significant part of overall public spending, so this allocation is given for three different totals: domestic resources; aid funds; and the total of both – the aggregate budget. The data show some interesting patterns. In Uganda, health is the most important problem for 13 per cent of citizens, but makes up 42 per cent of aid spending, compared with 7 per cent for the government budget, and 15 per cent of the aggregate budget. Meanwhile in Burkina Faso, 23 per cent of people cite 'water supply' as their country's most important problem (classified under housing and community amenities), but government spending on this sector is 1 per cent. For donors, the numbers are difficult to calculate because much of water and sanitation spending come under the same category in the aid spending classification. Spending on water could range between 0 and over 9 per cent (the chart takes the average).

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