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**Foreign economic aid;
should donors cooperate?**

by

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Foreign economic aid; should donors cooperate?*

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Abstract

When several altruistic donors provide aid to alleviate poverty in another country, they face a common good problem. Solving this problem calls for cooperation and policy integration. But before we conclude in favour of cooperation, we should be aware that mutual aid might have negative effects on domestic policy in the receiving country. The more united and responsible donors act towards the poor in the receiving country, the less responsible does the receiving government act. I study these two countervailing effects of donor cooperation in different settings. I find that cooperation is always beneficial if aid can be provided with a complete contingent contract. If contracts cannot be used, I show that cooperation can be harmful. The most surprising result is that the negative effect of donor cooperation - the crowding out of domestic support to the poor - is less pronounced if donors face a Samaritan's dilemma.

1 The countervailing effects of cooperation

Do not consider a group of rich countries that independently provide economic aid to another country, in which a share of the population live in extreme poverty.

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Donors are "poverty averse"; they provide foreign economic aid to improve the living conditions for the poor in the deprived country. Should donors cooperate? Should they unite their poverty reducing effort and create one integrated aid organization (multilateral aid), or are they better off operating independently (bilateral aid)?

Providing foreign economic aid efficiently is a complicated and many-faceted problem. This paper makes no attempt to give a comprehensive evaluation of the costs and benefits of donor cooperation. It takes a rather narrow perspective and focuses on two issues that seem to be affected in opposite ways if donors cooperate.

If donors are, to some extent, altruists, as I assume they are, their welfare increase if the living standard of the poor in the receiving country improves. When one donor provide aid to alleviate poverty in the deprived country, this has a positive effect on all donors. Providing foreign economic aid to alleviate poverty is, in other words, a common good among donors. It is well known that individual contributions to a public good leads to under-provision of the good.¹ The common good aspect of poverty alleviation calls for cooperation among donors.

But before we conclude in favor of cooperation, we must assess another aspect of foreign economic aid, namely how help from the outside affects policy inside the receiving country. It has been argued that foreign economic aid has negative effects on domestic policy, e.g. that foreign aid has a tendency to reduce the receiving government's incentives to help its' own poor. Such agency problems arise naturally in the provision of foreign economic aid, where donors often hold different priorities than the government in the receiving country, and it is difficult, if not impossible, to use contracts to align interests. These incentive problems might be intensified if donors cooperate. It seems plausible that the more united and responsible donors act towards the poor in the receiving country, the less responsible does the receiving government act.

These two mechanisms indicate that cooperation among donors have counter-vailing effects on the consumption of the poor and on the welfare of the donors, one positive and one negative. To assess the overall impact of cooperation we need a

¹There is a large literature discussing the problem of underprovision in a Nash equilibrium where private individuals contribute towards a public good, see for example Bergstrom et. al (1986).

formal model.

Related problems and literature. Before we turn to the model, it is appropriate to say a few words about related literature. The topic of this paper is incentive problems in foreign economic aid. Incentive problems arise when there the donors and the receivers of aid have different interests. I focus on a situation where the providers of foreign economic aid has one single aim, namely to reduce poverty in the receiving countries, while poverty alleviation is only one of many concerns for the government in the receiving country. The problem then is that foreign initiatives to alleviate poverty crowds out domestic initiatives.² The situation gets really problematic if the donors altruism is strategically exploited by the receiving government. In this case the donors' face a policy dilemma known as the Samaritan's dilemma. For a general discussion of this problem see, Buchanan (1975), Bruce and Waldman (1991) and Coate (1995). For a discussion of the Samaritan's dilemma in connection with foreign economic aid, see e.g. Svensson (2000), Pedersen (1996,2000) and Azam and Laffont (2000).³

A novel aspect of this paper is to include more than one provider of foreign economic aid, and to evaluate costs and benefits of an integrated solution - donor cooperation- in light of the incentive problems associated with foreign economic aid. This focus resembles the discussion of the profitability of horizontal mergers in quantity competing oligopolies.⁴ If two, or more, firms merge they typically reduce production below the total output produced by the merging firms if they operate individually. When output falls, prices increase, and as a response the non-

²This crowding out problem is also referred to as the fungibility of aid, see Pedersen 1997 for a general discussion of this phenomenon, and Hagen 1999 for an interesting discussion of aid fungibility and the political economy of foreign economic aid.

³Pedersen (2001) shows that when several recipient government compete for aid, poverty averse donors might in fact be counter-productive and increase poverty, simply because each recipient has incentive to pose as poor in order to get more transfers. Svensson (2000) argues that one way to avoid this problem is to delegate part of the aid budget to a multilateral agency that is less poverty averse than the donors.

⁴See also Bucholz et al.(1998) for a similar discussion, they analyse partial integration in a situation where n identical actors contribute to a public good.

merging firms expand their production. Hence, the merging firms face the same countervailing effects of cooperation as the providers of foreign economic aid do. By merging they solve a collective action problem among its constituent firms. The bad news is that merging makes the behavior of the outsiders more adverse, more aggressive. It is well known that whether or not mergers are profitable depends critically on the cost functions of the merging firms.⁵

Traditionally, the profitability of partial horizontal mergers has been studied in games where all parties move simultaneously.⁶ In the foreign economic aid problem I am concerned with, it is more natural to consider a sequential game where donors move after the recipient government. A sequential structure captures the Samaritan's dilemma faced by altruistic donors. It is interesting that the adverse effects of donor cooperation - the reduction in domestic support to the poor - is mitigated when donors act as Stackelberg followers, compared to a simultaneous move game. Cooperation is, in other words, more profitable if donors face a Samaritan's dilemma.

2 A model

To study the countervailing effects of cooperation in the provision of foreign economic aid, it suffices to have two donor countries denoted 1 and 2, and one country that receives foreign aid, R . In each country the government decides, among other things, the provision of aid to the poor in R . Each donor country divides a fixed income, Y_i , between domestic consumption C_i and aid A_i . It would be more realistic to let the amount of foreign economic aid be determined in a political process, and financed by distorting taxes. But adding realism along these dimensions only muddles the focus of our concern. To concentrate on the theme of this paper we simply assume

⁵Salant et.al (1983) show that it is not profitable for two firms to merge if demand and costs are linear. Perry and Porter (1985) show that merger can be profitable if costs are sufficiently convex.

⁶One exception is Huck et al (2001), they discuss mergers in a quantity competing sequential game.

that each donor's budget constraint is given by

$$C_i + A_i = Y_i. \quad (1)$$

In the deprived country there is a group of rich individuals (indexed r) in addition to the poor masses (indexed p). For simplicity I assume that both groups, the rich and the poor, consist of only one person. Let I_i represent the income type i earns without any interventions from the government in R , or from outside world, $i = r, p$, with $I_r > I_p$. The government in R reallocates income between the two groups. Let T be the amount of lump sum taxes the government collects from the rich and transfers to the poor. T can be negative; the R -government might transfer money from the poor to the rich, within limits, of course, hence, T must be larger than $\bar{T} < 0$. The possibility of a negative T captures the idea that the domestic government can choose a policy that suppresses the income potential of the poor, to the advantage of the rich, an alternative that is particularly relevant if the poor receives a lot of support from outside.

The consumption of the rich and the poor in R is given by

$$\begin{aligned} C_r &= I_r - T \\ C_p &= I_p + T + FA, \end{aligned} \quad (2)$$

where FA denotes the total amount of foreign economic aid the poor in R receives ($FA = A_1 + A_2$)

Each donor maximizes a welfare function that increases in the consumption of the poor in country R . More specifically I assume that donor i has a welfare function

$$W_i(C_i, C_p), \quad (3)$$

which is twice differentiable and quasi concave, in addition both domestic consumption and the consumption of the poor are strictly normal goods. Donor i maximizes (3) subject to the budget constraint given by (1). The government in R maximizes

$$V(C_r, C_p), \quad (4)$$

subject to budget constraint (2). This function increases in both arguments, is twice differentiable and quasi concave, and the consumption of the poor and the rich are strictly normal goods.

As we can see, this simple model assumes that donors can target their help to the poor in R . Nevertheless, there is an incentive or crowding-out problem associated with foreign economic aid, since the government in R will reduce their support to the poor (or increase the taxes levied on the poor) as foreign economic aid flows in from abroad. This crowding out problem is more general and could be modelled in many different ways. Alternatively, one could for example assume it impossible for donors to target aid to the poor. Foreign economic aid is then a windfall income for the government in R , and there will be a crowding out problem as long as some of this extra income is given to the rich. These two interpretations are similar as long as there is an interior solution in the first case, that is, as long as the government in R chooses $T > \bar{T}$.

Is this crowding out problem intensified if donors unite their poverty reducing effort? Or more generally: What happens to donors welfare, and the consumption of the poor, if donors integrate their foreign economic aid policy?

The answer depends, as usual, on a number of issues. One critical factor is whether or not donors can enforce contracts that make aid contingent on policy decisions in R . If not, if this is a non-contractible relationship, as I shall argue is the most natural assumption, another critical factor is the sequence of moves: Does the effect of cooperation depend on whether the involved parties move simultaneously or sequentially, and if sequentially, in which order they move?

I begin with a brief discussion of donor cooperation if it is possible for donors to use a contract to make aid conditional on domestic policy in the receiving country. The discussion is brief since I believe that this contracting for aid perspective is unrealistic. I then proceed to discuss cooperation in a model without contracts, first in a simultaneous move game, thereafter in a sequential move game in which donors observe domestic policy in R before they provide help to the poor.

3 Contracts and aid

The model depicts a situation where donors and the recipient have conflicting interests. The donors want to target aid to the poor in R , while the government in R wants to allocate some of the resources received to the rich. We recognize the situation from the principal-agent theory, and from that literature we know that the principal can - partly or fully, it depends among other things on the information structure of the situation - align interests by offering the agent a well designed incentive contract. Can the same idea be applied here? Can donors offer an enforceable conditional aid contract? I think not, and I explain why not later. But, as a background, I shall briefly discuss the effects of cooperation if donors can use contracts to enforce a contingent aid policy.

Contracting for aid in a perfect world

Suppose all relevant information is available to the donors and the recipient when they sign contracts. Furthermore, suppose donors have all the bargaining power. Let $V^a = V(C_r^a, C_p^a)$ denote maximal welfare for the government in R in an autarchy, that is, the welfare it obtains if there is no foreign economic aid, and let W_i^a be maximal autarchy welfare in donor country $i = 1, 2$.

Suppose donors - independently and simultaneously - offer the government in R a take it or leave it contract $\{A_i, T\}$ $i = 1, 2$. The contract makes foreign economic aid *conditional* on T , that is, on how well the government in R treats its own poor citizens. The optimal contract maximizes welfare in each donor country i , given the budget constraint in i , the aid provided by the other donor, and the constraint that the government in R participates, i.e. the constraint that the government in R accepts the conditionalities associated with foreign economic aid.

Formally, the optimal contract for donor i solves

$$\max_{\{A_i, C_p\}} W_i(C_i, C_p).$$

Subject to the budget constraints,

$$C_i + A_i = Y_i,$$

$$FA + T = C_p,$$

and the participation constraint

$$V(C_r, C_p) \geq V^a.$$

A candidate solution to this problem is a Nash equilibrium in the actions taken by the donors and the government in R . Denote a solution to this problem $\{A_1^*, A_2^*, T^*\}$.⁷

The exact amount of foreign economic aid given in the Nash-equilibrium depends on the shape of the donors' and the recipient's welfare functions (on how poverty averse they are). It is, however, easy to understand that a Nash-equilibrium entails $0 < A_1^* + A_2^* < (C_p^* - C_p^a)$, or, in plain English, the consumption of the poor increases by more than the amount of foreign economic aid they receive. The reason is that $W_R(C_r, C_p)$ increases in C_p , which means that the government in R accepts a reduction in the income of the rich in exchange of receiving foreign economic aid targeted to the poor.

We can also conclude, without making any reservations at all, that cooperation among donors is unconditionally beneficial in this contract regime. There is no incentive problem - no crowding-out problem - that can be aggravated by cooperation. On the other hand, cooperation solves the common good problem associated with foreign economic aid. In other words, cooperation has only benefits, no costs, except of course for the rich elite in R .⁸

Realism. According to this model it is easy to reduce poverty in developing countries. Given the right contract, a \$ of foreign economic aid increases the consumption of the poor with more than a \$. Unfortunately, the model does not fit reality very well. Empirical studies find little or no effect of foreign economic aid on poverty alleviation, or on economic development more generally. Data indicate

⁷In the literature on principals and agents this situation - where more than one principal is providing incentives to one agent - is known as a common agency, see Stole (1990) and Martimort (1992).

⁸Cooperation implies higher welfare for each donor, and higher consumption for the poor in R . Cooperation does not affect the welfare for the government in R . The only one who suffers from cooperation are the rich in R , their consumption decreases.

that foreign economic aid is fungible, and hence that economic aid has strong *crowding out* effects on domestic initiative, not *crowding in* effects as the model above indicate.⁹

It is not surprising to find a discrepancy between reality and the predictions of this model. The real world is not perfect; the model rests on several problematic assumptions. It is possible to make things more realistic within the contracting-for-aid regime. For example, one could assume that the government in R has private information about its will - or skill - to increase the poor's consumption. This would make it more costly to use foreign economic aid to reduce poverty; when there is asymmetric information between donors and the recipient, some of the aid intended for the poor, ends up in the pockets of the rich in R . This, and a great deal more, has been shown formally by Karl Rolf Pedersen (1995) and Azam and Laffont (2000).

Furthermore, drawing on results derived in the common agency literature, we can conclude that donor cooperation is strictly beneficial also when there are asymmetric information between donors and the government in R . The reason is the agent's action (the government in R 's transfer to the poor in R) are complements for the principals (the donors), and we know that united principals implies strictly higher welfare for the principals in this case, see Stole (1990) and Martimort (1992).

Another way to gain realism within the contract paradigm would be to relax the assumption that the donors have the whole bargaining power. Splitting the bargaining power between donors and the recipient government would make foreign economic aid less effective, again the foreign economic aid crowds out domestic support to the poor.

In my view, however, this is not the right way to proceed. Both the providers of foreign economic aid, and the government in the country that receives aid, are sovereign nation states, and it seems far-fetched to imagine that they can sign a contract, which, if broken, is enforced by a third party. Maybe the contract in question is not an explicit contract backed by a third party (the court), but an implicit contract backed by the parties' concern for their long term reputation. Maybe donors and the recipient fulfill their part of the agreement because they

⁹See for example Boone (1996) and Burnside and Dollar (2000).

realize that opportunistic behavior today implies a return to autarchy in the future. This is a more promising idea, but also this interpretation is problematic. The question is how altruistic donors can make it credible that they will not renege on their threat of "not helping the poor in R in the future, unless.." The dilemma is well known. James Buchanan (1975) termed the problem faced by altruistic donors that cannot commit their actions ex-ante, the Samaritan's dilemma.¹⁰

In my view, the tools of applied contract theory, the principal-agent model, does not capture the nature of the relationship between donors and recipients of foreign economic aid. It is more realistic to model the interaction between the parties as a non-contractible relationship.

4 Aid without contracts, and the issue of cooperation among donors

Without contracts, we immediately see that there is indeed an incentive - a crowding-out - problem associated with foreign economic aid in the model outlined in section 2. The simple fact that the government in R considers both consumption of the rich and the poor as normal goods implies that more foreign economic aid to the poor in R means less support from their own government. Cooperation might then become a double edged sword. If donors unite their poverty reducing effort they solve the underprovision-of-a-public-good-problem associated with foreign economic aid, but cooperation might also aggravate the crowding-out problem associated with foreign economic aid.

The magnitude of these two opposing effects - and therefore the overall outcome of cooperation - might depend on the interaction pattern in this aid game. The structure that best captures the Samaritan's dilemma mentioned earlier, is a sequential game where donors act as Stackelberg follower. By modelling donors as followers we make it explicit that it is difficult for altruistic donors to credible

¹⁰Later Neil Bruce and Michael Waldman (1991) and Stephen Coate (1995) have argued that the Samaritan's dilemma has important implications for the design of poverty alleviation programs.

commitment not to help the poor in R - even if the government in R misbehaves. A sophisticated R -government looks ahead and anticipates how their own poverty reducing effort influences the amount of foreign aid the poor receives. Even though a sequential game is the interaction pattern that best grasps the situation, I find it natural to start with a symmetric game in which donors and the recipient make their contributions to the poor simultaneously.

4.1 Simultaneous moves

To simplify, from hereon I assume that both donor countries are identical. To assess the effects of donor cooperation, I first characterize the equilibrium when donors operate separately, thereafter I solve for the equilibrium when donors integrate their foreign economic aid policy. Finally, I compare the two situations.

Non-cooperation Suppose the donors and the government in R make their aid decisions simultaneously and that the total support to the poor in R is given by the profile (A_1, A_2, T) that constitutes a Nash-equilibrium in this game.

The profile $(A_1^{nc}, A_2^{nc}, T^{nc})$ is a Nash-equilibrium if, and only if, A_i^{nc} maximizes $W(Y_i - A_i, I_p + T^{nc} + A_j^{nc} + A_i)$ for $i = 1, 2$, and $j = 1, 2$ and $i \neq j$, and T^{nc} maximizes $V(C_r - T, I_p + T + FA^{nc})$, where $FA^{nc} = A_1^{nc} + A_2^{nc}$.

Given the objectives of the donors and the government in R , the profile $(A_1^{nc}, A_2^{nc}, T^{nc})$ must solve the following first order conditions¹¹

$$-W'_1(Y_i - A_i^{nc}, I_p + T^{nc} + FA^{nc}) + W'_2(Y_i - A_i^{nc*}, I_p + T^{nc} + FA^{nc}) = 0 \quad (5)$$

for $i = 1, 2$, and

$$-V'_1(I_r - T^{nc*}, I_p + T^{nc} + FA^{nc}) + V'_2(Y_i - T^{nc}, I_p + T^{nc} + FA^{nc}) = 0 \quad (6)$$

Cooperation. If donors cooperate and integrate their foreign economic aid policy we assume that they efficiently solve the public good aspect associated with

¹¹ W'_i denotes the first derivative of the function W with respect to argument i .

the "common good" problem. Hence, an integrated policy chooses A_1 and A_2 so as to maximize $W(C_1, C_p) + W(C_2, C_p)$ subject to the constraint that $C_1 = Y_1 - A_1$ and $C_2 = Y_2 - A_2$. The countries are identical, and marginal utility of domestic consumption is decreasing, it is therefore optimal to let each donor finance half of the total amount of foreign economic aid; $A_i = \frac{1}{2}FA$. Hence, we can write the problem as

$$\max_{FA} 2W\left(Y - \frac{1}{2}FA, I_p + T + FA\right).$$

Let $FA^c > 0$ and $T^c > \bar{T}$ denote the Nash-equilibrium if donors cooperate. The first order condition for foreign economic aid is now given by,

$$-W'_1\left(Y - \frac{1}{2}FA^c, I_p + T + FA\right) + 2W'_2\left(Y - \frac{1}{2}FA^c, I_p + T + FA\right) = 0 \quad (7)$$

Comparison. Comparing the first order conditions in the non-cooperative and cooperative case (comparing equation (5) and (7)) confirm that integration implies more foreign economic aid for any policy chosen in R ; $FA^c > FA^{nc}$ for all T . As a consequence - since both consumption of the poor and the rich are normal goods - the government in R reduces domestic support (increase domestic taxation) of the poor. We might conclude:

Proposition 1 (i) *In a simultaneous move game, cooperation among donors implies less internal support to (increased taxation of) the poor: $FA^c > FA^{nc} \Rightarrow T^c < T^{nc}$.*
(ii) *The consumption of the poor increases: $FA^c - FA^{nc} > T^{nc} - T^c$.*

The last conclusion follows directly from the fact that both the consumption of the poor and the rich are normal goods for the government in R .

Does donors' welfare increase if they integrate their foreign economic aid policy? Proposition 1 does not provide an answer, to get one we need to specify more about the underlying welfare functions. An example is provided in section 5.

4.2 Donors as Stackelberg followers

Intuitively, one might think that the negative incentive effect of cooperation among donors, the aggravation of the crowding out effect, is most pronounced when donors act as Stackelberg followers. This seems natural; cooperation makes the foreign economic aid policy more accountable, and therefore, possibly, more exposed of being exploited by the government in R . The argument is perhaps intuitive, but it turns out that it is the other way around.

To show this consider a sequential game in which the donors observe the allocation made by the government in R before making their contribution to the poor in R . If donors cooperate they make a joint decision, if they don't they independently choose their contribution to the poor in R , each taking the other donor's contribution as given.

Suppose the total amount of economic aid the poor receives is given by the profile $(\tilde{A}_1^j, \tilde{A}_2^j, \tilde{T}^j)$ for $j = nc, c$, that constitutes a sub game perfect equilibrium in this sequential game ($\tilde{}$ is used to distinguish the equilibrium values in the sequential game from the equilibrium values that entails in a simultaneous move game).

To evaluate the effect of cooperation we start at the second stage. Suppose we, and the government in R , have solved the "contribution" problem at the second stage, that is, we have found an expression of how foreign aid depends on the level of domestic aid, $\widetilde{FA}^j(T)$.

$\widetilde{FA}^{nc}(T)$ is found by adding together the individual contributions that constitute a Nash-equilibrium in the second stage game between the donors. $\widetilde{FA}^c(T)$ is the amount of foreign economic aid given if donors cooperate. It is given by the level of foreign economic aid that maximizes the sum of the donor countries' welfare.

Turning to the first stage, and assuming an interior solution, we get the following first order condition for optimal domestic policy for the government in R :

$$\frac{dV}{dT} = 0 \Rightarrow V_1'(I_r + T, FA^j(T) + T) + V_2'(I_r + T, FA^j(T) + T) (1 + F^{j'}(T)) = 0 \quad (8)$$

Suppose initially that donors operate individually. Equation (8) informs that if donors decide to unite their poverty reducing effort, this might change the first

order condition for optimal domestic policy via *two* different channels; there is a level effect and a response effect.

The level effect: We know from the proceeding section that cooperation increases the *level* of foreign economic aid, i.e. $\widetilde{FA}^c > \widetilde{FA}^{nc}$. It is straightforward to confirm, looking at equation (8), that an increase in foreign economic aid implies less internal support to the poor $\widetilde{T}^{nc} > \widetilde{T}^c$.

The response effect: In addition to the level effect there is a potential response effect of cooperation: Cooperation might change the response in foreign economic aid as the government in R changes its poverty alleviation effort. It is easy but tedious - hence the calculations are made in an appendix - to confirm that the donors response to changes in domestic policy is "flatter" when they cooperate. Formally we have $-1 < \widetilde{FA}^{nc'}(T) < \widetilde{FA}^c'(T) < 0$. Hence, if we isolate the response effect we get $\widetilde{T}^{nc} < \widetilde{T}^c$.

To understand why cooperation mitigates how foreign economic aid responds to changes in domestic policy, consider the following thought experiment. Assume that the receiving country reduces T with one unit. If donors do not cooperate, each donor calculates an appropriate increase in its provision, taking the contribution from the other donor *as given*: each donor does not reckon with the response taken by the other donor. This externality implies that a unit reduction in domestic help generates a higher inflow of foreign resources if donors do not cooperate.

Adding the level effect and the response effect together implies that we no longer can - as we could in the simultaneous move game - conclude that cooperation among donors implies less domestic support to the poor. What we can conclude, is that cooperation becomes more beneficial if donors face a Samaritan's dilemma. It is perhaps worthwhile to state this formally

Proposition 2 (i) *Cooperation among donors that are Stackelberg followers has countervailing effects on domestic poverty transfers. (ii) The adverse domestic effect of donor cooperation - the aggravation of the crowding out problem - is less pronounced when donors face a Samaritan's dilemma.*

Regarding the second statement, it is important to note that the Samaritan's

dilemma is a dilemma that creates a problem for donors; the donors' welfare is lower when their altruism can be strategically exploited by the recipient government. The second statement in Proposition 2 tells us that the negative effect of cooperation is less pronounced if donors are in a Samaritan's dilemma situation.

We can also conclude, as we could in the preceding section, that cooperation implies more resources both to the poor and the rich in recipient country. Again it is impossible to say how cooperation affects welfare of the donors. All we can say with these general functional forms, is that foreign aid increases, and that the effect on domestic aid is uncertain. To derive more exact conclusions we need more structure on the shape of the welfare functions.

5 Logarithmic welfare

Suppose donor i maximizes the objective function

$$W_i(C_i, C_p) = \rho \ln(C_i) + (1 - \rho) \ln(C_p), \quad (9)$$

subject to the budget constraint $C_i + A_i = Y$, $i = 1, 2$. The government in the receiving country maximizes

$$V(C_r, C_p) = \gamma \ln(C_r) + (1 - \gamma) \ln(C_p) \quad (10)$$

subject to the constraint $C_r = I_r - T$ and $C_p = I_p + T + FA$.

Non-cooperation

The Nash-equilibrium $(A_1^{nc}, A_2^{nc}, T^{nc})$ must solve the first order conditions,

$$\frac{-\rho}{(Y - A_i)} + \frac{(1 - \rho)}{(I_p + T + FA)} = 0 \text{ for donor } i, \text{ and} \quad (11)$$

$$\frac{-\gamma}{(Y - A_i)} + \frac{(1 - \gamma)}{(I_p + T + FA)} = 0 \text{ for the government in } R. \quad (12)$$

Cooperation

The Nash-equilibrium (A_1^c, A_2^c, T^c) must solve the first order conditions,

$$\begin{aligned} \frac{-\rho}{(Y - A_i)} + 2\frac{(1 - \rho)}{(I_p + T + FA)} &= 0 \text{ for donor } i, \text{ and} \\ \frac{-\gamma}{(Y - A_i)} + \frac{(1 - \gamma)}{(I_p + T + FA)} &= 0 \text{ for the government in } R. \end{aligned} \quad (13)$$

Comparison

We immediately see from the first order conditions that $FA^c > FA^{nc}$, and $T^c < T^{nc}$. Solving these first order conditions give parametric expression of the amount of foreign economic aid and domestic economic aid the poor receives, both when donors cooperate and when they operate independently. I have evaluated the solutions for different parameter values. It always turns out that cooperation lowers the welfare for the donors. I have not been able to show this analytically, but numerically it always turn out to be the case. Let me just report a typical example: Let $Y = 100$, $I_r = 20$, $I_p = 5$, $\rho = 0,97$ and $\gamma = 0,9$; the donors are primarily concerned with their own consumption, and the government in R are primarily concerned with the consumption of the rich elite in R . In this case the numbers are (recall that superscript nc is for non-cooperation, and c for cooperation among donors)

$$\begin{aligned} A_i^{nc} = 2,6 \quad T^{nc} = -7,1 \quad c_p^{nc} = 3 \quad c_r^{nc} = 27,1 \quad W_i^{nc} = 4,47 \\ A_i^c = 14 \quad T^c = -27,8 \quad c_p^c = 5,3 \quad c_r^c = 47,8 \quad W_i^c = 4,38 \end{aligned}$$

As we can see, the consumption of the poor increases when donors cooperate, but not much compared with how much more foreign economic aid donors provide if they cooperate. In fact most of the increase in foreign economic aid ends in the pocket of the rich in this case, that explains why cooperation lowers welfare for the donor countries.

5.1 The Stackelberg case

Assume welfare functions of the same functional forms as in preceding section. Our aim is again to compare the sub-game perfect equilibrium when donors do not cooperate, with the subgame perfect equilibrium if they do.

Non-cooperation

To find the aid profile $(\widetilde{A}_1^{nc}, \widetilde{A}_2^{nc}, \widetilde{T}^{nc})$ that constitutes the sub-game perfect equilibrium in this sequential game, we start at the second stage to express foreign aid as a function of the policy chosen by the government in R . Foreign aid is given by the unique Nash-equilibrium in the second stage game between the two donors. If we solve the relevant equations we get

$$\widetilde{FA}^{nc} = \frac{2}{1+\rho} [(1-\rho)Y - \rho(I_p + T)].$$

To find the response in foreign economic aid to changes in T , we take the derivative of the foreign aid function and get

$$\frac{\partial \widetilde{FA}^{nc}}{\partial T} = \frac{-2\rho}{1+\rho}.$$

Cooperation

If donors cooperate, the level of foreign economic aid is given by

$$\widetilde{FA}^c = 2(1-\rho)Y - \rho(I_p + T),$$

and the response is given by

$$\frac{\partial \widetilde{FA}^c}{\partial T} = -\rho.$$

Comparison

The equations demonstrate, not surprisingly, that the level of foreign economic aid is higher when donors cooperate, and that the response is "flatter": $\widetilde{FA}^c > \widetilde{FA}^{nc}$, while $-1 < \frac{\partial \widetilde{FA}^{nc}}{\partial T} < \frac{\partial \widetilde{FA}^c}{\partial T} < 0$.

We know that these two effects draw in opposite directions when we now turn to the first stage to solve the policy problem faced by the government in R : a higher level of foreign economic aid implies a reduction in T , while a "flatter" response implies a higher T . It turns out that in this logarithmic case, these two effects do not only draw in opposite directions, they exactly cancel out.

The first order condition for optimal policy in R is

$$\frac{\partial V}{\partial T} = \frac{-\gamma}{I_r - T} + \frac{(1 - \gamma)}{(I_p + T + \widetilde{FA}^j(T))} \left[1 + \frac{d\widetilde{FA}^j(T)}{dT} \right] = 0. \quad (14)$$

If we plug in the above expressions for $\widetilde{FA}^j(T)$, and $\frac{d\widetilde{FA}^j(T)}{dT}$, for $j = c, nc$, into equation (14) we get $\widetilde{T}^{nc} = \widetilde{T}^c = (1 - \gamma) I_r - 2\gamma Y - \gamma I_p$: optimal policy in R is independent of whether or not the donors cooperate

The situation is illustrated in the Figure 1.

Based on this discussion we conclude

Proposition 3 *With logarithmic welfare and with donors as Stackelberg followers, it turns out that cooperation among donors does not aggravate the crowding out problem associated with foreign economic aid. Hence, cooperation Pareto dominates non-cooperation in this case*

6 Concluding remark

When several altruistic donors provide aid to alleviate poverty in another country, they face a common good problem. This calls for a united foreign economic aid initiative. But on the other hand, donor cooperation might change domestic policy in the receiving country in an adverse way. The fear is that the more united and responsible donors act towards the poor in the receiving country, the less responsible does the receiving government act.

In this paper I have shown, in a simple formal model, that cooperation is indisputably beneficial if foreign economic aid can be backed by a contingent enforceable contract. This is certainly true if all relevant information is available to both parties,

but even if the receiving country has private information about its will, or skill, to provide help to the poor in its country, is cooperation beneficial.

It is, however, unlikely that donors can use contracts to align interests, and without contracts I show that donor cooperation can indeed be a double edged sword. In a game where all parties - the donors and the receiving country - make decisions simultaneously, cooperation among the donors will certainly reduce domestic support to the poor. I show that although cooperation always increases the consumption of the poor, the overall effect of cooperation can be negative for the donors.

The most surprising result in this paper is that the negative effect of donor cooperation is less pronounced if donors face a Samaritan dilemma. In a sequential game, where donors must take the domestic policy as given before they provide foreign economic aid, I find that cooperation has a dubious effect on domestic policy in the receiving country. In fact, I find that with logarithmic welfare functions the level of domestic support to the poor is independent on whether or not the donor countries cooperate. In this case we can conclude that donors ought to integrate their foreign economic aid policy.

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Appendix

The slope of the response.

To find $\frac{d\widetilde{FA}^{nc}}{dT}$ we must take hold of the first order conditions that implicitly defines \widetilde{A}_1^{nc} and \widetilde{A}_2^{nc} . By differentiating the two first order conditions given by equation (5) in the text, we find $\frac{d\widetilde{A}_1^{nc}}{dT}$ and $\frac{d\widetilde{A}_2^{nc}}{dT}$, adding them together gives:

$$\frac{d\widetilde{FA}^{nc}}{dT} = 2 \left(\frac{W''_{12} - W''_{22}}{W''_{11} - 2W''_{12} - W''_{21} + 2W''_{22}} \right) \quad (15)$$

Similarly, we find the response in foreign economic aid to a small increase in T in the case where donors cooperate by differentiating equation 7. We get

$$\frac{d\widetilde{FA}^c}{dT} = \frac{W''_{12} - 2W''_{22}}{W''_{11} - 2W''_{12} - W''_{21} + 2W''_{22}} \quad (16)$$

Straightforward calculation show that $-1 < \frac{d\widetilde{FA}^{nc}}{dT} < \frac{d\widetilde{FA}^c}{dT} < 0$.

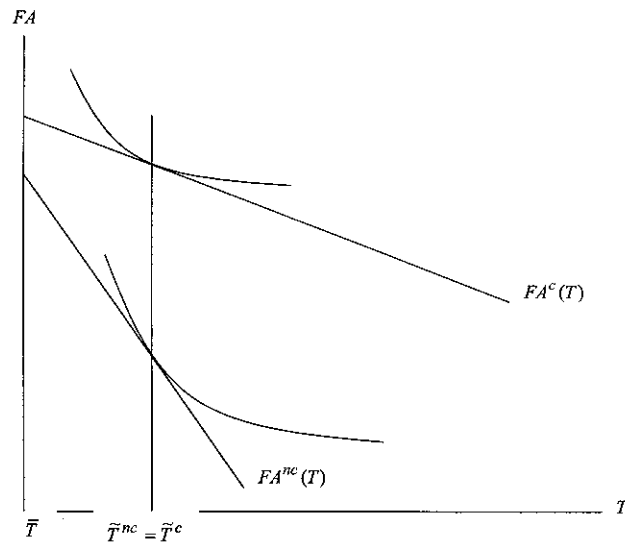


Figure 1. Cooperation implies a higher level of foreign economic aid, but also to a flatter response. In the case with logarithmic welfare the level and the response effect has exactly offsetting effects on domestic policy.