Complements or Substitutes? Bilateral and Multilateral Actions for Development *

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Abstract

While international development is often assumed to have properties of a public good, development as an issue area is actually a collection of heterogeneous goods, only some of which are under provided. The paper draws on models of public goods, in particular in the presence of private co-benefits, to better understand implications for the effective design of development institutions. It concludes that an effective approach to financing international development will proceed along two tracks: unilateral (non-cooperative) action where private co-benefits are high, coupled with complementary multilateralism that creates institutions to fill the gaps that are underfunded by individual country actions. This is counter to conventional wisdom that multilateral institutions with a broad mandate will be more eftua prmoeting
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Industrialized states use a variety of bilateral and multilateral channels to pursue development abroad. They have an interest in doing so in part because the negative aspects of underdevelopment are seldom confined within national borders. Disease, crime, violence, pollution, and instability, among others, have a tendency to create externalities for other states. If enhancing development reduces these, it has benefits beyond the developing country.

The benefits of development for states other than the developing country have properties of a public good, a characteristic of development long recognized in economics and political science.[1] If increased development limits negative spillovers, then any state that had been affected by the spillovers will benefit, whether or not it funds the development. If Ebola virus or avian flu fail to spread because of early detection from an improved health system, multiple countries benefit. If development fosters content and stability within a country, decreasing internal instability and flows of people across borders, all nations in a region - and perhaps beyond - will benefit. When improved political and legal institutions are better able to detect and prosecute terrorists, international drug traffickers, and criminal organizations, many states are better off. Additionally, any one state enjoying the benefit of decreased spillovers from increased development does not detract from the ability of others to also benefit from these decreased negative effects. The benefits of development for other states are, to at least some extent, both non-rival and non-excludable.

"Development" is not, however, a homogeneous public good in the way that reducing greenhouse gas (GHG) emissions or ending overfishing are generally conceived of as public goods (or commons goods). The benefit of a unit reduction in greenhouse gases does not depend on where it occurs; each unit is identical from the point of view of limiting climate change. If ten countries are overfishing in a given area, it is the amount of fishing reduction rather than the identity of the countries that reduce that determines the benefits to states. Of course each state may value GHG reductions or fish differently from other states, but the value of a unit of emissions reduction or a decrease in overfishing to a given state does not vary based on which of

[1]For example, Olson and Zeckhauser (1966).

many other states supply this benefit.

Development, on the other hand, is better classified as a realm of heterogeneous goods that are imperfect substitutes in providing benefits to other states. From the point of view of any individual outside actor, there is no reason to assume that development in Honduras carries the same benefit as development in Eritrea or Indonesia. These are, essentially, distinct goods with different demand functions that vary for outside countries. The United States or Mexico might place a high value on development in Honduras, while Europe prefers development in Eritrea, and Japan or Australia put greater weight on development in Indonesia. Not only might Canada and France place different weight on "development" (as they might place different weight on reducing GHG emissions), but each also likely places different weight on development in Bolivia than it does development in Mali (whereas each would be indifferent between equivalent reductions in GHG emissions in these countries). While the "publicness" of development makes it likely that the literature on public goods provides insights, the heterogeneity of the group of goods comprising international development suggests nuance is necessary when applying these lessons. This is particularly true given variability in the level of private co-benefits for funders across the development realm.

Public goods in international relations often suffer from the desire of states to free-ride and resulting underprovision (or non-provision) of the good. With no supra-national compulsory tax and enforcement mechanisms, these problems are more difficult to overcome at the international than at the domestic level. Yet they are lessened in the presence of heterogeneous preferences or private co-benefits, when individual states will have an incentive to provide some amount of the good, although still sometimes falling short of efficient provision.[2] In the case of a homogeneous good that is under provided, an international institution to pool resources and increase provision is likely a first-best solution, and it has long been recognized that the demand for international

[2]Olson and Zeckhauser (1966); Cornes and Sandler (1994).

institutions includes a desire to overcome market failure.[3] Even in these cases, however, the bargaining problems can be formidable as states each seek to gain the greatest benefit for the lowest cost to themselves.[4]

The market failure argument for international institutions in development is complicated by the fact that development is actually a mix of heterogeneous goods, only some of which are under provided by uncoordinated action. In other cases, high private co-benefits for funding states ensure efficient provision of the public good portion of development, eliminating the need for an institution. This paper argues that a hybrid regime of unilateral action combined with complementary multilateralism aimed at "filling the gaps" between unilateral provision and efficient outcomes will be more efficient than striving for an institution with a broad scope and a mandate to oversee development more generally. In particular, areas where development resources are under provided should not be included in the same institution with areas of development characterized by high private co-benefits for funding states.

When a funding state receives high private co-benefits from its activities in a particular developing country, and when these co-benefits are not also present for other funders, the state will be unwilling to turn over control of development to an institution without ensuring that it receives enough decision-making authority to direct funding in a way that it continues to produce these private benefits. In deciding whether to join a broad development institution, two outcomes are possible for this state: it will either opt-out/circumvent the institution to maintain the status quo, or it will receive disproportionate decision-making power in the institution to accommodate its preferences for the private good.

Granting disproportionate power to an individual state has ramifications on all decision-making for the institution, even on issues where the state does not have high private co-benefits. That is because once granted, the state cannot credibly commit not to use this power

[3]Keohane (1984).

[4]Krasner (1991).

in its own best interest.[5] A subset of the development realm is characterized by the familiar problems associated with providing public goods: all will be better off if the good is provided than they are under the status quo, but states cannot commit not to free ride on the provision of others, so none contribute and the good is not provided. Moving from the socially inefficient non-cooperative outcome to the efficient cooperative outcome requires a commitment mechanism. An institution can serve this function if states commit to foregoing their non-cooperative best outcome so that they can all achieve a superior, cooperative outcome. When some states have disproportionate decision-making power such that they cannot credibly commit to continued cooperation, and other states recognize this, a benefit of the institution is lost and its ability to increase provision of public goods is harmed.

Consider instead that industrialized states, unwilling to give up power over their current resource expenditures and/or unwilling to wrestle with the difficult bargaining problems involved with a broad-scope institution for development, create a complementary institution with a narrower mandate to fill the gap between private provision and the socially optimal provision. This institution has a mandate only to work where resources are under provided from the perspective of maximizing the social benefit that the public good of development provides to industrialized states. States should be willing to allocate resources even while tying their hands by relinquishing power to the institution - indeed, that is the entire point. The decision structure for these new units of development finance is separated from the decision structure for the resources that are guided by sizable private co-benefits. This is essential. If the decision structures are united, powerful states will be unwilling to relinquish control over their spending decisions to the institution and the group will be dominated by the interests of the most powerful, rather than moving away from underprovision and toward the social optimum. Instead, states should be free to pursue their non-cooperative interest where high private co-benefits significantly decrease or eliminate underprovision, while relinquishing significant control in areas where the only way to achieve collective benefits is to overcome individual incentives to defect. Perfectly grouping

[5]See Stone (2013).

development into two groups, one in which institutions are helpful and one in which they are unnecessary, is an ideal type that cannot be achieved in the real world. Nevertheless, understanding the potential benefits of such a separation can provide guidelines for institutional design.

The analysis draws on models of public goods provision, with and without private co-benefits, and provides insights for the design of international institutions and for balancing non-cooperative and cooperative action. This represents an advance over previous models of development and the provision of foreign aid, which assume homogeneous preferences on the part of donors (e.g. Torsvik (2005)) and/or homogeneity of development as a good (e.g. Bourguignon and Platteau (2015)), or focus primarily on bilateral actions, without drawing lessons for the multilateral aspects of development promotion (e.g. Steinwand (2015)). Each of these works advances the thinking on development as a public good; it is the task of the current work to draw insights from these while incorporating new elements into the analysis.

Powerful development institutions, such as the World Bank, are at a crossroads, rethinking their role in a changing world. New organizations, such as those created to help transfer resources from richer to poorer countries for projects related to climate change, need guidance to become relevant. Too often development institutions act as substitutes for unilateral action by industrialized states, operating in similar issue areas and locations as bilateral programs. Revamping these organizations to act as complements to, rather than as substitutes for, the uncoordinated actions of industrialized states can have benefits. In issue areas comprising multiple goods with varying degrees of private co-benefits, confining an institution to the portion of the issue area characterized by underprovision results in fewer bargaining problems and a more optimal solution than attempting to create a broad, over-arching institution. In these situations, decoupling - rather than linking - the private-good and public-good components is preferable. This suggests limits on the benefits of issue linkage in areas that are characterized by public goods in the presence of significant, and heterogeneous, private co-benefits.

1 Breaking it Down: Development as Heterogeneous Goods

In an important study of foreign aid allocation, Collier and Dollar (2002) argue that "the poverty impact of aid could be roughly doubled" if its allocation were made more "efficient".[6] While recognizing that aid can serve many purposes beyond development, the authors argue that comparing a "poverty-efficient" allocation of aid to its actual allocation "provides information on the opportunity cost (in terms of poverty reduction) of pursuing other objectives with aid resources."[7] Presumably, these other objectives can include "non-efficient" poverty reduction - pursuing poverty reduction where it benefits the donor at the expense of greater reductions elsewhere - as well as geostrategic purposes, although the authors do not point in this direction.

There are two problems with this manner of reasoning. First, and well-understood, is that there is a relationship between level of private co-benefits from producing the public good of "development" and the amount of resources provided.[8] If private co-benefits of giving development resources are reduced by allocating aid more "efficiently" for development, there will be more free-riding and fewer resources provided. Creating a system that moves away from reliance on private co-benefits for financing misses the opportunity to leverage these private co-benefits for increased resources. Olson and Zeckhauser make this point regarding private co-benefits and divergent preferences in alliances: when these increase "the degree of coordination among the allies will decline, and this will reduce the efficiency of the alliance forces (in a sense leaving them on a poorer production function), but the alliance forces will be larger."[9] The net impact on alliance strength of the increased but less efficient resources is unclear.

[6]Collier and Dollar (2002, p. 1475).

[7]Collier and Dollar (2002, p. 1476).

[8]On private co-benefits and public goods see, for example, Andreoni (1990); Cornes and Sandler (1994); Pittel and Rubbelke (2008).

[9]Olson and Zeckhauser (1966, p.272).

The analogous argument can be made for private co-benefits and development.

The less commonly understood problem with this type of argument lies in the fact that, if "development" is a different good across countries (i.e. an industrialized state has a different demand curve for development in each developing country), then there is no reason to assume that the opportunity cost of pursuing development (or other objectives with development resources) in Country *X* is best measured by foregone development in other countries. Industrialized states can reallocate funds from multiple sources, including from private consumption by increasing taxes, to fund programs in Country *X*. To do this efficiently, they will reallocate resources from the activity with the lowest marginal benefit, which may or may not be in the realm of development.

Suppose there are developing countries in which, from the point of view of contributing states, development is underfunded. They suffer from a classic multi-party prisoner's dilemma problem: all potential funding countries would be better off if the development resources were provided, and the sum of benefits is higher than the cost, but each funder has a dominant strategy to defect and hope that others provide the benefit. This is likely to occur in situations where there are few private co-benefits in excess of the common public benefit. Now suppose that, realizing this, the funders come together to collectively provide development to this country. It does not follow that they will do so at the expense of other development programs that provide them private benefits.

Efficient provision of a public good does not result from telling contributors which private benefits they must forego in order to finance the public good. For instance, when a government collects taxes it does not do so by telling its citizens that all the money they have previously spent on movies must now be contributed to the government. Rather, it sets a contribution amount that has an income effect on individuals, who can then choose to allocate their remaining income across private goods as they see fit. Telling the United States, France, Japan, or Switzerland that it must finance the public good of development in one country by giving up the private benefits it receives from using development resources in another country is analogous to telling the average taxpayer that she must finance national defense by giving up movies. This is certainly not

efficient, except in the highly unlikely case that every taxpayer would have chosen to forego movies as the least-hurtful way of paying the increased tax bill.

Suppose that, from the point of view of industrialized states, development assistance is underprovided to Burundi, in that the sum of the marginal benefits to each industrialized country is greater than the cost of provision. Further suppose that the public development benefits of an additional dollar spent in Egypt are far less than a dollar, meaning from a development efficiency standpoint "too much" aid is going to Egypt. However, that aid buys both the public good of development and the private good of nice behavior toward the donor (e.g. the US). That private good has a benefit that is factored into the donor's decision. In fact, it is the countries that are receiving "too much" aid from a development standpoint that are likely closest to their efficient points (considering private benefits as part of total social benefits, as we should)- the private benefits for individual donors may be high enough that they also cover the efficient amount of the public good. This does not negate the fact that too little (from a MSB point of view) is spent in Burundi. It does, however, suggest that telling donors they should spend less in Egypt in order to spend more in Burundi is the wrong way to maximize social welfare. Instead de-coupling Egypt and Burundi, and allowing private provision to efficiently provide for assistance to Egypt while separately setting up a collective fund for Burundi, has a greater chance of arriving at a more efficient outcome and at lower bargaining cost.

2 Heterogeneous Public Goods and Private Co-Benefits

It is useful to examine different possible structures of the external "market" for development and the potential for the market to under provide the good. The analysis is looking at this from an outside actor perspective. It is assumed that any country receives a private benefit from its own development. The issue examined here is external benefits to other states that stem from development in a country, many of which are public in nature. For simplicity I assume there are two types of countries, industrialized and developing, with the former considering investments to promote development in the latter. For purposes of the analysis, the industrialized states are

assumed to act to maximize their own utility, thus they pursue development (unilaterally or collectively) when it is in their own interest. That means that "social benefit" and "social welfare" are defined solely in relation to the contributors, they do not actually constitute *global* social welfare, which would include the private benefits to the developing states. This is not meant to imply, from a normative standpoint, that we should not consider the private benefits to those in developing states; it simply recognizes that industrialized states maximizing their own utility would not consider them.

Certain types of development exhibit characteristics of market failure that could potentially be attenuated by coordinated action through an international institution. Even in these situations, the bargaining problem can be complicated by significant heterogeneous preferences that are compounded when development is considered as a class of goods rather than as a homogenous concept. There exist other situations, however, in which no underprovision occurs. This section begins with a basic scenario, then adds heterogeneous preferences over a homogeneous good, heterogeneous preferences over heterogeneous goods, and finally private co-benefits. A distinction between heterogeneous preferences for the public good and private co-benefits is important, although both potentially lead to some countries demanding and supplying more of the public good than other countries. When heterogeneous preferences over a public good exist, some actors receive more benefit from the good than others. This does not change the "public" nature of the good. For instance, captains that frequently sail to a certain stretch of rocky coast gain more from a lighthouse than those who sail there once every five years. We might reasonably expect that the frequent users will have more incentive to provide the good and the infrequent users free-ride off its provision. Yet the lighthouse is still a public good; there are no private (i.e. excludable) benefits associated with it.

Private co-benefits arise when an individual actor receives additional benefit from the portion of the public good that she contributes. The actor does not receive this benefit from portions contributed by others, and others cannot free-ride off her contribution to receive it themselves: it is a private benefit that is produced in tandem with the public benefit. The existence of these

private co-benefits can, under certain circumstances, eliminate underprovision of the public good.

2.1 Scenario 1: The Classic Prisoner's Dilemma

A helpful starting point is to consider a scenario where the market for a development good looks similar to the market for reducing GHG emissions; I will refer to this as Scenario 1. This is often depicted graphically as a multi-party Prisoner's Dilemma, in which every party would be better off under the cooperative outcome but it is individually rational for each to defect. For climate change, no individual country can reverse climate change alone by reducing its own emissions, and each would prefer that emissions are reduced while others shoulder the majority of the costs associated with the reduction. In the realm of development, this might depict a situation of famine in a relatively remote area: no industrialized state is happy to see children dying on the television screen, each prefers a situation in which all contribute a little and starvation is halted to the status quo of the continuing famine, but no actor has a particular incentive to invest large amounts of money and small contributions will not do much without others also contributing. This classic example is portrayed in Figure 1. In such cases, a multilateral institution to coordinate the response could improve on the status quo for development, just as it can in the case of climate change. This situation is most likely when costs and preferences are similar across potential contributors. There will still be a bargaining problem in forming an institution. While all states are better off if the good is provided, each has an incentive to try to minimize the cost he bears for its provision. The complexities of negotiations to develop a plan to stabilize atmospheric GHG concentrations are a case in point.

2.2 Scenario 2: Non-Cooperative Provision of a Public Good

Scenarios can arise where the non-cooperative Nash equilibrium involves voluntary provision of a public good. Olson (1965) referred to situations where a "privileged group" exists. Sandler (2015, p. 199) summarizes this as a situation in which there exists "at least one individual or coalition whose perceived benefits from collective action exceed the associated costs, even if these costs

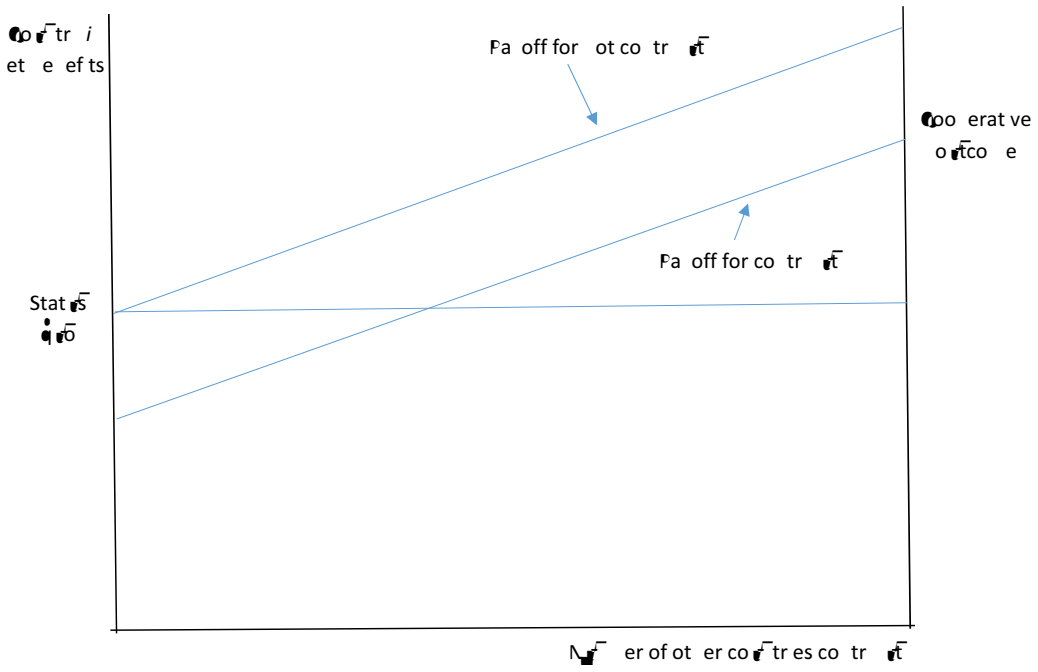

Figure 1: Multi-Party Prisoner's Dilemma

are borne solely by the individual or coalition." In this case, the individual actor or group provides some amount of the public good in the non-cooperative setting and non-contributors free-ride off the provision, a version of the "exploitation hypothesis" in which those that receive lower benefits from the good enjoy its provision without any contribution, thereby "exploiting" those who receive higher benefits and supply the good.[10]

Figure 2 is adapted from Sandler (2015), and shows the reaction functions and Nash equilibrium for a situation in which there are two countries, Country A and Country B, that each have an incentive to unilaterally contribute to the public good, development (D), which is here still modeled as a single, homogeneous good. The amount of development supplied by Country A is denoted d_A and the amount provided by Country B is d_B, with $D = d_A + d_B$. Because the good is public, each country benefits from its own contribution and that of the other country, which it takes into account when setting its contribution level. The reaction function for Country A (R_A) shows the best response of Country A to each level of provision by Country B: as Country B increases its provision, Country A benefits from this and therefore decreases its own provision. The reaction function for Country B is analogous. The Nash equilibrium of this non-cooperative game occurs when the reaction functions intersect: here each country's chosen amount is a best response to the chosen amount of the other, and neither has an incentive to unilaterally change behavior (NE in Figure 2).

In Figure 2, each country maximizes its own utility with regard to provision of the public good, taking into account the amount supplied by the other but not the utility of any country but itself. Thus, each country $i = A, B$ chooses d_i such that its marginal (private) benefit (MPB) from the last unit equals the marginal cost (MC) of the unit. At the Nash equilibrium, assuming positive contribution from both Country A and Country B, it must be the case that $MPB_A = MC = MPB_B$. Since $MPB_A = MPB_B > 0$ at equilibrium, it follows that

[10]Olson (1965); Olson and Zeckhauser (1966); Buchholz and Sandler (2016).

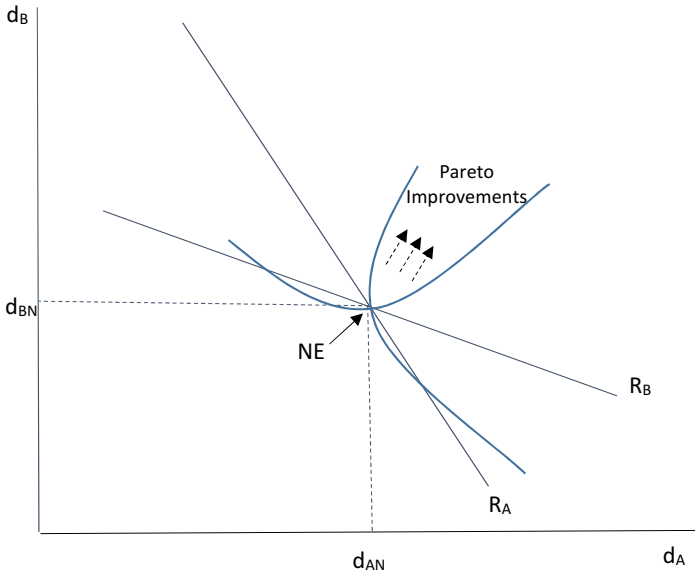

Figure 2: Sub-Optimal Private Provision of a Public Good. Adapted from Sandler (2015), Figure 6, p. 208.

$MSB = MPB_A + MPB_B > MC$, where marginal social benefit (MSB) is the summation of private marginal benefits, and will be higher if there are benefits to third-party non-contributors not pictured in Figure 2. Thus the Nash equilibrium is not a social optimum. Figure 2 includes the iso-utility contours for Country A and Country B at the Nash equilibrium[11], with the set of Pareto improving points represented by the lens between the curves.

As the non-cooperative Nash equilibrium is not a social optimum, there is room for an institution to provide benefits through cooperation. There are some circumstances when the non-cooperative outcome need not be sub-optimal. First, if only one country contributes voluntarily then other countries are at corner solutions, where they might wish to reallocate funding away from this good but, as non-contributors, they are unable to do so and must accept the private provision level. In this case, once the providing country reaches the point where $MPB = MC$, social efficiency might not dictate additional funding. Second, if the good provided is a threshold good or a "best shot" good,[12] there might be no additional benefit to extra provision once the threshold is reached - if this occurs with private provision then there is no underprovision. Finally, if the private contributions are being driven by private co-benefits rather than by demand for the public good, then private provision may be efficient. I return to this in Scenario 4 below.

2.3 Scenario 3: Non-Cooperative Provision with Heterogeneous Development

The scenarios above draw on standard "text book" models of public goods and apply them to development. However, as noted earlier, development should not be modeled as a homogenous good but as a collection of heterogeneous goods. Development in Haiti does not necessarily have the same value to other states (i.e. does not provide the same utility) as development in Nigeria. While it is common to speak of "development" as a public good, as a concept it fails a basic aggregation test: each unit of "development" does not add equally to the collective good.

[11] See Sandler (2015, p. 208) for further discussion.

[12] See Sandler (2015).

Additionally, contributing states will place different weight on development in receiving states, and the rank ordering of these preferences can vary across the contributors. The expected bargaining problems associated with creating an institution can be magnified in this setting.

In order to demonstrate some key points, it is necessary to introduce a setup that allows slightly more complexity than the two-player, one good model. Each graph in Figure 3 is adapted from Cornes (2009).[13] Panel A represents the market for development in Country x (D_x) and Panel B represents the market for development in Country y (D_y). In this scenario there are three contributing countries, $i = A, B, C$ and each chooses an amount $d_{ix} \geq 0$ to contribute of the public good, D_x and $d_{iy} \geq 0$ to contribute of the public good D_y. Following Cornes (2009) replacement functions are defined such that $\hat{d}_{ix} = r_i(D)$ represents the best response of i to $D_{-i,x} = D_x - \hat{d}_{ix}$, and are defined analogously for development in Country Y in Panel B. In Figure 3, the replacement function for each country intersects the 45$^{\text{o}}$ line from the origin at the "stand alone" value for the country: the value the country would contribute if it were the only contributor (countries that would never contribute are not shown). The negative slope of the replacement functions depicts the declining contributions for any individual country as contributions by other countries increase. The curves $R(D_x)$ and $R(D_y)$ represent vertical aggregation of the replacement functions. The non-cooperative Nash equilibrium occurs where $R(D)$ intersects the 45$^{\text{o}}$ line, with the resulting provisions of D_{Nx} and D_{Ny}. The situations depicted in the two panels in Figure 3 are identical except for the order of the replacement functions.

In Panel A, at the Nash equilibrium Country A and Country B both contribute to the public good of development in Country X (D_x), but Country C does not contribute because its replacement function intersects the horizontal axis at $D_x < D_{Nx}$: the best response of Country C to $D_x = D_{Nx}$ is zero provision. In Panel B, Country A and Country C contribute to the public

[13]Cornes (2009), Figure 2. See also, Cornes and Hartley (2007).

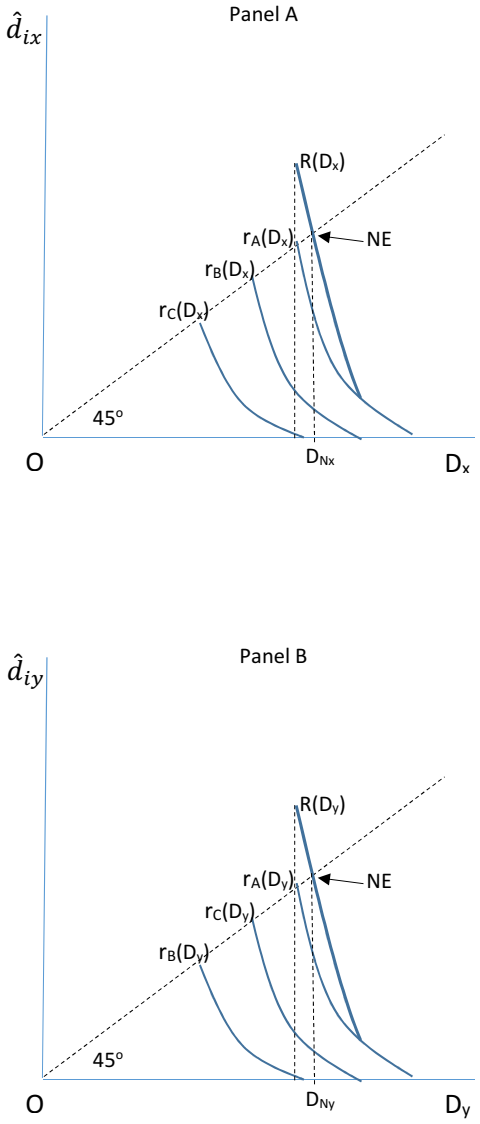

Figure 3: Private Provision, Heterogeneous Preferences, Heterogeneous Development. Adapted from Cornes (2009), figure 2.

good of development in Country Y (D_y), but Country B does not contribute. Assuming no private co-benefits (addressed below), development is underprovided to both Country X and Country Y. In the case of Country X, Country A and Country B both contribute until $MPB = MC$, at which point $MSB \geq MPB_A + MPB_B > MC$. Similarly, for Country Y $MSB \geq MPB_A + MPB_C > MC$, where the "greater than or equal to" acknowledges the possibility of additional benefits to the non-contributing state.

When Panel A and Panel B are each at the Nash equilibrium, it must be true that $MU_{A(x)} = MU_{A(y)}$; since Country A is contributing to both Country X and Country Y, the optimum allocation of its resources must be such that at the margin Country A is indifferent between investing in Country X or Country Y. If this were not true, Country A could increase its utility by reallocating its resources toward the country that provided the higher marginal utility. This means that if an institution is created to lower underprovision, Country A will be indifferent as to whether the next dollars are spent in Country X or Country Y. Country B will prefer new funding to be spent in Country X first, while Country C will prefer spending in Country Y. Clearly a deal can be struck so that both Country B and Country C are happy. However, in creating an institution that encompasses "development" the usual bargaining problems over funding are augmented by an additional bargaining problem over the distribution between Country X and Country Y. While economies of scale suggest that individual institutions for each country would not be cost-efficient, the increased scope of the bargaining problem adds to the complexity, making collective action more difficult.[14] However, in the absence of private co-benefits, an institution can be welfare improving if the bargaining problem is not too difficult and if transaction and maintenance costs of an institution are not prohibitively large.

2.4 Private Co-Benefits

One of the important advances in theorizing regarding the provision of public goods incorporates the existence of private co-benefits, resulting in what Cornes and Sandler call the "impure public

[14]Olson (1965). See also Mayer (2014).

goods" model or the "joint product" model.[15] I draw on a simple form of this model as set out in Buchholz and Sandler (2016). To start with, consider a single actor, Country A, deciding on the amount it wants to contribute to a single public good, D_x. Country A has a total income of w_A, which it spends on some combination of D_x and a private good, k_A; its expenditure on D_x is $d_{Ax} = w_A - k_A$. In addition to receiving utility from the total quantity of the public good (regardless of which countries provide it), Country A also receives a private co-benefit for any amount of the public good that it provides; it does not receive this private benefit for any amount of the public good provided by others. Country A's utility function can be written as:

$$u_A(k_A, D_x) = v_A(k_A, D_x) + \beta_A h(w_A - k_A) \tag{1}$$

where $v_A(k_A, D_x)$ is the utility Country A receives from spending on the private good, k_A and the total provision of the public good, D_x. The expression $\beta_A h(w_A - k_A)$ captures the private benefit Country A receives from providing d_{Ax}; $h(\cdot)$ is a function of Country A's contribution to D_x and it is weighted by the scalar $\beta_A \geq 0$ to capture the strength of the private benefit to Country A. To maximize utility of its expenditure across k_A and D_x, Country A allocates its resources w_A so that the marginal utility of an additional unit is equal across the two goods:

$$\frac{\delta v_A(k_A, D_x)}{\delta D_x} = \frac{\delta v_A(k_A, D_x)}{\delta k_A} - \beta_A h'(w_A - k_A) \tag{2}$$

Rearranging:

$$\frac{\delta v_A(k_A, D_x)}{\delta D_x} + \beta_A h'(w_A - k_A) = \frac{\delta v_A(k_A, D_x)}{\delta k_A} \tag{3}$$

Note that Country A may unilaterally decide to continue providing D_x past the point where this is "optimal" based on public benefits alone if the private benefits are high enough. If $\frac{\delta v_A(k_A, D_x)}{\delta D_x} + \beta_A h'(w_A - k_A) > \frac{\delta v_A(k_A, D_x)}{\delta k_A}$ when $\frac{\delta v_A(k_A, D_x)}{\delta D_x} = 0$, Country A will continue to supply D_x even though it receives no additional benefit from the public nature of the good;

[15] Cornes and Sandler (1984, 1994).

provision is being driven only by the private benefit. This has important implications for thinking about underprovision in the realm of development, which certainly includes some situations in which a public and private good are jointly produced by the same expenditure.

Returning to Scenario 2, recall that with multiple suppliers of the public good and no private co-benefits the resulting provision was sub-optimal because $MSB > MC$ at the resulting provision. With private co-benefits this need not hold. The presence of a private co-benefit increases the supply of the good beyond what would be justified based only on $MPB = MC$ in the absence of these benefits. It is possible that the socially optimum amount of the good is provided before the private benefit rationale for providing it is exhausted. In this case, the "market" provides an efficient amount (accounting for both the private benefit and the public benefit). There is no market failure for an institution to correct. This can be true (or not) for Countries X and Y in Scenario 3 as well. If A, B, and C (or some subset) are driven by private co-benefits to provide the socially efficient amount of the public good, then Scenario 3 looks more like a division of labor in which industrialized states specialize in providing development in the countries from which they receive private co-benefits rather than a complex situation of under-provision in need of an institution to sort it out.

This is not to argue that private co-benefits are always present or that, when present, they will always be high enough to ensure efficient provision. Instances of Scenarios 1-3 persist, and underprovision results. The likelihood of Scenario 4, however, has implications for optimal institutional design, to which I now turn.

3 Private Co-Benefits and Institutional Design

The presence of strong private co-benefits in a subset of an issue area that also has characteristics of a public good creates a situation in which a broad-based international institution is unlikely to yield the best results. Instead, policymakers seeking to minimize underprovision should insulate those portions of the issue area characterized by underprovision from those in which high private co-benefits are present. Not only is no institution needed to counter underprovision in the latter

case, but including both types of situations under the same umbrella will likely result in fewer resources for the underprovided goods than they would receive in an environment isolated from strong private co-benefits.

To take an example, suppose Country A receives high private co-benefits from development in Country X, no other country receives private co-benefits from Country X, and Country A does not receive these benefits from any other country. At equilibrium, Country A is unilaterally supplying more development assistance to Country X than would be optimal if only public benefits were considered. Now suppose a proposal is put forward to create an institution that centralizes development resources, in an effort to coordinate and decrease underprovision. Country A's preferences are such that it will either not agree to this arrangement, therefore maintaining its own status quo and not contributing to the provision of underprovided public goods, or it will agree to join only if it is given enough power to ensure that funding is not cut to Country X (other contributing countries do not benefit from this high level of funding, but it is important to Country A).

In an effort to get Country A to join, other countries could agree to a power structure that allows Country A to ensure the status quo provision to Country X. This might take the form of greater voting weight, for example. So far, this does not make anyone worse off and, to the extent that Country A and the other contributors can now coordinate on scenarios of underprovision, this could represent an improvement over the status quo. The problem arises in that Country A is now unable to commit not to use its enhanced power in situations not related to maintaining the status quo for Country X. This will skew all decisions toward Country A's optimum, even those where new funding has been contributed to provide previously underprovided goods. Committing to pursue the common good over individual self-interest, as is required to tackle problems such as those depicted in Scenario 1, is no longer credible for Country A. Realizing this, other countries may scale back their contributions. Some of the benefit of the institution as a commitment device has been sacrificed.[16]

[16]Stone (2004, 2008) looks in depth at deviations from "normal" decisions at the IMF in order to

Consider instead that an institution is created to coordinate funding in situau0(in)-2likeing

underprovision in a non-cooperative setting, even powerful states lack "attractive outside options": action requires coordination. For this coordination to be effective, and for the institution to have a chance at serving as a commitment device that is respected by all actors, the areas of underprovision where cooperative outcomes are preferred must be separated from parts of the broader issue areas where preferences are "intense." This is even more attractive since the areas with high private co-benefits are those where underprovision is least likely to be a concern.

The above arguments have implications for the optimal design of institutions seeking to promote development abroad. At times policymakers, activists, or scholars bemoan the inefficiency of bilateral aid at promoting development, and the argument is sometimes made that aid should be more coordinated through an international institution, such as the World Bank, to increase its effectiveness. This would suggest that a larger role for the World Bank (or a new institution) would better serve to promote the public good of development. The analysis here suggests that the opposite is likely to be true. If an international institution wishes to increase development outcomes it should be limited in scope, focus on areas of underprovision, and exclude from its mandate areas where private co-benefits (particularly for powerful states) are large. The most efficient division of labor in the issue area is likely unilateral action in areas of high interest coupled with complementary multilateralism that seeks to fill the gaps, rather than coordinate more broadly.

A development institution with a broad mandate becomes one more venue for powerful countries to exert their influence. In the years surrounding the signing of the Camp David Accords, bilateral aid to Egypt rose sharply, but so did loans from the World Bank. This was not due to a sudden rise in the public value of Egyptian development, catered to by a development-focused international institution. Rather, powerful players were able to use the World Bank to support their own self-interest. Had the World Bank not existed, the United States and its allies would undoubtedly have still found ways to compensate Egypt for its cooperation. But since it did exist, and as World Bank assistance could serve as a partial substitute for bilateral effort, some of the cost of buying Egyptian cooperation was borne by the institution. Several

studies have made similar claims, finding that the World Bank, International Monetary Fund and regional development organizations deviate from stated objectives when it is in the interests of one of their powerful shareholders.[17]

Institutions will retain more autonomy to act in a pro-development manner if they are designed as complements to, rather than as substitutes for, bilateral development efforts. Currently, multilateral development institutions often work in the same issue areas and same countries as bilateral efforts.[18] There is very little division of labor. These institutions would be less susceptible to cooption by the powerful if they were seen less as substitutes for the actions of powerful countries and more as complements, working in areas that are underprovided by the "market" because they are of less particular importance to powerful states.

To the extent that powerful players actually want to tie their hands to obtain a cooperative outcome, it is incentive compatible for them to agree to form smaller institutions to operate in areas of underprovision, excluding those areas of high private co-benefits. If the public good is "worth it" to a powerful state, then it will reallocate funding toward this goal, whether from its bilateral development funding or from other sources. The two issues are separate, one providing a private benefit, the other a public good. From the point of view of maximizing utility, it does not matter that the two goods are lumped together in an issue area called development. If the powerful state decides to contribute to the cooperative effort to fund the public good it will reallocate funds from the activity that currently provides the lowest benefit, whether or not that is in the realm of development.

International institutions focusing on development, like the World Bank, are approaching a cross-roads. It is increasingly clear that they need to adapt to remain relevant, as a large number of previously important clients have less current need for their services. They also face criticism

[17]Stone (2004, 2008, 2013); Vreeland (2007); Dreher, Sturm and Vreeland (2009); Lim and Vreeland (2013).

[18]See, for example, Findley, Milner and Nielson (2017).

for their out-dated voting structures, which reflect power dynamics of the past. The analysis here suggests that changing the mandate and power structure of the World Bank should proceed in tandem. Activities of the World Bank are skewed toward the interests of its most powerful members, which means the Bank disproportionately operates in areas of importance to these countries. Given this, these countries are particularly reluctant to give up voting power, but until they give up voting power they cannot commit to stop skewing the Bank's activities for their own benefit. Revising the Bank to focus more on public goods where private benefits are less intense would decrease resistance to changes in its voting structure; changes in its voting structure could decrease the self-interested distribution of World Bank programs. While any changes will be difficult, approaching changes in the mandate and voting structure in tandem may have a greater chance of gaining traction.

Finally, the analysis above can shed light on broader debates in international relations regarding the role of institutions. Some scholars argue, along the lines of Mearsheimer (1994/95) or Gilpin (1981), that institutions are simply a vehicle for the strong to assert their influence and gain another source of advantage for serving their interests in the international arena. Olson and Zeckhauser (1966), on the other hand, argue that in institutions that provide collective goods the most powerful may be "exploited" by weaker states in that their portion of the cost may be higher than their share of the benefits: the disproportionate burden of NATO borne by the United States is given as an example. The logic above suggests these are both true. In areas where private benefits are high, powerful states use institutions to enhance their influence. In areas comprised mainly of public goods with few private benefits, institutions can help achieve cooperative solutions. For the latter to occur, it is necessary that these institutions maintain their independence from areas rich in private co-benefits.

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