Samaritan Agents?
On the delegation of aid policy*

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Abstract

Should a donor delegate the responsibility for allocating its aid budget to a less inequality-averse agent to alleviate the consequences of the Samaritan's Dilemma it is facing? I show that when aid impact differs across recipients the optimal type of agent depends on whether or not committing to a greater share for countries where the productivity of aid is low raises the combined domestic incomes of recipients. This is the case for donors too concerned with efficiency ex post. They therefore delegate the decision on the discretionary aid 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 members of the Development Assistance Committee (DAC) of the OECD. Subtracting contributions to NGOs from the bilateral share of official development assistance (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.[1] It

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[1] 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 bi-

may be seen that in terms of the share of total disbursements, intermediaries controlled approximately 35% of the total, which was about 52.3 billion USD.

[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 consider a generic donor, with delegation not being an issue.[2] There are of course many possible reasons for delegating the responsibility for aid allocation to agents. I will focus on strategic incentives for delegation: as in various other contexts, delegating policy to an agent may reduce problems of dynamic inconsistency. Altruistic bilateral donors face a Samaritan's Dilemma due to the strategic adaptation of recipient country governments expecting donors to rush in to satisfy any needs left unfulfilled.[3] Delegation may help alleviate the consequences of such behaviour.

Svensson (2000a) finds that choosing 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. It is well-known from studies of aid allocation that on average bilateral aid is more driven by donor interests than recipient needs, with the latter concerns more strongly present in the funding decisions of multilateral agencies.[4] This is because strategic and commercial interests loom 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 on the poorest developing countries. Hence, they may be characterised as fairly averse to inequality among recipients. Based on Svensson (2000a), we would expect these donors to benefit from delegating policy to a multilateral agency such as the World Bank. Many of the the Bank's most influential member countries

lateral 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.

[2] 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.

[3] The Samaritan's Dilemma was first laid out by Buchanan (1975), who considers it a major problem in 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 are to some extent concerned with distributional issues (as in Pedersen 2001, Svensson 2000a, and here).

[4] A non-exhaustive list of studies on this issue include Alesina and Dollar (2000), Boone (1996), Boschini and Olofsgård (2003), Cashel-Cordo and Craig (1997), Chauvet (2002), Maizels and Nissanke (1984), and Rodrik (1995).

have other concerns higher on their agenda, making it likely that the allocation of its funds is less poverty-oriented than the one that these countries would have chosen had they distributed the money themselves. 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 recipients than itself? Put simply: Svensson (2000a) cannot explain why both the Nordics and the US delegate to the World Bank.

In this paper, I analyse a model that 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 then not always the case that donors will choose an agent that is less concerned with relative poverty than themselves. In fact, for some donors the opposite is true. The reason is that ex post, the allocation of aid by such donors tends to favour the recipient country where the productivity of aid is high. However, this leads to a very low level of investment in the low-productivity recipient, where other things being equal investment is most valuable ex ante due to the large amount of aid that would be required 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 such countries more strongly than what is implied by their own ex post allocation rule, i.e., an agent that seeks to smooth consumption across recipients to a greater extent than such donors would if they were in charge of executing policy.

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, corresponding 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 the conclusion.

2 The Model and a Benchmark

Consider the following three variants of a three-stage game, illustrated in table 2. If a donor can commit to a distribution of its budget between two recipients before they act, 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 consumption 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 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 in recipient countries L and H are

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

$\eta_D = -\frac{C_j U_{cc}}{U_c}$ 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 η_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 issue at stake is 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, i.e., setting $\eta_A \neq \eta_D$.[5]

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

$$B_L + B_H \leq B; \tag{2a}$$
$$C_j = Y_j + \gamma_j B_j. \tag{2b}$$

($2a$) 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 income generated domestically, Y_j, and aid times the productivity of aid, γ_j. Assuming that the productivity of aid, which is the marginal impact of aid on consumption, might vary between the two recipients is the most important difference between the model analysed here and that of Svensson (2000a). A number of factors might give rise to variations in aid impact. 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. Thus, it seems a reasonable assumption to make.

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

$$V(E - I_j) + \left(Y_j + \gamma_j B_j\right). \tag{3}$$

[5] This is the same type of objective function that Svensson (2000a) uses to analyse this issue. The fact that η_D is constant of course simplifies the analysis and in the current context using this objective function has the added benefit of facilitating comparison with his results.

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. Whereas stage 2 consumption is valued according to a strictly increasing and strictly 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 to 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 the recipient countries. Pedersen (1996) uses a similar assumption in his analysis of aid and investment, his interpretation 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 one recipient country to care about consumption in the other, at least not to the same extent as a rich donor.

The assumption that recipients are risk-neutral 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 in the commitment regime there is no reduction in investment from receiving aid. Other specifications of the objective-function will generate crowding-out of 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 investment 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 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 $\left\{B_L^P, B_H^P\right\}$, 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 in this case is

$$-V'(E - I_j) + f'(I_j) = 0. \tag{4}$$

The solution entails the same level of investment in both countries: $I_L^P = I_H^P \equiv I^P$. 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 $(2a - b)$ into the objective function and taking the derivative with respect to B_L yields the following first-order condition for an optimal aid allocation:[6]

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

[6] In the main text, I concentrate on the case $\eta_D \neq 1$. The proofs of all propositions and lemmas are in the appendix.

In interpreting this condition as well as the results that follow, it turns out to be useful to define the income levels of the recipients in aid-equivalents, i.e., make them commensurable with each other by expressing them in the same units as B. This can be done by dividing domestic income by the productivity of aid: $y_j = \frac{Y_j}{\gamma_j}$. Then we may write the total amount of resources available in stage 3 as $R = B + y_L + y_H$.

Using these definitions, Proposition 1 follows straightforwardly from (5):

Proposition 1

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

b) If $\gamma_L \neq \gamma_H$, the optimal ex ante aid allocation is $B_j^P = \Pi_j^P R^P - y_j^P$, where $\Pi_j^P \in (0,1)$ is the optimal aid-equivalent consumption share of j.

Part a) of the proposition states that if aid impact is the same in the two recipient countries, the degree of aversion to relative poverty does not matter for the optimal split of the aid budget. The donor would then always want to equalise consumption levels, i.e., have $C_L = C_H$. Since the recipients invest the same amount in equilibrium and thus have identical incomes, this in turn means that they should divide the aid budget evenly. This is the reason why Svensson (2000a) needs the twin assumptions that recipient countries might be different ex post due to exogenous shocks and that the returns to aid are strictly decreasing.[7] Otherwise, both 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. Moreover, while decreasing returns is probably a more realistic assumption than constant marginal effects of aid the gain in analytical simplicity when introducing variations in aid impact seems large enough for the latter assumption to be warranted.

Assuming $\gamma_L < \gamma_H$, 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 $\Pi_j^P = \frac{B_j^P + y_j^P}{R^P}$. Using (2$b$), $\Pi_j^P = \frac{C_j^P/\gamma_j}{R^P}$, i.e., it is the consumption share of j measured in aid-equivalents. The optimal value of Π_j^P is a function of η_D:

$$\Pi_j^P = \frac{(\gamma_j)^{\frac{1-\eta_D}{\eta_D}}}{(\gamma_L)^{\frac{1-\eta_D}{\eta_D}} + (\gamma_H)^{\frac{1-\eta_D}{\eta_D}}} \tag{6}$$

Obviously, $\Pi_H^P = 1 - \Pi_L^P$, so that in the following we need only look at the share going to L. L is disadvantaged by the fact that aid has a smaller impact on consumption there compared to H. If the donor cared only about efficiency ($\eta_D = 0$), H would get all the aid;[8] and only if the donor was infinitely averse to

[7] Income is exogenous but stochastic in Svensson (2000a), with the recipients exerting "effort" that increases the probability of being in a state where income is high.

[8] Actually, the result is stronger than this; if $\eta_D = 0$, the donor would like to set $C_L = 0$. But the donor cannot reduce C_L below Y_L without being able to tax L, which is unrealistic.

inequality would it equalise consumption in L and H when $\gamma_L < \gamma_H$. However, the higher the value of η_D, the greater the willingness of the donor to sacrifice some of the overall power of aid in raising the combined consumption levels in the recipient countries to have a more equal distribution of consumption between them. In other words, Π_L^P is increasing in η_D. Moreover, $\Pi_L^P \gtreqless \frac{1}{2} \Leftrightarrow \eta_D \gtreqless 1$.[9] For ease of reference, I state these observations as Lemma 1.

Lemma 1

a) $\frac{\partial \Pi_L^P}{\partial \eta_D} > 0$;

b) $\Pi_L^P \gtreqless \frac{1}{2} \Leftrightarrow \eta_D \gtreqless 1$.

c) $Lim_{\eta_D \to 0} \Pi_L^P = 0$ and $Lim_{\eta_D \to \infty} \Pi_L^P = \frac{\gamma_H}{\gamma_L + \gamma_H} > \frac{1}{2}$.

Figure 1 illustrates Lemma 1.

[Figure 1 about here]

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 investment levels have 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 B looks exactly the same as that for the ex ante distribution. The only difference is that it will be evaluated at different levels of domestic incomes in these countries, as recipients now are able to incorporate the effect of their investment on the distribution of aid. That is, we will have $R^D \neq R^P$. Hence, we have Proposition 2

Proposition 2

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

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

$$C_j^D = Y_j + \gamma_j B_j^D = \gamma_j \Pi_j^* R^D. \tag{7}$$

Hence,

Thus, there is a lower bound on Π_L^P that needs to be satisfied in order to have an interior solution. $B_L^P \geq 0 \Leftrightarrow \Pi_L^P \geq \frac{y_L^P}{R^P}$, i.e., the optimal consumption share must be at least as large as the share of available resources generated by L. Since I assume $\eta_D > 0$, $\Pi_L^P > 0 \; \forall \eta_D$. Hence, for a large enough value of B this condition is always satisfied.

[9] 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, for any $\eta_D \in (0, \infty)$ H has the highest level of consumption. However, this is not necessarily the case in terms of aid equivalents: $\frac{C_H^P/\gamma_H}{C_L^P/\gamma_L} = \frac{1-\Pi_L^P}{\Pi_L^P}$. If $\eta_D > 1$ $\Pi_L^P > 0.5$, and so this ratio is less than one.

$$\frac{\partial C_j^D}{\partial Y_j} = 1 + \gamma_j \frac{\partial B_j^D}{\partial Y_j} = \Pi_j^* < 1. \tag{8}$$

That is, since $\frac{\partial B_j^D}{\partial Y_j} = \frac{1}{\gamma_j}\left(\Pi_j^* - 1\right) < 0$, 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 now

$$-V'\left(E - I_j\right) + \Pi_j^* f'\left(I_j^D\right) = 0. \tag{9}$$

Because $\Pi_j^* < 1$, $I_j^D < I^P$. Thus, there is underinvestment in both countries compared to the precommitment case. It follows that the donor is worse off: the relative distribution of consumption is the same, but the amount of resources available is lower ($R^D < R^P$). This is the version of the Samaritan's Dilemma it is facing here: its effort to increase consumption in 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. Conscious of this, recipients reduce their investment, the result being that the amount of resources available for consumption at stage 3 is reduced. Naturally, the less they are "taxed", the more they invest: $\frac{dI_j^D}{d\Pi_j^*} = -\left[\frac{f'\left(I_j^D\right)}{V''(E-I_j)+\Pi_j^* f''\left(I_j^D\right)}\right] > 0$. 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 Π_L^*, I assume that $V(\cdot)$ has a constant elasticity of marginal utility, μ, 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 Π_L^* with a maximum at

$$\widehat{\Pi} = \frac{\left(\gamma_H\right)^{\frac{\mu}{1+\mu}}}{\left(\gamma_L\right)^{\frac{\mu}{1+\mu}} + \left(\gamma_H\right)^{\frac{\mu}{1+\mu}}} \in \left(\frac{1}{2}, \frac{\gamma_H}{\gamma_L + \gamma_H}\right) \tag{10}$$

As already noted, aid is less productive in L, but the other side of the coin is that a unit gain in Y_L generates a greater increase in y^D than a corresponding gain in Y_H. This is why $\widehat{\Pi} > \frac{1}{2}$. At $\Pi_L^* = \frac{1}{2}$, $\frac{\partial I_L^D}{\partial \Pi_L^*} = \frac{\partial I_H^D}{\partial \Pi_H^*}$, but the fact that investment in L generates more aid-equivalents ceteris paribus means that the maximum is at $\frac{\partial I_H^D/\partial \Pi_H^*}{\partial I_L^D/\partial \Pi_L^*} = \frac{\gamma_H}{\gamma_L} > 1$. In other words, if the goal was to have as much resources as possible for distribution in stage 3, it would be desirable to have more investment in L than in H.

The change in y caused by changing Π_L is the efficiency-effect from shifting responsibility to an agent with different distributional preferences. In the next section I show that this determines the kind of agent the donor would like to delegate to. I therefore summarise these important results in Proposition 3:

Proposition 3
y^D is a strictly concave function of Π_L^* with a unique maximum at $\widehat{\Pi}$.

Figure 2 illustrates the relationship between the sum of domestic incomes in the recipient countries in the discretionary regime and the consumption share of the low-productivity country in terms of aid-equivalents.

[Figure 2 about here]

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

Lemma 2
$\exists \widehat{\eta} > 1$ such that $\Pi_L^* = \widehat{\Pi}$.

That is, since $\widehat{\Pi} > \frac{1}{2}$ and Π_L^* is a strictly increasing function of η_D with a value equal to 0.5 for $\eta_D = 1$, it must be the case that there is a donor type $\widehat{\eta} > 1$ that has preferences such that its optimal ex post distribution rule maximises the combined domestic incomes of the recipients.

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

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 η, deciding on the optimal mandate for an agent, η_{A*}, can be reduced to picking Π_L^A. Therefore, the donor's problem is

$$Max_{\Pi_L^A}\ W_D = \frac{\left(\gamma_L \Pi_L^A R^A\right)^{1-\eta_D}}{1-\eta_D} + \frac{\left(\gamma_H \left(1-\Pi_L^A\right) R^A\right)^{1-\eta_D}}{1-\eta_D}, \tag{11}$$

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

The first-order condition for a maximum is

$$\begin{aligned} \frac{\partial W_D}{\partial \Pi_L^A} &= \left(C_L^A\right)^{-\eta_D} \frac{dC_L^A}{d\Pi_L^A} + \left(C_H^A\right)^{-\eta_D} \frac{dC_H^A}{d\Pi_L^A} = 0 \\ &\Leftrightarrow \left[R^A + \Pi_L^A \frac{\partial y^A}{\partial \Pi_L^A}\right] + \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{\eta_D-\eta_A}{\eta_A}} \left[\left(1-\Pi_L^A\right) \frac{\partial y^A}{\partial \Pi_L^A} - R^A\right] = 0. \end{aligned} \tag{12}$$

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 Π_L^A has both a distributional effect and an effect on total available resources in stage 3. An increase in Π_L^A obviously entails a gain for 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

$$\left(\frac{\eta_D - \eta_A}{\eta_A}\right) \ln\left(\frac{\gamma_L}{\gamma_H}\right) = \ln\left[\frac{R^A + \Pi_L^A \frac{\partial y^A}{\partial \Pi_L^A}}{R^A - \left(1 - \Pi_L^A\right) \frac{\partial y^A}{\partial \Pi_L^A}}\right], \tag{13}$$

which implicitly defines η_{A*}. To interpret this condition, first recall that Lemma 2 informs us that there is a donor type $\widehat{\eta}$ for which $\Pi_L^* = \widehat{\Pi}$. If such a donor evaluates the benefits from delegating to an agent with a different degree of inequality-aversion, it will note that at $\eta_A = \eta_D$, $\Pi_L^A = \widehat{\Pi}$. At this point $\frac{\partial y^A}{\partial \Pi_L^A} = 0$, and so the right-hand side of (13) is zero. But at $\eta_A = \eta_D = \widehat{\eta}$ the left-hand side is also zero. Thus, this donor type sees no need to delegate. 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 y^A. Since this is the case when L is given a consumption share in terms of aid-equivalents of $\widehat{\Pi}$, a donor with these preferences has nothing to gain from delegation.

For donor types less concerned with relative poverty than this, 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 of (13) 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, $\eta_D < \eta_{A*}$. In other words, the optimal agent is more concerned with relative poverty than the donor, not less. The reason is that these donor types are "too concerned" about efficiency ex post, favouring H to an extent that makes it ex ante optimal to increase investment in L at the expense of investment in H by committing to a $\Pi_L^A > \Pi_L^*$.

This is the exact opposite of the result derived by Svensson (2000a). In the current context, his result only obtains if $\eta_D > \widehat{\eta}$. Such donors are "too inequality-averse" in the sense that it is possible to obtain a better distribution of investment effort between the recipients by delegating to an agent with a mandate that puts less emphasis on smoothing consumption differentials. As the distortion of the distribution of consumption is negligible starting from $\eta_A = \eta_D$ whereas the efficiency gain is of the first-order, it is optimal to for them to tie their hands by giving a more "conservative" agent the responsibility for allocating their budgets 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 $\eta_D = \widehat{\eta}$, there are no benefits from strategically delegating aid policy to an agent with preferences different from the donor.

b) When $\eta_D \neq \widehat{\eta}$, the donor will benefit from delegation. If $\eta_D > \widehat{\eta}$ ($\eta_D < \widehat{\eta}$) 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 a donor given its preferences. The problem is that discretionary allocation of aid generates negative incentive effects resulting in lower levels of investment than under commitment. Moreover, when $\eta_D \neq \widehat{\eta}$ the total domestic income of the recipients is not even maximised given the fact that aid is distributed ex post. Thus, changing the allocation rule can have positive effects. The type of agentchosen 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 $\eta_D \lesseqgtr \widehat{\eta}$.[10]

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 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 $\widehat{\eta}$ 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; while the relative distribution of consumption is the same in the two regimes, $y^D < y^P$ and so $C_L^D + C_H^D < C_L^P + C_H^P$. Donor types for which $\eta_D \neq \widehat{\eta}$ 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 not equal to Π_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 have counterproductive effects due to 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 the result of Svensson (2000a) does not always apply when aid effectiveness varies across recipients. Some donor types would then like to delegate aid policy to an agent that is more averse to relative poverty than themselves because

[10] It might be argued that the same factors that make for low aid effectiveness also reduces the effectiveness of domestic investment. It can be shown that this would not affect the results derived here. If $\kappa_H > \kappa_L$, it is still the case that y is a strictly concave function of Π_L. Moreover, whether $\widehat{\Pi}$ increases or decreases compared to the case $\kappa_H = \kappa_L$ depends on μ. The reason is that a higher marginal product of investment in H compared to L has two conflicting effects. On the one hand, it makes it desirable to shift investment from L to H, but on the other hand the marginal responsiveness of investment in H to changes in Π_H goes down. The net effect on $\widehat{\Pi}$ is thus not clear.

they are too concerned with efficiency ex post, making it possible to shift the consumption possibility frontier of the recipients outwards by strengthening the incentives for investment in the country where the productivity of aid is low.

The differences in results derive from the fact that whereas I assume that recipients are different, Svensson (2000a) 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 recipients by weakening the investment incentives of the other. Since most aid has historically been given to spur investment and growth, it seems more likely than not that such incentive trade-offs exists. In fact, aid tends to be procyclical, which is inconsistent with a story where the negative incentive effects are due to the countercyclicality of discretionary aid allocation.[11] Furthermore, in contrast to Svensson (2000a) I provide an explanation of why donors at the opposite sides of the spectrum when it comes to inequality-aversion - e.g. the US and the Nordics - delegate financial power to an agency such as the World Bank.

There are two interesting extensions that I plan to pursue. Firstly, 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 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 considers delegating to a common agent - a multilateral agency - seems fruitful. One would then have a starting point for anlysing 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 proofs of the propositions and lemmas in the main text.

i) Proof of Proposition 1

Combining the constraints $(2a - b)$ 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

[11] See Bulíř and Hamann (2003) and Pallage and Robe (2001) for evidence on the cyclical properties of aid. The only notable exception to their findings of procyclicality is food aid, which is of course given in response to negative shocks, but this is a minor part of total aid.

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

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 $(2a - b)$ and the definition of aid-equivalent income and defining Π_j^P as shown in (6), one arrives at the aid allocation functions $B_j^P = \Pi_j^P R^P - y_j^P$. QED.

ii) Proof of Lemma 1

The lemma is most easily proved by calculating the effect of η_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 Π_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 $\eta_D \to 1$, it may be seen that $\Psi \to 1$. Accordingly, $\Pi_L^P \to \frac{1}{2}$. In combination with $\frac{\partial \Pi_L^P}{\partial \eta_D} > 0$, this means that $\Pi_L^P \gtreqless \frac{1}{2} \Leftrightarrow \eta_D \gtreqless 1$, concluding the proof of part b). The limit of $\ln \Psi$ as $\eta_D \to 0$ is $-\infty$, demonstrating that $Lim_{\eta_D \to 0} \Psi = 0 \Leftrightarrow Lim_{\eta_D \to 0} \Pi_L^P = 0$. A similar exercise shows that $Lim_{\eta_D \to \infty} \Pi_L^P = \frac{\gamma_H}{\gamma_L + \gamma_H}$. Hence, $\Pi_L^P \in \left(0, \frac{\gamma_H}{\gamma_L+\gamma_H}\right) \forall \eta_D \in (0, \infty)$. QED.

iii) Proof of Proposition 2

In the precommitment case, B_j only affects C_j directly because the recipients see the aid given to them as fixed when they make their investment decisions. Under discretion, the donor moves after the recipients and so it treats investment as fixed. The result is that the first-order condition for an optimal aid allocation is identical to $(A1)$ in all respects except for y_L and y_L. However, the fact that domestic incomes are reduced has no effect on the distribution of consumption desired by the donor. 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 Π_L^*. QED.

iv) Proof of proposition 3

With the assumptions on preferences and technology made in the main text, $I_j^D = E - \left(\kappa \Pi_j^*\right)^{-\frac{1}{\mu}}$. 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 aid-equivalent 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 $\Pi_L^* = \frac{(\gamma_H)^{\frac{\mu}{1+\mu}}}{(\gamma_L)^{\frac{\mu}{1+\mu}} + (\gamma_H)^{\frac{\mu}{1+\mu}}} \equiv \widehat{\Pi}$. Since $\gamma_H > \gamma_L$,

$\widehat{\Pi} \in \left(\frac{1}{2}, \frac{\gamma_H}{\gamma_L+\gamma_H}\right)$. QED.

v) Proof of Lemma 2

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

vi) Proof of Proposition 4

The first line of (12) 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 (7) one obtains

$$\frac{dC_L^A}{d\Pi_L^A} = \gamma_L R^A + \gamma_L \Pi_L^A \frac{\partial R^A}{\partial \Pi_L^A}; \tag{A2a}$$

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

Now $\frac{\partial R^A}{\partial \Pi_L^A} = \frac{\partial y^A}{\partial \Pi_L^A}$ since B is constant. Moreover, the agent will allocate aid so that $\frac{C_L^A}{C_H^A} = \left(\frac{\gamma_L}{\gamma_H}\right)^{\frac{1}{\eta_A}}$. Using this result as well as $(A2a - b)$ to rearrange (12), it may be simplified into

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

It follows that at the optimum, the expression in curly brackets must be zero. This results in (13). The second derivative of W_D with respect to Π_L^A is

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

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

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

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

By definition $\eta_A = \widehat{\eta} \Leftrightarrow \frac{\partial y^A}{\partial \Pi_L^A} = 0$. We know that $\frac{\partial^2 y^A}{\partial \left(\Pi_L^A\right)^2} < 0$. Thus, for $\eta_{A*} = \eta_D = \widehat{\eta}$ 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 $(A5a-b)$ the sign of last two terms of $(A4)$ may be seen to be the same as the sign of

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

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 $\frac{\partial^2 W_D}{\partial \left(\Pi_L^A\right)^2} < 0$. QED.

Notes on the logarithmic case

When $\eta_D = 1$, $(A1)$ becomes $\frac{1}{C_L^P}\gamma_L - \frac{1}{C_H^P}\gamma_H = 0$. Then $B_j^P = \frac{1}{2}R^P - y_j^P$. Of course, it remains true 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), $\frac{\partial W_D}{\partial \Pi_L^A} = \left(C_L^A\right)^{-1}\frac{dC_L^A}{d\Pi_L^A} + \left(C_H^A\right)^{-1}\frac{dC_H^A}{d\Pi_L^A} = \frac{2}{R^A}\frac{\partial y^A}{\partial \Pi_L^A} > 0$. Moreover, $\frac{\partial^2 W_D}{\partial \left(\Pi_L^A\right)^2} = -\frac{2}{(R^A)^2}\left(\frac{\partial y^A}{\partial \Pi_L^A}\right)^2 + \frac{2}{R^A}\frac{\partial^2 y^A}{\partial \left(\Pi_L^A\right)^2} < 0$. So, as for other values of η_D below $\widehat{\eta}$, a donor for which $\eta_D = 1$ would like to delegate to an agent with a mandate $\eta_{A*} > \eta_D$. QED.

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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	.	.
DAC Average	**66.9**	**2.2**	**33.1**	**35.3**	**64.7**

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	*P*	*D*	*A*
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.

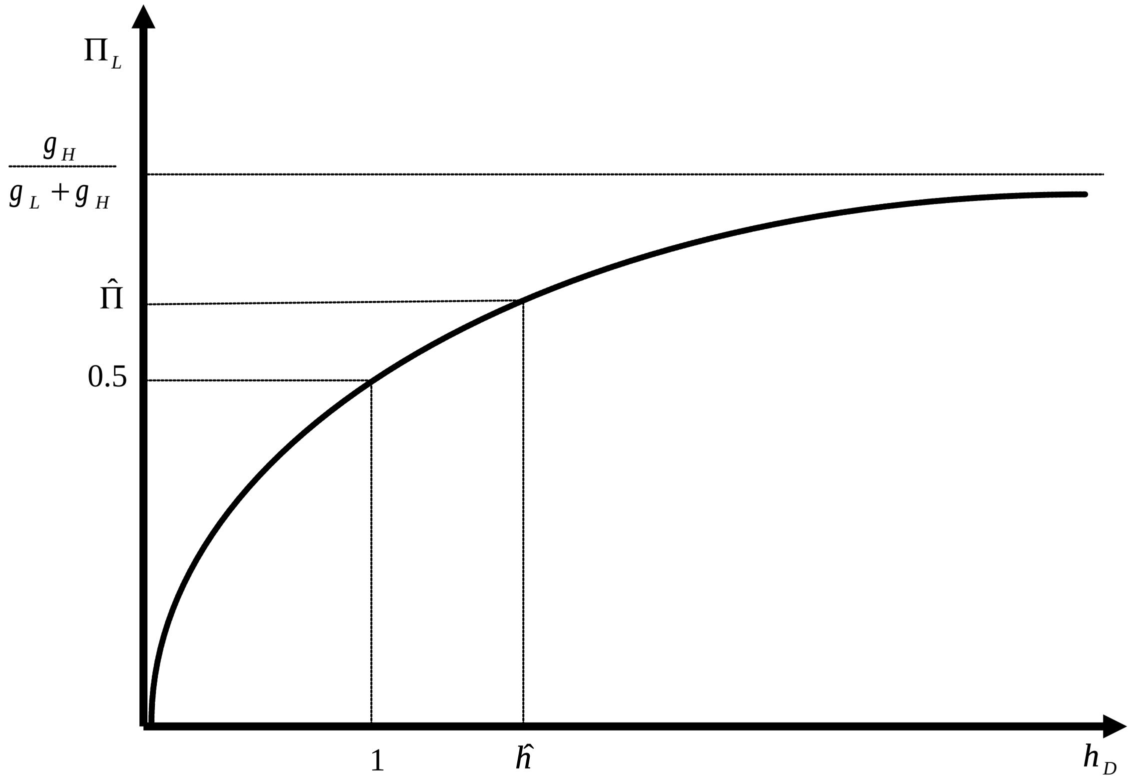

Figure 2: y^D as a function of P_L.