

# Samaritan Agents?

## On the delegation of aid policy\*

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### Abstract

Should an aid donor delegate the responsibility for allocating its budget to an agent less averse to inequality than itself in order to alleviate the Samaritan's Dilemma it is facing? Despite the intuitive appeal of this proposition, I show that the optimal type of agent depends on whether or not committing to a greater share for recipients where the productivity of aid is low is efficiency-enhancing. This is the case for donors not too concerned with redistribution. They would therefore benefit from delegating the determination of the discretionary allocation rule to agents more sensitive to distributional issues than themselves.

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## 1 Introduction

Donor countries distribute foreign aid to recipient countries in two main ways: directly or indirectly through intermediaries such as NGOs and the World Bank. Table 1 demonstrates that there is substantial variation in the importance of intermediaries in the allocation of aid among the member countries of the Development Assistance Committee (DAC) of the OECD. For example, whereas Canada disbursed 11% of its official development assistance (ODA) in 2001 through NGOs, five times the unweighted mean for the DAC countries, Australia's use of such agents was all but negligible. More than 70% of Italy's net disbursements went to multilateral institutions, while for Canada the share was only marginally above one-fifth. Subtracting contributions to NGOs from the

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bilateral share of ODA and adding it to the multilateral one, one arrives at a rough division of disbursements in terms of whether the responsibility for allocating the funds is delegated or not.<sup>1</sup> It may be seen that in terms of the share of total disbursements, intermediaries controlled about 35% of the total, which was about 52.3 billion USD.<sup>2</sup>

[Table 1 about here]

These figures demonstrate the importance of delegation in the distribution of foreign aid. How may we explain the patterns displayed in table 1? Most theoretical analyses of foreign aid concern a generic donor, with delegation not being an issue.<sup>3</sup> There are of course many possible reasons for delegating the responsibility for aid allocation to agents. Here I will focus on strategic incentives for delegation: as in many other contexts, delegating policy to an agent may allow donors to avoid problems of dynamic inconsistency. Specifically, delegation may help altruistic bilateral donors alleviate their Samaritan's Dilemma; the strategic adaptation of behaviour by recipient country governments in the expectation that donors will rush in to satisfy the needs that recipients leave unfulfilled.<sup>4</sup>

Svensson (2000a) find that delegating aid policy to an agent that is less inequality-oriented than themselves results in better outcomes from the perspective of bilateral donors. However, the figures in table 1 cast doubts over the explanatory power of his model. The substantial variation in delegation patterns suggest that a monotone relationship between donor and agent preferences is not empirically realistic. It is well-known from studies of aid allocation that on average bilateral aid is more driven by donor interests than by recipient needs, with the latter concerns more strongly present in the funding decisions of multilateral agencies.<sup>5</sup> This is because strategic and commercial interests loom

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<sup>1</sup>Woods (2000) claims that OECD statistics underestimate the role played by NGOs. The underestimation is due to the financing of service provision by NGOs at the request of bilateral aid agencies as well as the distribution of emergency aid through NGOs not being recorded as aid disbursed to NGOs. However, in order to analyse strategic delegation, which is the objective of this paper, the official figures are the right ones since the allocation of the categories of funds omitted is not at the discretion of the NGOs. As OECD statistics exclude bilateral transfers to the multilaterals for purposes predetermined by the former actors, the same argument applies to the numbers shown for multilateral aid.

<sup>2</sup>The shares of both NGOs and multilateral institutions have been increasing slightly over 1998-2001 (from 2% to 2.2% and from 32.9% to 33.1%, respectively).

<sup>3</sup>See e.g. Hagen (2000), Lahiri and Raimondos-Møller (2003), Pedersen (1996, 2001), and Svensson (2000a,b). A partial exception is Torsvik (2003), who studies whether two donors would benefit from cooperating. Azam and Laffont (2003) look at the role played by local NGOs in a developing country when a donor and the government engage in poverty alleviation, but only in their capacity as potential agents of the latter.

<sup>4</sup>The Samaritan's Dilemma was first laid out by Buchanan (1975), who sees it as a major problem of modern welfare states. Lindbeck and Weibull (1988) provide a formal and general analysis, noting in their conclusion that the relationship between aid donors and recipients might be studied within this framework. For actual applications of the Samaritan's Dilemma to foreign aid, see Pedersen (1996, 2001) and Svensson (2000a). Strictly speaking, altruism is only involved if the aid budget is endogenous (as in Pedersen 1996). However, similar dilemmas arise when donors care about several recipients and is to some extent concerned with distributional issues (as is the case in Pedersen 2001, Svensson 2000a, and in this paper).

<sup>5</sup>A non-exhaustive list of studies investigating the allocation patterns of various bilateral

large in the calculations of countries such as France, Japan, and the US. On the other hand, some small bilateral donors - in particular, the Scandinavian countries and the Netherlands - tend to concentrate their economic assistance in the poorest developing countries. Hence, they may be characterised as fairly averse to inequality among recipients. Based on Svensson (2000a) we would expect that these donors could benefit from delegating policy to a multilateral agency such as the World Bank. Many of the most influential member countries in the Bank have other concerns high on their agenda, making it likely that the allocation of its funds is less poverty-oriented than the one that for instance Norway or Sweden would have chosen had they distributed the money themselves. The numbers in table 1 are not inconsistent with such an explanation even though the shares of multilateral aid in the total ODA of the Scandinavian countries and the Netherlands tend to be below the DAC average in 2001.<sup>6</sup> But why would the US leave more than a quarter of its ODA in the care of multilateral agencies in which it has considerable less leeway to pursue its commercial and strategic interests, i.e., delegate responsibility for a substantial chunk of its aid budget to agents that must be judged more averse to inequality among recipient countries than itself? Similarly, why would France give almost 40% of its aid budget to multilaterals much less prone to display the same kind of favouritism towards its former colonies as it does in its bilateral assistance programme?

In this paper, I analyse a model where, depending on donor preferences, the optimal mandate of an agent could dictate either less or more inequality-aversion than the principal's own preferences. It shares the essential feature of the one studied by Svensson (2000a), namely, that there are two recipient countries locked in a competition for aid that weakens their incentives to improve their own lot as this results in a reduction in aid. The only important change is that the productivity of aid is allowed to vary between recipient countries. I show that it is not in general true that a donor would choose an agent that is less concerned with relative poverty than itself. In fact, for some parameter values, it is optimal to delegate policy responsibility to an agent that is more averse to inequality than the donor. The reason is that *ex post*, the allocation of aid tends to favour the recipient country where the productivity of aid is high. However, other things being equal investment is most valuable *ex ante* in the low-productivity recipient due to the large amount of aid that would be required in order to generate an equivalent increase in consumption. Therefore, it is optimal for donor types not too concerned about inequality to pick an agent that favours these countries more strongly than themselves, i.e., an agent that seeks to smooth consumption to a greater extent than such donors would if they

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and multilateral donors include Alesina and Dollar (2000), Boone (1996), Boschini and Olofsgård (2003), Cashel-Cordo and Craig (1997), Chauvet (2002), Maizels and Nissanke (1984), Rao (1997), and Rodrik (1995).

<sup>6</sup>As was pointed out in footnote 2, the average share of multilateral aid in the DAC countries has increased slightly over 1998-2001. The share of such aid in the total ODA of the Netherlands has fluctuated somewhat around the level attained in 2001 in this period while that of Norway has increased by a couple of percentage points. On the other hand, Denmark and Sweden have decreased the share of their budget reserved for the multilaterals notably during this period (by about four and six percentage points, respectively).

were in charge of executing policy.

The result derived by Svensson (2000a) obtains for donors that are relatively strongly motivated to smooth consumption differentials between recipients. Such donor types will benefit from choosing an agent more “conservative” than themselves as this will lead to a more efficient allocation of investment effort among recipients. In sum, the benefits from delegation stem from the possibility of alleviating some of the negative incentive effects of ex post aid allocation. The kind of agent that is optimal therefore depends whether or not it is efficiency-enhancing to stimulate more investment in the recipient where the productivity of aid is low than what would obtain if the donor’s own ex post allocation rule was applied.

The model is outlined in the next section, where the optimal aid allocation under commitment and the resulting investment in the recipient countries are presented as well. In section 3, similar results are derived for the case where the donor operates under discretion, i.e., allocates its aid budget after the recipients have made their investments. The delegation decision is analysed in section 4. Section 5 contains my concluding remarks.

## 2 The Model and a Benchmark

Consider the following three variants of a three-stage model, illustrated in table 2. If a donor can commit to an aid policy, i.e., a distribution of its budget between two recipients, the timing is as follows. In stage 1, the donor decides on its optimal policy. Fully aware of this policy, the recipients then choose a level of investment. In the final stage, the aid policy is executed. The equilibrium outcome in this regime, denoted by  $P$ , serves as a benchmark for evaluating the equilibrium of the second and more realistic case, when the donor cannot precommit its policy. It then chooses the allocation of its budget in stage 3. In stage 2 of regime  $D$ , the recipients simultaneously choose how much to invest, taking into account both the direct returns to investment and the indirect effects that investment has on total income in stage 3 through its impact on the allocation of aid. In the delegation regime ( $A$ ), the donor may delegate aid policy to a hand-picked agent prior to the recipients making their decisions. This means that the responsibility for allocating the donor’s fixed aid budget at stage 3 is left to the agent. In all other respects, this case is identical to the discretionary regime without delegation.

[Table 2 about here]

The donor’s preferences over the stage 3 consumption levels in two recipient countries,  $L$  and  $H$ , are

$$W_D = \sum_j U_D(C_j) = \begin{cases} \sum_j \frac{(C_j)^{1-\eta_D}}{1-\eta_D}, 0 < \eta_D < \infty, \eta_D \neq 1; \\ \sum_j \ln C_j, \eta_D = 1. \end{cases} \quad (1)$$

$\eta_D = -\frac{C_j U_{cc}}{U_c}$  is the elasticity of marginal utility. It is also a measure of the

degree to which the donor is concerned with the distribution of consumption between the two recipients. The higher  $\eta_D$  is, the stronger is the inclination to smooth differences in consumption levels, other things being equal. I will speak of this parameter as the donor's degree of inequality-aversion. The delegation decision that will be analysed below concerns whether a donor operating under discretion will find it in its interest to delegate aid policy to an agent with a mandate different from the preferences of the donor. Specifically, I will evaluate whether it is optimal to pick an agent for which  $\eta_A \neq \eta_D$ .<sup>7</sup>

The donor seeks to maximise this objective function subject to the following resource constraints

$$B_L + B_H \leq B; \quad (2a)$$

$$C_j = Y_j + \gamma_j B_j, j = L, H. \quad (2b)$$

(2a) just states that transfers to the two recipients cannot exceed the total aid budget, which is constant. (2b) expresses the consumption of each recipient as the sum of the income generated domestically,  $Y_j$ , and aid times the productivity of aid,  $\gamma_j$ . The productivity of aid, which is the marginal impact of aid on consumption, might differ between the two recipients. A number of factors could give rise to such differences. For example, corruption might be more widespread in one recipient than the other or the efficiency of public spending might be lower due to lower levels of bureaucratic capacity.<sup>8</sup>

In stage 2 of the game, recipients choose investment levels in order to maximise

$$V(E - I_j) + (Y_j + \gamma_j B_j). \quad (3)$$

That is, investment is financed from an endowment of  $E$  and generates a stage 3 domestic income of  $Y_j = f(I_j)$ , with  $f(I_j)$  being strictly increasing and concave.<sup>9</sup> Whereas stage 2 consumption is valued according to a strictly increasing and concave function  $V(\cdot)$ , stage 3 consumption enters the recipients' objective functions linearly. As the perceptive reader will have noticed, I assume that the donor does not care about the resources recipients spend in stage 2 ( $E - I_j$ ). One way to interpret this assumption is that the donor sees the amount not invested as wasted, perhaps because it is consumed by the elite of

<sup>7</sup>This is the same type of objective function that Svensson (2000a) uses to analyse this issue. The fact that  $\eta_D$  is constant of course simplifies the analysis of delegation and in the current context using this objective function has the added benefit of facilitating comparison with his results.

<sup>8</sup>Svensson (2000a) assumes decreasing returns to aid, with the relationship between aid and consumption being the same in the two recipient countries. While decreasing returns is probably a more realistic assumption than constant marginal effects of aid, it seems more likely than not that the impact of aid varies across recipients. The gain in analytical simplicity tips the balance in favour of switching assumptions from decreasing and identical effects of aid to constant but asymmetric.

<sup>9</sup>In contrast, income is exogenous but stochastic in Svensson (2000a) and the recipients instead exert "effort" that increases the probability of being in a state where income is high.

the recipient countries only. Pedersen (1996) uses a similar assumption in his analysis of aid and investment, the interpretation there being that the donor is only concerned with growth. It does not affect the results derived below as the objective functions of the donor and recipient governments also differ in Svensson (2000a). In any case, with two (or more) recipients divergence between the preferences of the donor and recipients seems realistic as one would not expect any one recipient country to care about consumption in the another, at least not to the same extent as a rich donor.

The assumption that recipients are risk-neutral is not crucial either. The formulation is chosen because it has two convenient implications. Firstly, it generates a clear-cut benchmark against which the discretionary equilibria with and without delegation may be evaluated. As I demonstrate shortly, the outcome is that there is no reduction in investment from receiving aid in the commitment regime. Other specifications of the objective-function will generate crowding-out of domestic investment by aid in the commitment case too, but as long as aid is given to supplement domestic incomes it will always be the case that the investment level is lower in the discretionary equilibrium. As will become apparent, the formulation chosen illustrates this in a very clear manner. The second benefit from assuming linearity in  $C_j$  is that the investment levels in the two recipient countries are not interdependent in the discretionary regime. This result is demonstrated in section 3.

When recipients make their choice after the donor has committed to some allocation  $\{B_L^P, B_H^P\}$ , it is readily apparent that their decision is unaffected by the distribution of aid. This is confirmed by the first-order condition for optimal investment, which is in this case

$$-V'(E - I_j) + f'(I_j) = 0, j = L, H. \quad (4)$$

The solution entails the same level of investment in both countries:  $I_j^P \equiv I^P$ ,  $j = L, H$ . The level of income generated domestically is therefore also identical and independent of the aid allocation.

When the donor makes its choice in stage 1, it is fully aware that its donations do not affect recipient country investment. Inserting the constraints (2a) and (2b) into the objective function and taking the derivative with respect to  $B_L$  yields the following first-order condition for an optimal aid allocation:<sup>10</sup>

$$\frac{\partial W_D}{\partial B_L} = (C_L)^{-\eta_D} \gamma_L - (C_H)^{-\eta_D} \gamma_H = 0. \quad (5)$$

From this condition, Proposition 1 follows:<sup>11</sup>

**Proposition 1**

a) If  $\gamma_L = \gamma_H$ , the optimal ex ante aid allocation is not a function of  $\eta_D$ . Hence,  $B_L^P = B_H^P = \frac{1}{2}B$ .

<sup>10</sup>In the main text, I concentrate on the case  $\eta_D \neq 1$ . The proofs of all Propositions and Lemmas are in the appendix.

<sup>11</sup>I assume that the aid budget is always large enough to ensure an interior solution, i.e., that  $B_j^P \geq 0$ ,  $j = L, H$  regardless of the level of  $Y^P$ . More precisely, I assume that  $B$  exceeds some critical value that depends on the parameters of the model.

b) If  $\gamma_L \neq \gamma_H$ , the optimal ex ante aid allocation is  $B_j^P = \Pi_j^P R^P - y_j^P, j = L, H$ , where  $\Pi_j^P$  is the optimal share of total available resources measured in aid equivalents,  $R^P = B + y_L^P + y_H^P$ , distributed to  $j$  and  $y_j^P = \frac{Y_j^P}{\gamma_j}$  is the domestic income of  $j$  measured in this way.

Part a) of the proposition states that if aid is equally productive in the two recipient countries, the degree of aversion to relative poverty does not matter for the optimal split of the aid budget. The reason is that then the donor would always want to equalise consumption levels, i.e., have  $C_L = C_H$ . Since the two recipients invest equally much in equilibrium and thus produce the same amount of aid equivalents, this in turn means that they should get half of the aid budget each.<sup>12</sup>

For the remainder of the paper I assume that  $\gamma_L < \gamma_H$ . That is, aid is more productive in terms of generating consumption in recipient country  $H$ . Part b) of the proposition then informs us that the optimal allocation depends on the degree of inequality aversion through  $\Pi_j^P$ , which is a function of  $\eta_D$ . As may be deduced directly from (5),  $\frac{C_H^P}{C_L^P} = \left(\frac{\gamma_H}{\gamma_L}\right)^{\frac{1}{\eta_D}}$ . Thus,  $H$  has the highest level of consumption regardless of the value of  $\eta_D$ .<sup>13</sup> However, the ratio  $\frac{C_H^P}{C_L^P}$  is smaller the higher  $\eta_D$  is, as the donor is then more willing to sacrifice some of the overall power of aid in terms of raising the combined consumption levels in the recipient countries in order to have a more equal distribution of consumption between them. In other words, the consumption share of  $L$  in terms of aid equivalents in the precommitment regime,  $\Pi_L^P$ , is increasing in  $\eta_D$ .<sup>14</sup> Moreover,  $\Pi_L^P \gtrless \frac{1}{2} \Leftrightarrow \eta_D \gtrless 1$ . For ease of reference, I state this as Lemma 1.

**Lemma 1**

- a)  $\frac{\partial \Pi_L^P}{\partial \eta_D} > 0$ ;
- b)  $\Pi_L^P \gtrless \frac{1}{2} \Leftrightarrow \eta_D \gtrless 1$ .
- c)  $\lim_{\eta_D \rightarrow 0} \Pi_L^P = 0$  and  $\lim_{\eta_D \rightarrow \infty} \Pi_L^P = \frac{\gamma_H}{\gamma_L + \gamma_H} > \frac{1}{2}$ .

Figure 1 illustrates Lemma 1.

**[Figure 1 about here]**

<sup>12</sup>This is the reason why Svensson (2000a) needs to assume that recipient countries potentially could be different ex post due to exogenous shocks. If recipients could not be asymmetric ex post, they would receive half the aid budget regardless of the inequality-aversion of the agency in charge of allocation and so delegation would not change anything. As I assume ex ante asymmetry from now on, ex post asymmetry does not add anything but notational complexity. I therefore disregard the possibility of recipients being hit by shocks.

<sup>13</sup>This is not the case in terms of aid equivalents.  $\frac{C_H^P/\gamma_H}{C_L^P/\gamma_L} = \frac{\Pi_H^P}{\Pi_L^P}$ . As will be demonstrated shortly in Lemma 1, if  $\eta_D > 1$   $\Pi_L^P > 0.5$  and so this ratio is less than one.

<sup>14</sup>Obviously,  $\Pi_H^P = 1 - \Pi_L^P$ , so that in the following we need only look at the share going to  $L$ .

### 3 Optimal Aid Policy under Discretion

We now turn to the case where the donor cannot precommit its aid policy. It is then chosen at stage 3 of the game, after the level of investment has been determined by the two recipients. Since the constraints are of the same form as in the precommitment case, it should be clear that the first-order condition for an optimal ex post distribution of the aid budget looks exactly the same as in the precommitment case. The only difference is that as recipients now are able to incorporate the effect of their investment on the distribution of aid, it will be evaluated at different levels of domestic incomes in these countries. That is, we will have  $R^D \neq R^P$ . Hence, we have Proposition 2

**Proposition 2**

The optimal ex post aid allocation is  $B_j^D = \Pi_j^D R^D - y_j^D, j = L, H$ .

It is important to note that the share of total available resources in terms of aid equivalents consumed by each recipient is the same as in the precommitment case:  $\Pi_j^D = \Pi_j^P \equiv \Pi_j^*$ . However, the effects of this allocation rule is now radically different. In essence, the recipients see the donor as “confiscating” their domestic incomes and returning a fraction of their combined incomes plus the aid budget. The optimal levels of consumption are

$$C_j^D = Y_j + \gamma_j B_j^D = \gamma_j \Pi_j^* R^D, j = L, H. \quad (6)$$

Hence,

$$\frac{\partial C_j^D}{\partial Y_j} = 1 + \gamma_j \frac{\partial B_j^D}{\partial Y_j} = \Pi_j^*, j = L, H. \quad (7)$$

That is, since  $\frac{\partial B_j^D}{\partial Y_j} = \frac{1}{\gamma_j} (\Pi_j^* - 1) < 0$ , recipients see themselves as collecting only a fraction of the stage 3 returns to investment. As long as  $\Pi_L^* \neq \frac{1}{2}$ , which is the case for  $\eta_D \neq 1$ ,  $L$  and  $H$  experience different aid-adjusted returns to investment and will therefore invest different amounts even though they are identical in all respects save the productivity of aid. The first-order condition for optimal investment is

$$-V'(E - I_j) + \Pi_j^* f'(I_j^D) = 0, j = L, H. \quad (8)$$

Unless  $\Pi_j^* = 1$ ,  $I_j^D < I_j^P, j = L, H$ . As was demonstrated in Lemma 1, we will always have an interior solution in terms of the consumption share of  $L$  measured in aid equivalents. Thus, there is underinvestment in both countries compared to the precommitment case. It follows that donors are worse off compared to the commitment regime: the relative distribution of consumption is the same, but the level of resources available is lower. This is the version of the Samaritan’s Dilemma the donor is facing here: its effort to increase the consumption levels of the recipient countries ex post undermines their own efforts. Each recipient is in effect taxed at a rate  $1 - \Pi_j^*$  through the aid allocation mechanism, a portion of the increase in domestic income generated by investment



being transferred to the other recipient country. Conscious of this, recipients reduce their investment levels, the result being that the level of resources available for consumption at stage 3 goes down. Naturally, the less they are “taxed”, the more they invest:  $\frac{dI_j^D}{d\Pi_j^*} = - \left[ \frac{f'(I_j^D)}{V''(E-I_j) + \Pi_j^* f''(I_j^D)} \right] > 0$ . However, as a greater share going to one recipient inevitably means less to the other  $y^D = y_L^D + y_H^D$  need not increase. To derive the properties of  $y^D$  with respect to  $\Pi_L^*$ , I assume that  $V(\cdot)$  has a constant elasticity of marginal utility,  $\mu$ , and that  $f(I_j) = \kappa I_j$ . Calculating  $I_j^D$  is then a straightforward exercise. Moreover, so is proving that  $y^D$  is a strictly concave function of  $\Pi_L^*$  with a maximum at<sup>15</sup>

$$\hat{\Pi} = \frac{(\gamma_H)^{\frac{\mu}{1+\mu}}}{(\gamma_L)^{\frac{\mu}{1+\mu}} + (\gamma_H)^{\frac{\mu}{1+\mu}}} \in \left( \frac{1}{2}, \frac{\gamma_H}{\gamma_L + \gamma_H} \right) \quad (9)$$

As already noted, aid is less productive in  $L$ , but the other side of that coin is that a unit gain in the domestic income of  $L$  generates a greater increase in  $y^D$  than a corresponding gain in  $Y_H$ . This is why  $\hat{\Pi} > \frac{1}{2}$ .

The effect on  $y^D$  is the change in efficiency from shifting responsibility to an agent with other distributional preferences. In the next section I will show that this effect decides the question of what kind of agent the donor would like to delegate aid policy to. I therefore summarise these important results in Proposition 3:

**Proposition 3**

$y^D$  is a strictly concave function of  $\Pi_L^*$  with a unique maximum at  $\hat{\Pi}$ .

Table 2 illustrates the relationship between the sum of domestic aid-equivalent incomes in the recipient countries in the discretionary regime measured in and the consumption share of the low-productivity country in terms of the same measuring rod.

[Figure 2 about here]

From this proposition and Lemma 1, the following useful result follows:

**Lemma 2**

$\exists 1 < \hat{\eta} < \infty$  such that  $\Pi_L^* = \hat{\Pi}$ .

That is, since the consumption share of  $L$  in terms of aid equivalents is a strictly increasing function of  $\eta_D$  with a value that is lower than 0.5 for  $\eta_D < 1$  and  $\hat{\Pi} \in \left( \frac{1}{2}, \frac{\gamma_H}{\gamma_L + \gamma_H} \right)$ , it must be the case that there is a donor type  $\hat{\eta} > 1$  that has preferences such that its optimal ex post distribution rule maximises the domestic incomes of the recipients.

We are now in a position to investigate whether a donor at stage 1 would like to leave the responsibility for allocating  $B$  in stage 3 to an agent with preferences that differ from its own.

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<sup>15</sup>This also allows me to derive an explicit expression for the income lost in the recipient countries due to the donor being unable to commit to an allocation rule before investments are made. It can be shown that  $y^P - y^D = \kappa^{\frac{\mu-1}{\mu}} \left[ \frac{(\Pi_L^*)^{-\frac{1}{\mu}-1}}{\gamma_L} + \frac{(\Pi_H^*)^{-\frac{1}{\mu}-1}}{\gamma_H} \right] > 0$ .

## 4 The Delegation Decision

In stage 1 of the game, the donor makes the delegation decision. That is, it decides whether to relieve itself of the task of executing aid policy in stage 3 by delegating the responsibility to an agent, and if so, what type of agent it would like to pick. The choice will be made knowing that the agent will be free to pursue an aid policy that satisfies its preferences. The solution will be an allocation of aid of the form shown in Propositions 1 and 2, with only the share of total available resources going to  $L$  being different. Since this share is monotonically increasing in  $\eta$ , the optimal mandate for an agent, which amounts to picking some  $\eta_A$ , can be reduced to deciding on  $\Pi_L^A$ . Therefore the donor's problem is

$$\text{Max}_{\Pi_L^A} W_D = \frac{(\gamma_L \Pi_L^A R^A)^{1-\eta_D}}{1-\eta_D} + \frac{(\gamma_H (1-\Pi_L^A) R^A)^{1-\eta_D}}{1-\eta_D}, \quad (10)$$

taking into account the fact that  $y^A$  is a function of  $\Pi_L^A$  through the effect it has on investment in stage 2.

The first-order condition for a maximum is

$$\begin{aligned} \frac{\partial W_D}{\partial \Pi_L^A} &= (C_L^A)^{-\eta_D} \frac{dC_L^A}{d\Pi_L^A} + (C_H^A)^{-\eta_D} \frac{dC_H^A}{d\Pi_L^A} = 0 \\ &\Leftrightarrow \left[ R^A + \Pi_L^A \frac{\partial y^A}{\partial \Pi_L^A} \right] + \left( \frac{\gamma_L}{\gamma_H} \right)^{\frac{\eta_D - \eta_A}{\eta_A}} \left[ (1 - \Pi_L^A) \frac{\partial y^A}{\partial \Pi_L^A} - R^A \right] = 0. \end{aligned} \quad (11)$$

Here I have made use of the fact that in stage 3,  $\frac{C_L^A}{C_H^A} = \left( \frac{\gamma_L}{\gamma_H} \right)^{\frac{1}{\eta_A}}$ . Note as well that changing  $\Pi_L^A$  has both a distributional effect and an effect on total available resources in stage 3. An increase in  $\Pi_L^A$  obviously entails a gain for recipient  $L$ , while  $H$  loses  $R^A$  at the margin. Whether the efficiency effect is positive or negative depends on the sign of  $\frac{\partial y^A}{\partial \Pi_L^A}$ .

The first-order condition may be rewritten as

$$\left( \frac{\eta_D - \eta_A}{\eta_A} \right) \ln \left( \frac{\gamma_L}{\gamma_H} \right) = \ln \left[ \frac{R^A + \Pi_L^A \frac{\partial y^A}{\partial \Pi_L^A}}{R^A - (1 - \Pi_L^A) \frac{\partial y^A}{\partial \Pi_L^A}} \right], \quad (12)$$

which implicitly defines  $\eta_{A^*}$ . From the results derived in the last section, we know that  $\frac{\partial y^A}{\partial \Pi_L^A} \geq 0 \Leftrightarrow \Pi_L^A \leq \hat{\Pi}$ . Lemma 2 informs us that there exists an  $\eta_A > 1$  such that  $\Pi_L^A = \hat{\Pi}$ . Stated differently, it says that there exists a donor type  $\hat{\eta} > 1$  such that  $\Pi_L^* = \hat{\Pi}$ . If such a donor evaluate the benefits from delegating to an agent with a different degree of inequality-aversion, it will note that at  $\eta_A = \hat{\eta}$ ,  $\Pi_L^A = \hat{\Pi}$ . Therefore  $\frac{\partial y^A}{\partial \Pi_L^A} = 0$  at this point, and so the right-hand side of (12) is zero. Then equality can only be obtained if  $\eta_A = \hat{\eta}$ .

Thus, such a donor type see no need to delegate the responsibility for aid policy. The intuition is that in order to benefit from delegation, the negative incentive effects of aid must be reduced. However, given that the agent will be operating under discretion, one can do no better than maximising the combined domestic income of the recipients. Since this is the case when  $L$  is given a consumption share in terms of aid equivalents of  $\hat{\Pi}$ , such a donor has nothing to gain from delegation.

For donor types less concerned with relative poverty than  $\hat{\eta}$ , starting at their true preferences it will be the case that  $\frac{\partial y^A}{\partial \Pi_L^A} > 0$ . This means that the expression in square brackets on the right-hand side is greater than 1, and so its logarithm is positive. Since  $\gamma_L < \gamma_H$ , the sign of the left-hand side is the negative of the sign of  $\frac{\eta_D - \eta_A}{\eta_A}$ . Therefore, at the optimum,  $\eta_D < \eta_{A^*}$ . In other words, the optimal agent is more concerned with poverty than the donor, not less. This is the exact opposite of the result derived by Svensson (2000a). In the context of this model, his result only obtains if  $\eta_D > \hat{\eta}$ . Then the donor is too concerned with inequality in the sense that it is possible to elicit greater “effort” by the recipients in the aggregate by delegating responsibility for aid policy to someone less inequality-averse than the donor. As the distortion of the distribution is negligible starting from  $\eta_A = \eta_D$  whereas the efficiency gain is of the first-order, it is optimal to for such donors to tie their hands by giving a more “conservative” agent the responsibility for allocating their aid budget ex post.

The second-order condition, which is examined in the appendix, confirms that we have found different maxima. Proposition 4 is therefore established:

**Proposition 4**

a) When  $\eta_D = \hat{\eta}$ , there are no benefits from strategically delegating aid policy to an agent with preferences different from the donor.

b) When  $\eta_D \neq \hat{\eta}$ , the donor will benefit from delegation. If  $\eta_D > \hat{\eta}$  ( $\eta_D < \hat{\eta}$ ) the optimal agent is less (more) concerned with inequality than the donor.

The intuition behind this proposition is that there is no point in delegating responsibility unless there is an efficiency gain. In and of itself, the ex post distribution is optimal for the donor given its preferences. The problem is that ex post allocation of aid generates negative incentive effects resulting in lower levels of investment than under commitment. When  $\eta_D \neq \hat{\eta}$  the total domestic income of the recipients is not maximised and so changing the allocation rule can have positive effects. The type of agent is determined by whether more redistribution towards  $L$  increases or reduces the amount of resources available in stage 3. Figure 2 illustrates that this depends on whether  $\eta_D \gtrless \hat{\eta}$ .

A final point to note is that delegation cannot achieve the commitment outcome. This is due to the fact that if competition for aid is not eliminated, negative incentive effects remain. And as long as the agent is operating under discretion, recipients take into account that their stage 3 consumption levels are interdependent due to the aid allocation mechanism. Hence, investment levels will still be below those attained in the commitment regime for both recipients. It follows that donors are still worse off compared to what they could achieve

with the ex ante optimal policy. A donor of type  $\hat{\eta}$  cannot improve on  $W_D^D$ , the level of its objective function attained in the discretionary regime without delegation. As noted in section 3, this is clearly lower than  $W_D^P$  as the relative distribution of consumption is the same in the two regimes while  $y^D < y^P$  so that there are less resources available for consumption in stage 3. Donor types for which  $\eta_D \neq \hat{\eta}$  can improve on  $W_D^D$  through strategic delegation, but still cannot reach  $W_D^P$ :  $L$ 's share of total consumption measured in aid equivalents is no longer equal to  $\Pi_L^*$  and  $y^A < y^P$ .

## 5 Conclusions and Extensions

It is known from analyses of the Samaritan's Dilemma in the context of aid that the intervention of an altruistic donor might produce counterproductive effects through strategic recipient behaviour. Svensson (2000a) has suggested that the problem might be alleviated by delegating aid policy to an agent that is less inequality-averse than the donor. This result is intuitive, and, moreover, in line with other delegation results in political economy, e.g. the benefits from delegating monetary policy to a central bank that cares relatively less about unemployment and more about inflation than society does. I show that in the simple model used here, the result of Svensson (2000a) does not apply for at least some parameter values. That is, some donor types would like to delegate aid policy to an agent that is more averse to relative poverty than themselves because this will spur investment in the recipient country where the productivity of aid is the lowest and therefore increases in domestic income are most valuable *ceteris paribus*. The types of donors that would like to have a "conservative" agent of the type described by Svensson (2000a) are those that are too inequality-averse in the sense that it is possible to increase the combined domestic incomes of the recipients by delegating to someone less sensitive to relative poverty.

The differences in results derive from the fact that whereas I assume that recipients are different, he assumes that they are identical except possibly for being hit by different exogenous income shocks. In his model, the negative incentive effects of ex post aid allocation stem from the fact that in states of the world where recipients are hit by asymmetric shocks, the donor smooths the consumption differential, thereby decreasing the incentives for both recipients to exert "effort" to increase the probability of being in a state where income is high. Thus, incentives can be improved for both recipients by committing to being less responsive to consumption differentials ex post. In my model, incentives can necessarily only be improved for one of the two recipients. For example, if the donor delegates aid policy to an agent that is less concerned with inequality than itself, the optimal level of investment for the recipient where the productivity of aid is low goes down. The optimal mandate for an agent depends on the direction in which investment effort has to be shifted in order to result in a higher level of total domestic incomes in the recipient countries compared to the donor's own ex post allocation rule. Regardless, the aggregate gain will

be the result of stronger effort in one recipient more than outweighing weaker effort in the other. Thus, the economic intuition only depends on the returns to aid being different across recipients, which seems a reasonable assumption.

There are two interesting extensions that I plan to pursue: Firstly, to take into account that in reality delegation of aid policy is not completely analogous to, say, delegation of monetary policy in that the principal is not free to pick an optimal agent. There are potential agents available, NGOs and multilateral agencies, but none of these can in general be expected to approximate the optimal agent from the viewpoint of a bilateral donor. In combination with the fact that in practice one can delegate responsibility for part of the budget, this may result in a combination of delegated and non-delegated aid being optimal, which seems to be what the data in table 1 really suggests. Secondly, analysing the case where a group of donors consider delegating aid allocation to a common agent, i.e., a multilateral agency. One would then have a starting point for analysing both the positive and the normative aspects of bilateral versus multilateral aid, which could have important implications for how the system of international aid should be organised.

## 6 Appendix

This appendix contains the proofs of the propositions and lemmas in the main text.

### *i) Proof of Proposition 1*

Combining the constraints and inserting the result into the objective function, the maximisation problem concerns one variable only, say,  $B_L^P$ . The first-order condition for the case where  $\eta_D \neq 1$  is

$$\frac{\partial W_D}{\partial B_L} = (C_L^P)^{-\eta_D} \frac{\partial C_L^P}{\partial B_L^P} + (C_H^P)^{-\eta_D} \frac{\partial C_H^P}{\partial B_L^P} = 0. \quad (\text{A1})$$

As  $\frac{\partial C_L^P}{\partial B_L^P} = \gamma_L$  and  $\frac{\partial C_H^P}{\partial B_L^P} = -\gamma_H$ , (5) obtains. Part a) concerns the special case  $\gamma_L = \gamma_H$ . Then the first-order condition reduces to  $C_L^P = C_H^P$ . Since the two recipients invest the same amount in this regime and thus have the same levels of domestic income,  $B_L^P = B_H^P = \frac{1}{2}B$  when the productivity of aid is identical.

The solution to part b) starts from  $\frac{C_H^P}{C_L^P} = \left(\frac{\gamma_H}{\gamma_L}\right)^{\frac{1}{\eta_D}}$ . Using  $B_H^P = B - B_L^P$ , defining  $\Pi_j^P = \frac{(\gamma_j)^{\frac{1-\eta_D}{\eta_D}}}{(\gamma_L)^{\frac{1-\eta_D}{\eta_D}} + (\gamma_H)^{\frac{1-\eta_D}{\eta_D}}}$ , and rewriting domestic incomes in terms of aid equivalents one arrives at the aid allocation functions  $B_j^P = \Pi_j^P R^P - y_j^P$ .

### *ii) Proof of Lemma 1*

The lemma most easily proved by calculating the effect of  $\eta_D$  on  $\Psi = \frac{\Pi_L^P}{1-\Pi_L^P} = \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{1-\eta_D}{\eta_D}}$ , which is increasing in  $\Pi_L^P$ . Taking logs, one finds that  $\frac{1}{\Psi} \frac{\partial \Psi}{\partial \eta_D} = -\frac{1}{(\eta_D)^2} \ln\left(\frac{\gamma_L}{\gamma_H}\right)$ , which is positive since  $\gamma_L < \gamma_H$ . Hence,  $\frac{\partial \Pi_L^P}{\partial \eta_D} > 0$  and part

a) is proven. As  $\eta_D \rightarrow 1$ , it may be seen that  $\Psi \rightarrow 1$ . Accordingly,  $\Pi_L^P \rightarrow \frac{1}{2}$ . In combination with  $\frac{\partial \Pi_L^P}{\partial \eta_D} > 0$ , this means that  $\Pi_L^P \gtrless \frac{1}{2} \Leftrightarrow \eta_D \gtrless 1$ , concluding the proof of part b). The limit of  $\ln \Psi$  as  $\eta_D \rightarrow 0$  is  $-\infty$ , demonstrating that  $\text{Lim}_{\eta_D \rightarrow 0} \Psi = 0 \Leftrightarrow \text{Lim}_{\eta_D \rightarrow 0} \Pi_L^P = 0$ . A similar exercise shows that  $\text{Lim}_{\eta_D \rightarrow \infty} \Pi_L^P = \frac{\gamma_H}{\gamma_L + \gamma_H}$ . Hence,  $\Pi_L^P \in \left(0, \frac{\gamma_H}{\gamma_L + \gamma_H}\right) \forall \eta_D \in (0, \infty)$ .

iii) *Proof of Proposition 2*

In the precommitment case,  $B_j$  only affects  $C_j$  directly because the recipients see the aid accruing to them as fixed when they make their investment decision. When the donor operates under discretion, it moves after the investment decisions have been made and so it treats the investment levels as fixed. The result is that the first-order condition for an optimal aid allocation is identical to (A1) with the exception of the levels of domestic income in the recipient countries. However, the fact that investment levels in the recipient countries go down has no effect on the distribution of consumption desired by the donor. That is, it is still the case that  $\frac{C_H^P}{C_L^P} = \left(\frac{\gamma_H}{\gamma_L}\right)^{\frac{1}{\eta_D}}$ , and so the share of total available resources consumed by each recipient is the same as in the precommitment regime. For future reference, denote the common share of  $L$  when the donor allocates aid according to its own preferences by  $\Pi_L^*$ .

iv) *Proof of proposition 3*

With the assumptions on preferences and technology made in the main text,  $I_j^D = E - (\kappa \Pi_j^*)^{-\frac{1}{\mu}}$ . One then arrives at  $y^D = y^* - \kappa \left[ \frac{(\kappa \Pi_L^*)^{-\frac{1}{\mu}}}{\gamma_L} + \frac{(\kappa \Pi_H^*)^{-\frac{1}{\mu}}}{\gamma_H} \right]$ , where  $y^* = \left(\frac{\kappa E}{\gamma_L} + \frac{\kappa E}{\gamma_H}\right)$  is the level of combined income attained by the recipients if they both invest their endowments. Taking the first and second derivatives of this expression demonstrates that  $y^D$  is a function that has a unique global maximum at  $\Pi_L^* = \frac{(\gamma_H)^{\frac{1}{1+\mu}}}{(\gamma_L)^{\frac{1}{1+\mu}} + (\gamma_H)^{\frac{1}{1+\mu}}} \equiv \hat{\Pi}$ . Since  $\gamma_H > \gamma_L$ ,  $\hat{\Pi} \in \left(\frac{1}{2}, \frac{\gamma_H}{\gamma_L + \gamma_H}\right)$ .

v) *Proof of Lemma 2*

By Lemma 1,  $\frac{\partial \Pi_L^*}{\partial \eta_D} > 0$  and  $\Pi_L^* \gtrless \frac{1}{2} \Leftrightarrow \eta_D \gtrless 1$ . As was just demonstrated,  $\hat{\Pi} > \frac{1}{2}$ . It follows that  $\exists \eta_D > 1$  such that  $\Pi_L^* = \hat{\Pi}$ . I denote this specific value of the degree of inequality-aversion by  $\hat{\eta}$ .

vi) *Proof of Proposition 4*

The first line of (11) in the main text contains the derivatives  $\frac{dC_L^A}{d\Pi_L^A}$  and  $\frac{dC_H^A}{d\Pi_L^A}$ . From (6) one obtains

$$\frac{dC_L^A}{d\Pi_L^A} = \gamma_L R^A + \gamma_L \Pi_L^A \frac{\partial R^A}{\partial \Pi_L^A}; \quad (\text{A2a})$$

$$\frac{dC_H^A}{d\Pi_L^A} = -\gamma_H R^A + \gamma_H (1 - \Pi_L^A) \frac{\partial R^A}{\partial \Pi_L^A}. \quad (\text{A2b})$$

Now  $\frac{\partial R^A}{\partial \Pi_L^A} = \frac{\partial y^A}{\partial \Pi_L^A}$  since the aid budget is given. Using  $\frac{C_L^A}{C_H^A} = \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{1}{\eta_A}}$ , we may therefore rewrite the first-order condition as

$$(C_L^A)^{-\eta_D} \gamma_L \left\{ \left[ R^A + \Pi_L^A \frac{\partial y^A}{\partial \Pi_L^A} \right] + \left( \frac{\gamma_L}{\gamma_H} \right)^{\frac{\eta_D - \eta_A}{\eta_A}} \left[ (1 - \Pi_L^A) \frac{\partial y^A}{\partial \Pi_L^A} - R^A \right] \right\} = 0. \quad (\text{A3})$$

It follows that at the optimum, the expression in curly brackets must be zero. This results in (12). The second derivative of the donor's objective function with respect to  $\Pi_L^A$  is

$$\begin{aligned} \frac{\partial^2 W_D}{\partial (\Pi_L^A)^2} &= -\eta_D (C_L^A)^{-\eta_D - 1} \left( \frac{dC_L^A}{d\Pi_L^A} \right)^2 - \eta_D (C_H^A)^{-\eta_D - 1} \left( \frac{dC_H^A}{d\Pi_L^A} \right)^2 \\ &\quad + (C_L^A)^{-\eta_D} \frac{d^2 C_L^A}{d(\Pi_L^A)^2} + (C_H^A)^{-\eta_D} \frac{d^2 C_H^A}{d(\Pi_L^A)^2} \end{aligned} \quad (\text{A4})$$

The first two terms can be seen to be negative. The second-order derivatives of stage 3 consumption with respect to the share allocated to  $L$  are

$$\frac{d^2 C_L^A}{d(\Pi_L^A)^2} = \gamma_L \left( 2 \frac{\partial y^A}{\partial \Pi_L^A} + \Pi_L^A \frac{\partial^2 y^A}{\partial (\Pi_L^A)^2} \right); \quad (\text{A5a})$$

$$\frac{d^2 C_H^A}{d(\Pi_L^A)^2} = \gamma_H \left( (1 - \Pi_L^A) \frac{\partial^2 y^A}{\partial (\Pi_L^A)^2} - 2 \frac{\partial y^A}{\partial \Pi_L^A} \right). \quad (\text{A5b})$$

By the definition of  $\hat{\eta}$   $\frac{\partial y^A}{\partial \Pi_L^A} = 0$  when  $\eta_A = \hat{\eta}$ . We also know that  $\frac{\partial^2 y^A}{\partial (\Pi_L^A)^2} < 0$ . Thus, for  $\eta_{A*} = \eta_D = \hat{\eta}$  the second-order condition for a maximum holds. For  $\eta_{A*} \neq \eta_D$ ,  $\frac{\partial y^A}{\partial \Pi_L^A} \neq 0$ . Using (A5a) and (A5b) as well as  $\frac{C_L^A}{C_H^A} = \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{1}{\eta_A}}$ , the last two terms of (A4) may be written as

$$\gamma_L (C_L^A)^{-\eta_D} \left\{ \left[ \Pi_L^A + \left( \frac{\gamma_L}{\gamma_H} \right)^{\frac{\eta_D - \eta_A}{\eta_A}} (1 - \Pi_L^A) \right] \frac{\partial^2 y^A}{\partial (\Pi_L^A)^2} + 2 \frac{\partial y^A}{\partial \Pi_L^A} \left[ 1 - \left( \frac{\gamma_L}{\gamma_H} \right)^{\frac{\eta_D - \eta_A}{\eta_A}} \right] \right\} \quad (\text{A6})$$

For  $\eta_D < \eta_{A*}$ , the expression in the second square bracket is negative. At the same time,  $\frac{\partial y^A}{\partial \Pi_L^A} > 0$ . When  $\eta_D > \eta_{A*}$ ,  $1 - \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{\eta_D - \eta_A}{\eta_A}} > 0$  while  $\frac{\partial y^A}{\partial \Pi_L^A} < 0$ . So it is unambiguous that  $\frac{\partial^2 W_D}{\partial (\Pi_L^A)^2} < 0$ .

*Notes on the logarithmic case*

When  $\eta_D = 1$ , (A1) becomes  $\frac{1}{C_L^P}\gamma_L - \frac{1}{C_H^P}\gamma_H = 0$ . It is straightforward to calculate that now  $B_j^P = \frac{1}{2}R^P - y_j^P$ . Of course, it is still the case that  $B_j^P = B_j^D$ . At  $\eta_A = \eta_D$ , where  $\Pi_L^A = 0.5$  and  $\frac{\partial y^A}{\partial \Pi_L^A} > 0$  (c.f. Proposition 3),  $\frac{\partial W_D}{\partial \Pi_L^A} = (C_L^A)^{-1} \frac{dC_L^A}{d\Pi_L^A} + (C_H^A)^{-1} \frac{dC_H^A}{d\Pi_L^A} = \frac{2}{R^A} \frac{\partial y^A}{\partial \Pi_L^A} > 0$ . So, as for other values of  $\eta_D$  below  $\hat{\eta}$ , it is indeed the case that a donor having such preferences would like to delegate aid policy to an agent with a mandate more sensitive to relative poverty than the donor's own discretionary policy would be.

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Table 1: % of Total Net Disbursements of ODA, 2001

Country	1. Bilateral ODA	2. To NGOs	3. To Multilateral Institutions	4. Delegated aid (2+3)	5. Non- delegated aid (1-2)
Australia	75.7	0.1	24.3	24.4	75.6
Austria	64.1	0.3	35.9	36.2	63.8
Belgium	57.9	0.6	42.1	42.7	57.3
Canada	78.3	11.0	21.7	32.7	67.3
Denmark	63.3	0.6	36.7	37.3	62.7
Finland	57.7	1.1	42.3	43.4	56.6
France	61.8	0.6	38.2	38.8	61.2
Germany	57.2	.	42.8	.	.
Greece	40.9	.	59.1	.	.
Ireland	64.3	9.6	35.7	45.3	54.7
Italy	27.2	5.2	72.8	78.0	22.0
Japan	75.7	1.8	24.3	26.1	73.9
Luxembourg	75.2	0.6	24.8	25.4	74.6
Netherlands	70.1	9.8	29.9	39.7	60.3
New Zealand	75.9	4.4	24.1	28.5	71.5
Norway	69.9	.	30.1	.	.
Portugal	68.3	0.6	31.7	32.3	67.7
Spain	66.2	0.3	33.8	34.2	65.8
Sweden	72.3	5.1	27.7	32.8	67.2
Switzerland	71.0	3.6	29.0	32.6	67.4
UK	57.3	4.1	42.7	46.9	53.1
USA	72.5	.	27.5	.	.
<b>DAC Average</b>	<b>66.9</b>	<b>2.2</b>	<b>33.1</b>	<b>35.3</b>	<b>64.7</b>

Source: Author's calculations based on data from the DAC (2002).

Note: . denotes missing information.

Table 2: Order of Moves in Different Regimes

Stage/Regime	<i>P</i>	<i>D</i>	<i>A</i>
1	Aid policy determined	Not applicable	Agent selected
2	Investment simultaneously chosen in recipient countries	Investment simultaneously chosen in recipient countries	Investment simultaneously chosen in recipient countries
3	Aid policy executed by donor	Aid policy determined and executed by donor	Aid policy determined and executed by agent

Figure 1:  $P_L$  as a function of  $h_D$ .

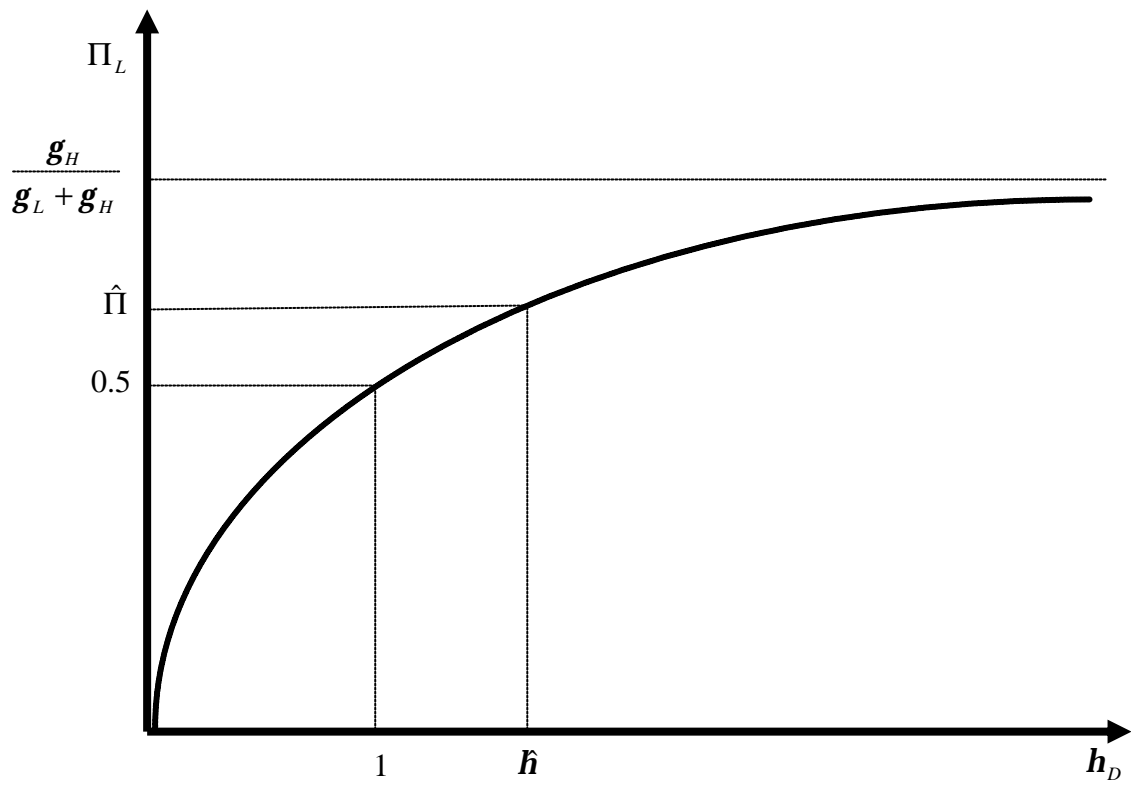


Figure 2:  $y^D$  as a function of  $P_L$ .

