THE WORLD BANK GROUP ARCHIVES

PUBLIC DISCLOSURE AUTHORIZED

Folder Title: Truman, Edwin - Articles and Speeches (1969) - 1v

Folder ID: 1654749

Fonds: Records of Office of External Affairs (WB IBRD/IDA EXT)

Digitized: March 04, 2014

To cite materials from this archival folder, please follow the following format:
[Descriptive name of item], [Folder Title], Folder ID [Folder ID], World Bank Group Archives, Washington, D.C., United States.

The records in this folder were created or received by The World Bank in the course of its business.

The records that were created by the staff of The World Bank are subject to the Bank's copyright.

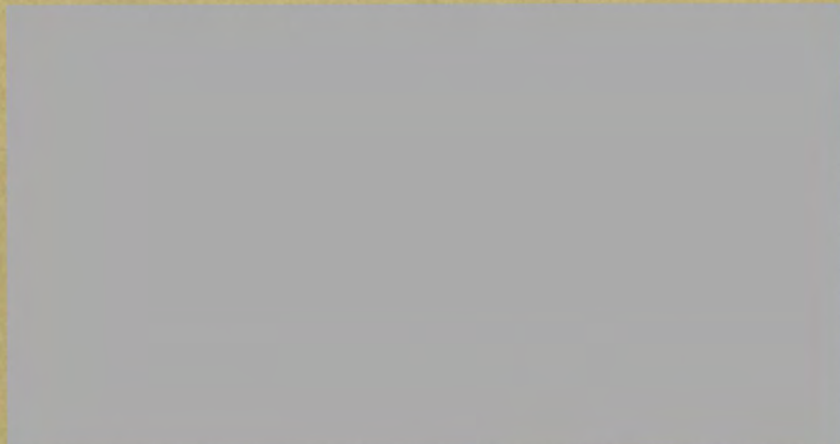
Please refer to http://www.worldbank.org/terms-of-use-earchives for full copyright terms of use and disclaimers.

THE WORLD BANK
Washington, D.C.

© 2012 International Bank for Reconstruction and Development / International Development Association or
The World Bank
1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

PUBLIC DISCLOSURE AUTHORIZED

TRUMAN, EDWIN - Articles and Speeches (1969)



The World Bank Group
Archives
1654749
A1992-007 Other #: 19 212064B
Truman, Edwin - Articles and Speeches (1969) - 1v

DECLASSIFIED
WBG Archives

May 1969

The Multilateral Untying of Economic Aid

Edwin M. Truman
Yale University
Prepared for the Commission on International Development

		Page
I.	Introduction and Summary	1
II.	Multilateral Aid Untying with Zero Balance of Payments Effect	6
	A. General Considerations	6
	B. Estimates of Feasible Untying	8
	C. The Organization of a Multilateral Untying Arrangement	14
	D. Membership in the Untying Arrangement	24
III.	Multilateral Aid Untying with Non-Zero Balance of Payments Effect	26
IV.	Conclusion	29
	Appendix	32
	A. Analytical Solution of the Multilateral Untying Problem	32
	B. Application of the Solution Process	34
	C. Computation of the Expenditure Shares Under the Extended Plan	35
	D. Target Adjustment for Settlement Account Imbalance	37

The Multilateral Untying of Economic Aid *

I. Introduction and Summary

Since the early 1960's the growth of formal and informal methods of tying foreign economic assistance payments to purchases in donor countries has led to an increased bilateralization of trade between the developed and the developing countries. In 1967, for example, over 27 percent of the exports of the ten major donors to less developed countries (excluding petroleum exporters) were accounted for or were directly influenced by tied aid.[1] Furthermore, this statistic understates the gross impact of donor government policies to the extent that the donors employ additionality criteria based on gross trade flows in distributing their aid. If the developing country in order to receive a marginal dollar of aid must guarantee not only to spend that dollar in the donor country but

---

*I have found the advice and criticism of Benjamin Cohen, Jon Cohen, Richard Cooper, and Gustav Ranis, all of Yale University, along with access to some of the unpublished work of Alan Strout of the Brookings Institution, particularly helpful in working on this topic. The opinions expressed are my own, however, and should not be attributed to any of the above or to any of the organizations to which they or I belong or have belonged. Any mistakes are, of course, also my own responsibility.

[1]Included in tied aid are tied program or project loans or grants, gifts of commodities, sales of commodities for local currency, plus public and private export credits. The ten donors referred to are all members of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD). They are (in descending order of their shares of total DAC gross, official aid disbursements in 1967): the United States, France, Germany, the United Kingdom, Japan, Italy, Canada, the Netherlands, Belgium, and Sweden. These countries made 95.7 percent of total DAC gross, official aid disbursements in 1967 and form the basic group of donor countries considered in this paper. The aid data used in this paper are drawn primarily from Development Assistance Efforts and Policies, (1967 and 1968 Reviews), OECD. The source for the trade data used is Direction of Trade, Annual, 1963-67.

also to spend it in addition to the present expenditure level or even share, then the effect of the marginal aid dollar is to freeze the entire trade share. This bilateralization is, however, asymetrical; the donor country does not agree to maintain the recipient, developing country's share of its own import market.

The increased tying of aid and bilateralization of trade imposes three kinds of costs on the aid-receiving country. First, aid tying often not only requires that developing countries purchase goods from a donor at prices above those ruling in competitive world markets but it also permits oligopolistic exporters to sell at prices above those ruling in the domestic market of the donor.[1] Second, the tying of aid also encourages the adoption of technologies which are inappropriate for the country involved, imposing a cost in terms of a lower net social productivity for the project. Finally, to be effective, aid tying requires control mechanisms whose costs are usually borne by the recipient country. These costs take three forms: misallocation of often scarce administrative talent, expenditure of actual or potential government revenues in subsidizing non-competitive imports, and the perpetuation of government controls over investment and foreign exchange use which may be inconsistent with the development objectives of the country.

In the second-best world in which aid tying policies are applied, such policies may, nevertheless, benefit the recipient country in two ways. First, tying may encourage the importation from what are the true

---

[1]See Jagdish N. Bhagwati, "The Tying of Aid," UNCTAD, II, TD/7/Supp. 4, November 1967.

low cost suppliers who were previously unknown due to imperfect information. Second, the real social benefit of the aid flow may exceed the cost of aid tying. As a general rule, however, the net benefit for most recipient countries would be increased by any relaxation of aid tying by the major donor countries.

While aid tying for the essentially mercantilist objective of export promotion is not a new phenomenon, the recent adoption of more extensive aid tying policies by the donor countries has been either in response to current, or what are perceived as potential, balance of payments difficulties, or as a reaction to the adoption of such policies by competitors. In 1967, none of the ten major DAC donors disbursed less than 60 percent of its total gross official aid on a tied basis. The weighted average for the ten donors was 85.1 percent (Table 1).[1] In the face of the actual or feared balance of payments consequences for individual donors of untying aid, the best prospect for a relaxation of restrictions on the expenditure of aid is through the coordinated efforts of the major donor countries. Consequently, the objective of this paper is to explore a possible multilateral arrangement for a partial untying of economic aid.

The paper is concerned only with official bilateral aid. The scope of the paper is further restricted by excluding from consideration official bilateral aid in the form of technical cooperation, resource

---

[1]Assuming all multilateral aid was untied, 92.5 percent of bilateral gross official aid was tied.

Table 1

Gross Official Aid Disbursements and Tying, 1967

Country	Total Gross Official Aid Disbursements[a] (Million U.S. $)	Gross Official Tied Aid Disbursements Percent	Gross Official Tied Aid Disbursements (Million U.S. $)[b]
United States	4130.0	96.5	3985.5
Japan	414.8	86.6	359.2
Germany	678.3	60.0	407.0
United Kingdom	578.1	64.6	373.5
France	908.9	68.5	622.6
Italy	311.8	72.6	226.4
Canada	231.1	100.0	231.1
Netherlands	114.5	67.8	77.6
Sweden	60.0	85.8	51.4
Belgium	98.8	66.2	65.4
Total Above	7526.3	85.1[c]	6399.7
DAC Total	7863.9	83.7[c]	6582.1

Source: Development Assistance Efforts and Policies, (1968 Review), OECD, pp. 260-1 and 268-9.

[a]Includes both bilateral and multilateral aid.

[b]For the purposes of the paper, it is assumed that these flows are exclusively bilateral, although some grants to the European Development Fund and the Inter-American Development Bank are in fact tied.

[c]Weighted average.

[d]This figure includes data on 16 DAC countries.

transfers through sales or loans repayable in recipients' currencies, and, to the extent possible, official export credits.[1] All three of these categories of assistance definitely come under most definitions of tied aid, but they have been excluded here from the total of official aid eligible to be untied, or, for short, "eligible aid." Technical cooperation grants present special and complicated problems of definition and are too closely tied with prestige motives for aid giving to be included here. The second category of excluded bilateral assistance is almost exclusively United States aid under PL 480 programs which are being phased out. Export credit programs are, again, very delicate and difficult, therefore, to handle.[2]

---

[1]The second exclusion includes the DAC categories: "loans repayable in recipients' currencies" and "the transfer of resources through sales for recipients' currencies." Data on official export credits are given in the DAC tables for only Australia, Canada, Germany, Italy, and the United States, and these data are "official export credits as a percentage of total bilateral commitments," rather than disbursements. Assuming disbursements correspond closely to commitments, which they do not, official export credit disbursements have been estimated for the four relevant countries, excluding Australia.

[2]Export credits are a traditional means of export promotion which have only recently become identified with and often indistinguishable from other forms of aid. This identification is misleading where they are, in fact, subsidies to exports. While any attempt at untying these credits might well lead to a net reduction in real aid flows, the aggressive manipulation of export credits primarily by the exporters in developed countries often represents a deceptive device for developing countries with short time horizons, limited liquidity, and inadequate knowledge of technologies. A more appropriate treatment of export credits than their inclusion in a general untying arrangement would be an attempt by the donor and recipient countries to bring them under the umbrella of comprehensive aid and foreign exchange policies where they are a bona fide element of aid programs. Where they are merely an export promotion device, the terms for the developing countries should be as reflected in the money market conditions of the exporting country.

Two premises underlie the discussion which follows. First, the balance of payments motive for aid tying is natural and unavoidable as long as the international adjustment mechanism is imperfect. That is, countries are not able to correct their surplus or deficit positions in their international balance of payments quickly and effectively. Second, while national policy makers are understandably concerned with the balance of payments implications of their aid programs, the objective is or should be to ensure that the net impact of these programs on their balance of international payments is negligible. The developing countries should not be made to pay for the existence of an imperfect world in reduced real aid flows; when the United States' share of world trade is declining consistently throughout the world, the developing countries should not as a condition of their continued receipt of aid be required to maintain the U.S. share in their markets.

In Section II of this paper, arrangements are explored for the multilateral untying of aid in such a way as to leave the balance of payments of each donor unaffected. First, an outline of the general principles underlying such a plan are discussed. Next, estimates are presented of the extent of the untying which might be achieved under various alternative assumptions about the structure and operation of the untying. Finally, an outline is given of a proposed Untying Arrangement; how it might operate and what are some of the open alternatives. Finally, the issue of size of the membership in the Untying Arrangement is addressed.

Section III of this paper extends the discussion of Section II to arrangements under which the expected balance of payments effects are

not zero, but predictable. Under this more complex and more ambitious proposal, donor countries in balance of payments surplus could untie more of their aid and not only earn credit against possible later deficits, but also facilitate further untying by other donor participants whose balance of payments positions are not so favorable. Alternatively, the arrangement might permit donor countries in deficit to untie more of their aid but receive temporary credits from donors in surplus. In this way, aid untying can contribute to the general balance of payments adjustment process.

II. Multilateral Aid Untying with Zero Balance of Payments Effect

A. General Considerations[1]

In principle, the problem of an adverse balance of payments effect from untied aid arises from the fact that the aid recipients do not spend the aid directly or indirectly in the donor countries in the same proportion in which it is received from them. In particular, the United States made 55 percent of all the aid contributions by the ten major DAC donors in 1967 (Table 1), while its average share of exports by the ten donors to the less developed countries was less than 40 percent (Table 2).[2] Under these circumstances, U.S. aid finances exports from other countries.[3] To put the problem the other way around, if the major donors' aid shares were

---

[1] A formal analysis of the simple problem outlined below is presented in the Appendix.

[2] The latter figure is an average for 1966 and 1967. Throughout this paper, "1966-67" refers to this two year average. The U.S., 1966-67 share of tied aid by the ten donors was 60.1 percent (Table 2).

[3] Trade in invisibles (services) is ignored here as it is throughout the paper.

Table 2

Aid and Trade Data for Ten Major Donors
(1966-1967 Average)

	Tied Aid[a]		Adjusted Exports to LDCs[b]		Gross Exports to LDCs[c]	
Country	Million U.S. $	Share	Million U.S. $	Share	Million U.S. $	Share
United States	2,198.4	61.6%	5,229.5	30.8%	8,671.6	37.4%
United Kingdom	315.4	8.8	2,404.6	14.1	2,858.8	12.3
Japan	305.7	8.6	3,348.5	19.7	3,987.9	17.2
Germany	193.6	5.4	1,780.6	10.5	2,286.3	9.9
France	192.3	5.4	2,023.1	11.9	2,393.2	10.3
Canada	167.1	4.7	363.8	2.1	578.6	2.5
Italy	78.3	2.2	560.3	3.3	970.6	4.2
Netherlands	57.8	1.6	562.4	3.3	634.0	2.7
Sweden	39.1	1.1	276.1	1.6	330.1	1.4
Belgium	22.8	0.6	448.0	2.6	498.3	2.1
TOTAL	3,570.3	100.0	16,996.9	100.0	23,209.4	100.0

Sources: Development Assistance Efforts and Policies (1968 Review), OECD; Direction of Trade, Annual 1963-67. Totals may not add because of rounding.

[a] Gross official bilateral tied aid (Table 1) less (a) technical cooperation grants, (b) loans repayable in recipients' currencies, (c) transfer of resources through sales for recipients' currencies, and (d) estimated official export credits. There is a small degree of double counting involved in the second two items.

[b] Gross exports less tied aid in the form of gross official bilateral aid and net private export credits plus item (a) in footnote a. These shares assume that the trade financed by nominally tied aid and private export credits is 100 percent "additional."

[c] Exports to all less developed countries excluding oil exporters. The total for the ten countries represents 89.4 percent of all exports of industrial countries to these countries.

determined by their shares in the expenditures of the recipient countries, there would be no direct balance of payments impact associated with the aid flows.[1]

If we knew or could guarantee how the recipient countries would spend their marginal untied aid, a plan could be formulated under which the major donors could untie part of their aid and experience no direct, adverse balance of payments impact. We would require only that the balance of payments loss to each donor from untying would be offset by its gain from the untying of other participating donor countries. The recipients of the newly untied aid would be allowed to spend it only in the donor countries participating in the program.[2]

For example, if the United States was to untie one dollar of its presently tied aid, it would generate directly roughly thirty-five cents worth of exports.[3] If all the other donors collectively untied $1.86 of their aid and the recipients spent it on the United States' exports in the same proportion as they spent the U.S. untied aid collar, then

---

[1]If the aid transfers were not fully affected in real terms and caused inflation in the donor country or there were a differential import content in exports of the donors to the LDCs, then there might still be an indirect balance of payments effect associated with aid.

[2]The program involves, therefore, not the complete and unrestricted untying of aid but a broadening of the present tying restrictions.

[3]The range of the two average export shares in Table 2 is between 30.8 and 37.4 cents.

this untying by the other donors would offset the direct loss to the United States of its untying.[1]

In any untying arrangement we would require that the condition outlined and illustrated in the two preceeding paragraphs be maintained for all the participating donor countries. No donor would, therefore, experience a direct balance of payments loss as a result of the untying. The untying could proceed until one of the participating countries has untied 100 percent of its presently tied aid. I will call this country the "binding country."

B. Estimates of Feasible Untying

1. Basic Estimates

Under the constraint that no country's balance of payments is to be directly affected, how much of their presently tied aid could the ten major DAC donor countries untie? The answer to this question depends upon what assumptions are made about (a) what or how much aid is eligible to be untied and (b) how the recipient countries will spend the newly untied aid.[2] The first type of assumption is only relevant, *ceteris*

---

[1]The initial loss to the United States from untying is $1. The immediate exports are $.35. The exports generated by other donors' untying are $.65 = .35 x $1.86. I am ignoring here, as I will throughout the paper, the possibility of an indirect increase in U.S. exports due to the spending of the initial $.65 of the first U.S. dollar of untied aid in other countries who may in turn spend some or all of it in the United States. Note also that at this point the recipient countries are being treated as a single country, *i.e.*, it is assumed that on average the increase in U.S. exports from untying a dollar of U.S. aid is the same as the increase in U.S. exports from the untying of a dollar of non-U.S. exports. This assumption is relaxed in Section II.B.2.

[2]As is discussed in the Appendix, we must make certain further assumptions about the distribution of aid or of aid untying and about the consistency across recipients of expenditure patterns on donor country goods.

paribus, to this investigation insofar as altering the definition of eligible aid changes the identification of or the level of eligible aid for the "binding country."

I will adopt for illustrative purposes the definition of eligible aid outlined in Section I. That is, all presently tied, official bilateral aid will be eligible to be untied except technical cooperation grants, transfers of commodities through sales or loans for recipients' currencies, and official export credits. The data corresponding to this definition are presented in Table 2. With this definition of eligible aid, two alternative assumptions about how the untied aid will be spent are considered.

Assumption 1: The recipient countries will spend their untied aid on the exports of each donor country according to the pattern indicated by the donor country's adjusted average share in the exports of all participant donors to all less developed countries excluding petroleum exporters. These shares are "adjusted" by removing all exports which might be directly influenced by aid tying including in this case private as well as public export credits.

Assumption 2: The recipient countries will spend their untied aid as indicated by the gross average export shares of the donors.

These two assumptions reflect two extremes: tying is either 100 percent effective or completely ineffective, where effectiveness is measured in terms of a one dollar addition to exports for each dollar of aid tied. This measure of effectiveness (100 percent additionality) is extreme. Moreover, it is unlikely that the level of effectiveness of

tying (by any measure) is the same across donors. What is needed is an export share reflecting marginal (not average) expenditures out of effectively (not nominally) untied exchange earnings. To the extent that, for example, the true effectiveness of U.S. tying is large relative to other donors,its share would be even lower than the "adjusted" share employed for the estimates under Assumption 1. (See Table 2.) Note, finally that the assumption of zero effectiveness (Assumption 2) is the same as saying not only that the only costs to tying are the (large) administrative costs imposed on the donors and recipients and the price inflating costs due to the tied procurement,but also that there are no benefits other than those due to better information or legislators' preferences for nominally tied aid leading to a larger volume.

If the untied aid were spent according to the donor countries' 1966-67 adjusted average shares (Assumption 1), a maximum of 24.2 percent or $864.5 million of the 1966-67 total eligible tied aid ($3,570.3 million) could be untied without direct adverse balance of payments impact on the participating donors (Table 3).[1] Using the same definition and data on eligible aid but the 1966-67 gross average exports shares (Assumption 2), the maximum amount of aid which could be untied rises to 29.7 percent of the total or $1,061.5 million.[2] Most of the difference between these two

[1]Note that these are estimates of the maximum amounts and percentages of aid which could be untied under the stated assumptions with the constraint that no country can untie more than 100 percent of its presently tied, eligible aid. If Belgium (the "binding country" in the example), were to untie only 50 percent of her eligible aid, each of the other participating donors could untie only half as much of its aid.

[2]This represents an increase of $197 million or 22.8 percent over the amount which could be untied under Assumption 1.

Table 3

Estimates of Maximum Multilateral Aid Untying with Zero Direct Balance of Payments Impacts on the Participating Donors

Country	Eligible Tied Aid[a] (1966-67 Average) (million US$)	Assumption 1[b] Aid Untied (million US$)	Assumption 1[b] Aid Untied As % of Eligible Aid	Assumption 2[c] Aid Untied (million US$)	Assumption 2[c] Aid Untied As % of Eligible Aid
United States	2,198.4	266.0	12.1	396.6	18.0
United Kingdom	315.4	122.3	38.8	130.8	41.5
Japan	305.7	170.3	55.7	182.4	59.7
Germany	193.6	90.6	46.8	104.6	54.0
France	192.3	102.9	53.5	109.5	56.9
Canada	167.1	18.5	11.0	26.5	15.8
Italy	78.3	28.5	39.4	44.4	56.7
Netherlands	57.8	28.6	49.5	29.0	50.2
Sweden	39.1	14.0	35.9	15.1	38.6
Belgium	22.8	22.8	100.0	22.8	100.0
TOTAL	3,570.3	864.5	24.2	1,061.7	29.7

[a] See fn. a, Table 2.

[b] In making these estimates it was assumed that the recipient countries would spend their untied aid in the participating donor countries as indicated by the donor countries' 1966-67 "adjusted average share" in the exports of the ten participating donors to all less developed countries except petroleum exporters. The export figures were adjusted by removing all exports as a result of tied aid including the "eligible aid" figures above, plus public and private export credits, loans repayable in recipient countries' currencies, and transfers of resources through sales for recipients' currencies. (See Table 2.)

[c] In making these estimates the same gross trade figures were used as described in fn. b above, but not adjusted for the "influence" of tied aid. (See Table 2.)

estimates is due to the increased degree of untying permitted for the United States, since its gross average share is 37.4 percent and its adjusted average share is 30.8 percent (Table 2).[1] These two estimates suggest that the amount of aid which could be untied is quite sensitive to the assumption made about how the newly untied aid will be spent by the recipients.[2] These figures on the amount of additional aid which might be untied can be compared with the actual amount of untied official multilateral and bilateral aid disbursed by the ten donors in 1966-67. This amount was only $1,045.7 million.

2. Alternative Estimates

a. The basic estimates presented above employed an expected expenditure pattern for the aid recipients as reflected in the trade of all or most of the less developed countries treated as a single spending

[1] Note that the amount of aid untied under the two assumptions is distributed exactly as the underlying expenditure shares as given in Table 2. Besides the United States, Canada is the only other donor country of the ten included participants whose aid share consistently exceeds its trade or expenditure share; see, for example, Table 2.

[2] These basic estimates change only slightly if the 1967 and the 1966 trade and aid data are not averaged. The results for each year are as follows:

	Maximum Aid Untied ($ million)	
	1967	1966
Assumption 1	967.6	762.3
Assumption 2	1179.7	942.4

There is, likewise, little change in the results if export shares to all less developed countries, not excluding petroleum exports, are used. For 1966-67, data between $889.3 million (Assumption 1) and $1,055.8 million (Assumption 2) could be untied under these estimates.

unit. There are several problems with this method of estimation. First, the share of each developing country in total DAC aid disbursements is not the same. Second, these shares are not even the same across donor-recipient pairs. The United States gives proportionately more aid to Latin America than the British. Third, tied aid flows to different recipients are not proportionate to total aid flows. Finally, the expenditure shares of each recipient country are not the same across donors.

Given the availability of published data, it is difficult to judge the implication of each of these problems in terms of the reliability of the estimates already presented. One method of imperfectly taking into consideration these problems is to disaggregate the less developed countries and use in the estimation procedure weighted export shares.[1] Using the weighted export shares and the 1966-67 eligible aid data, yields an estimate of $912.0 million or 25.5 percent of the ten country total eligible aid which could be untied.

This result should be compared with the basic estimate of trade untying under Assumption 2, since the trade shares were not adjusted for the influence of previous tying. On this basis the estimates are less

---

[1] 1967 trade data were used for nine recipient areas: Latin America, other developing countries in the Western Hemisphere, Israel and Jordan (no other Middle-East countries were included), India and Pakistan, other developing countries of Asia, the Congo (Democratic Republic), British Africa, French Africa, and other developing countries of Africa. (Data source: Direction of Trade, 1963-67.) The trade share of each donor in each recipient area was weighted by the share of the recipient in "Total Official [Aid] Flows (Net)" using an average of 1963 to 1966 data. (Data sources: Development Assistance Efforts and Policies [1967 Review, pp.192-3], [1968 Review, p. 271].) These weighted export shares were then added across the recipients. The resulting weighted average export shares summed to one across the donors.

encouraging than those presented earlier, but they still demonstrate that there is substantial potential for multilateral untying.

b. One criticism of aid-tying which has not been recognized by the untying schemes implicit in the estimates presented above is that these schemes restrict the growth of trade among the developing countries. In light of this criticism, a "feedback matrix" was computed allowing each recipient to spend the aid either in one of the participating donor countries or in one of nine recipient areas.[1] Under the assumptions of the exercise, all of the untied aid was eventually spent in one of the participating donor countries.

Using the results of the computation of this feedback matrix based on 1967 trade data along with the 1966-67 eligible aid data allows $923.1 million in untying.[2] In addition, allowing the recipient countries to spend the untied aid in other recipient countries as well as in the donor countries would generate $150 million in inter-recipient trade. This induced increase in trade among the less developed countries is a three percent increase over their 1967 level.[3]

3. Summary

According to the estimates presented above, the potential amount of what has been called the "eligible aid" of the ten major DAC

---

[1] The nine areas are listed in the previous footnote. The methodology of this approach is outlined in more detail in the Appendix.

[2] Compare these results with the basic estimates under Assumption 2.

[3] According to the estimates, $.163 in such trade is created for each dollar of aid that is untied.

donors which could be untied with zero or negligible direct balance of payments effects on the participating donors is large. It ranges from $762.3 million to $1,179.2 million and from 21.7 percent to 32.5 percent of the relevant "eligible aid" total of the ten donors. Given the substantial estimated potential for untying indicated, it is appropriate to explore how such an untying scheme could be organized.

Before I move on to this question, let me make one further general point. The direct gain from untying for the recipient countries will not take the form of increased aid flows in money terms, but in an increased real value of the money aid flow untied. If we assume for purposes of illustration that the money value of tied aid exceeds the real value of tied aid by 20 percent, then the untying of $864 million in aid (the basic estimate under Assumption 1) would increase the real aid flow by $144 million.[1] The increase in the real value of the fixed dollar volume of aid will occur primarily in the form of lower costs for imports and reduced administrative costs to the recipient countries.[2] The increase in the real value of the aid flow will in turn increase the productivity of the given money aid flow, speeding the development process and raising real growth in the recipient countries.

C. The Organization of a Multilateral Untying Arrangement

In order to accomplish the multilateral untying of aid along the lines of the procedure implicit in the estimates presented in Section II.B.

[1]The 20 percent estimate is based on those by Mahbub ul Haq, "Tied Credits: A Quantitative Analysis," in Capital Movements and Economic Development, John H. Adler, editor, St. Martin's Press, 1967, pp. 326-59; and J. Bhagwati, op. cit., pp. 32-6. It is intended only as an order of magnitude.

[2]See Section I.

it will be necessary to organize a formal scheme with two basic elements. First, the terms of the multilateral Untying Arrangement will have to be spelled out and an authority set up or an established organization chosen to maintain these terms and keep records on the operation of the program. Second, a mechanism will have to be agreed upon to handle any ex post diviation between the expected and the actual operation of the scheme. An outline of an Untying arrangement embodying these two elements is presented below.

1. Preliminary Steps

The first step which the major aid donors would have to take is to agree on what type of aid is to be considered eligible to be untied under the Arrangement. The simplest definition would include all tied project or program loans or grants to the extent that they did not involve technical assistance contracts, sales or loans of commodities for recipients' currencies, or export credits.[1]

Having agreed on the applicable definition of eligible aid, the members will have to establish the amount of such aid which each donor is prepared to commit during the "first stage" of the operation of the Agreement. A time period for the "first stage" will also have to be set. An appropriate time period would be two years. Given the long lag between aid commitments and disbursements, any shorter period would be impractical and any longer period might produce a reduction in the eligible aid donors are willing to have included. It would be hoped

---

[1] See Section I.

that each participating donor country would be prepared to commit as eligible aid at least as much as it had disbursed over the two years preceding the establishment of the program.[1]

The third step would be an agreement on the type of expenditure arrangement to be implemented. There are three possible variants.

(1) Basic Plan: Each participating donor agrees that its aid commitments under the Arrangement to any of the recipient countries can be spent not only in the donor country, but also in any of the other participating donor countries. The participating recipient countries would also have to make a similar agreement to restrict their purchases financed by the aid untied under the Agreement only to procurement in the participating donor countries.

(2) Restricted Plan: Each donor would agree to the same expenditure rules as under the Basic Plan, but each recipient country or designated groups of countries would be treated separately. While this plan has the advantage of reducing somewhat the uncertainty associated with the operation of the Untying Arrangement, it also entails a much more detailed multilateral involvement in the aid planning of the member donors.

(3) Extended Plan: The participating recipients would be permitted to spend the newly untied aid not only in the donor countries but also in the other participating recipient countries.

---

[1]Participating donors will continue to give untied aid outside the operation of the Untying Arrangement. It is to be hoped, in particular, that countries without pressing, balance of payments difficulties will continue or expand existing untied aid. It is, however, in the interest of any donor who grants some eligible tied aid to participate in the scheme to ensure the untying of other donors. The optimal number of participating donors will be discussed in some detail below, Section II.D.

Each of these variants involves, therefore, only a partial untying and depends for its scope on the number of participant donor countries and where expenditures are permitted.

Within the expenditure ground rules outlined under any of the variants, the participants must decide whether to use some kind of simple historical aggregate export shares of the donors, shares of exports to the various recipient countries weighted by recipient aid shares, or some more sophisticated set of estimates. Under the Extended Plan where spending is permitted in participating recipient as well as donor countries, estimates would, of course, be necessary of expected feedback ratios as described in Section II.B.2.b.

The final preliminary step would be to calculate the maximum permissible aid untying for each donor according to the procedure outlined in the Appendix, using the agreed upon levels of eligible aid and expenditure estimates. The participant donors would then have to decide how far they were willing to move collectively towards achieving this maximum level of untying.[1]

2. The Untying Arrangement in Operation

Having decided upon the maximum possible degree of untying, the target level of untying, the corresponding amounts to be untied by each participating donor, and the rules governing expenditures, each

---

[1] This collective decision about how far to go might be, for example, only 50 percent. In this case, the donor would untie only half as much aid as the exercise indicated they could.

donor would be assigned a Multilateral Aid Quota (MAQ) equal to its designated share of the total aid to be untied over the "first stage."[1]

The IBRD or IMF might be asked to keep track of the accounting under the Untying Arrangement. The former agency would be particularly appropriate since as a by-product it could provide centralized advising to aid recipients on procurement.

Each donor would agree to make over the period covered by the first stage of the Untying Arrangement commitments equal to its MAQ. As the aid commitment is made, the donor would make a deposit in its account in the name of the recipient country. It might be convenient to call such special deposits "Blue Money."[2] Thus, the donor maintains complete political control over the allocation of its aid under its MAQ.

The recipient country could then write checks against its assigned Blue Money deposit according to the rules adopted in the Untying Agreement. Once a disbursement is made, the Settlement Account of the country in which the purchase was made would be credited and the Settlement Account of the original donor would be debited.

The accounting agency would act, therefore, as a clearing house for aid payments. The use of Blue Money would ensure that there would

---

[1] Any country's eligible aid which is not included in the Untying Arrangement should, of course, still be disbursed, preferably on an untied basis but in any case outside the operation of the program.

[2] It would not be necessary that an actual deposit be made against the Blue Money deposit if each of the donors would stand ready to redeem Blue Money checks in its own currency for expenditures made within it.

be no direct leakage in the system. Recipient countries could not count the Blue Money in their reserves as it would be redeemable for them only in goods and services, as specified by the donor and the rules of the Agreement.[1]

3. Settlement and Subsequent "Stages"

At or near the end of the first stage of the operation of the Untying Arrangement, the donors would meet to decide on quotas for the next stage and carry out final settlement for the first stage.

In the Untying Arrangement as outlined in the body of the text in the previous section, the actual monetary settlement of an imbalance in each country's Settlement Account will have already taken place. A country with a net creditor position in its Settlement Account will merely have paid less into the operation of the Untying Arrangement than he has taken out. Conversely for the country with a net debtor position, the question will then merely be one of adjusting the operation of the Arrangement in the following stage to correct this imbalance. This adjustment could easily be accomplished by assigning to the net debtor countries of the first stage positive targets in the second stage and assigning negative targets to the first stage net creditors.[2]

---

[1]Furthermore, Blue Money aid need not produce any change in donors' reserves if each donor agreed to redeem Blue Money checks cashed within its borders pending final settlement. Under such an arrangement, the donor countries might, however, want to count in their reserve position their net settlement account position.

[2]As long as the sum of the targets is zero, the scheme will operate. See the Appendix.

An alternative procedure would involve delaying any settlement between the member donors until the conclusion of the first stage. This procedure would be more in keeping with the spirit of the Arrangement's implicit objective of isolating the aid process from the imperfections of the balance of payments adjustment process. In order to put this alternative into operation, as was suggested in some of the footnotes in the previous section, the donors would have to agree to make any payments within their borders required as a result of Blue Money procurement prior to final settlement within the Untying Arrangement.[1] Under this type of intra-stage settlement procedure a country with a net creditor position in its Settlement Account would postpone settlement by in effect, temporarily granting credits to the countries who ended up with net debtor positions in their Settlement Accounts. In practice this procedure would aid in the short term balance of payments adjustment process.

How would these net creditor and debtor positions be settled? There are, at least, three major, possible schemes of settlement. The best in terms of the objective of minimizing the balance of payments impact of the aid untying would involve carrying the creditor-debtor positions over into the operation of the second stage in anticipation of their reversal. It might be possible to require that the net debtors put up collateral in the form of titles to aid loans against this eventuality.

---

[1] Under the Extended Plan, LDCs earning Blue Money would merely acquire additional Blue Money deposits.

Second, negative balance of payments targets within the scheme could be set in the second stage for countries who were net creditors in their first stage and positive targets for the net debtors. This alternative would go further toward assuring that the actual settlement would eventually take place. Thus, *ceteris paribus*, the first stage net debtors would untie less in the second stage and the net creditors more, but over the two stages the creditor-debtor positions would balance out. It might be possible for the debtors to pay a small interest premium on their net debtor position to the administering agency of the Arrangement during the second stage which would be turned over to the net creditors. This procedure, however, would be a bad idea as it would encourage countries during the first stage to distribute what *de jure* was untied aid in a *de facto* tied manner, *e.g.*, disproportionately to countries with whom they had particularly close trade ties.

A third scheme would involve the direct settlement by a transfer of reserves from the net debtors to the net creditors. This settlement merely postpones until the end of the stage the intra-stage settlement mentioned initially. Obviously, any of these schemes could be adopted in combination according to specified rules agreed upon in advance.

The operation of the Untying Arrangement in the second stage would be closely related not only to the manner in which the settlement of the first stage was accomplished, but also to the actual results of that stage of operations.[1] To the extent that the results of the first stage differ markedly from the expected outcome of zero net creditor or

---

[1]It is possible that the period of operation for the second stage could be shortened to one year.

debtor positions in the countries' Settlement Accounts, the expenditure shares employed in setting up the second stage of operation would have to be altered. It is reasonable to expect that the expenditure shares employed in deciding on new MAQs for the second stage would be based not only on those implicit in the results of the first stage but also in large part on the behavior of the members' shares in trade carried on during the first stage outside of the operation of the Untying Arrangement. This is true for the reason given in the following paragraph.

The above observation raises implicitly the delicate point of "additionality." Lack of "additionality" occurs when the recipient countries substitute aid financed exports for normal commercial exports. To the extent that a member country's share inside the operation of the Agreement exceeds its share over the same period outside the Agreement, there may be reason to believe that such a substitution has occurred between Blue Money expenditures and expenditures by the LDCs out of earnings through regular trade or aid flows. Where there is strong evidence of such substitution, it may be improper or impossible to use for the second stage the internal share results of the first stage.

In more elaborate proposals for full-scale Development Assistance Payments Unions it has been proposed that the recipients should use Blue Money or aid money in proportion to their share of total exchange earnings.[1] Given the more limited scope of the proposed scheme and the

---

[1]Vinod C. Shah, "Development Assistance Payments Union," Economia Internationale, XXI: 2, 1968, pp. 244-57.

bookkeeping checks already built into it, such a provision seems inappropriate. This observation is particularly germane since any explicit attempt at assuring additionality within the operation of the scheme might well destroy the effectiveness of the entire Untying Arrangement.

4. Withdrawal

After one or more "stages" of the Untying Arrangement, a participating donor or recipient country may choose to withdraw. A recipient country could be allowed to withdraw as long as it agreed to abide by the rules governing the expenditure of its remaining Blue Money aid or to return the unused portion of its claim to the original donor.

A donor country might want to withdraw from the Arrangement because it felt there had been too much substitution between its Blue Money exports and its regular,commercial or aid financed exports. It might be wise, however, to insist that the withdrawing member remain in the Arrangement for one more stage to ease the problem of settlement. If a withdrawing donor country were in fact a net creditor within the Arrangement and settlement had not already taken place, then its net creditor position would have to be paid off either by the prevailing net debtors or by all the remaining donor members as a group. For this purpose, it might be necessary to specify in advance callable subscriptions to a settlement fund based not only on the size of each donor's cummulative MAQ, but also on aggregate aid giving activity. If the withdrawing country were a net debtor at the time of withdrawal, it would have to make good its present net debtor position in terms of convertible currency and agree to cover any subsequent debts incurred as its final

MAQ was committed and spent. It would at no time be necessary for any member donor to be liable for more than its unused MAQ.

D. Membership in the Untying Arrangement

The obverse of the withdrawal question is the issue of the initial membership in the Untying Arrangement. There is no reason why any country who normally receives aid should not be allowed to participate as long as it is willing to sign the membership agreement and abide by its expenditure rules. On the donor side the issue is more complex since the amount of a donor's eligible aid in conjunction with its aid share relative to its projected expenditure share can act to restrict the total amount of aid which could be untied under the Agreement, i.e., reduce the size of all other members' MAQs.

For example, reducing the membership from ten to nine by dropping Belgium under Assumption 1 of the basic estimates, increases the maximum amount of aid which could be untied by almost 75 percent from $864.5 million to $1,510.9 million.[1] This increase in the amount of aid which could be untied as the membership in the Arrangement is reduced from ten to nine is due to two facts. First, with ten donor "members," Belgium is the binding country as a result of its large trade share relative to its aid share. (See Table 2.) Second, the loss of the Belgian MAQ is small relative to the gain in the remaining countries' MAQs. Dropping Japan which is the next binding country in these estimates

[1] These estimates are based on 1966-67 data on eligible aid and adjusted average export shares.

would, however, reduce the total amount of aid which could be untied to \$1,254.8 million. The remaining members could not make up the loss in Japanese untied aid as France quickly becomes binding.[1] As long as a donor country's aid share is large relative to its trade share, there is no gain, in fact there is a loss, to excluding donor countries merely on the grounds that the absolute level of their eligible aid is small.

While a restriction in membership may within limits increase the total dollar amount of aid which could be untied under the Arrangement, this fact does not guarantee that the benefits to the recipient less developed countries will increase proportionately due to the restriction. This follows because the exclusion of a donor or a major trading nation from the Agreement involves the prohibition of Blue Money procurement from the country. If the excluded country were a low cost supplier of certain products, the real value of the aid untied within the Arrangement would be reduced somewhat. Because the proposed Arrangement does not involve complete untying of Blue Money aid, any reduction in the membership in the Arrangement reduces the scope and effect of such untying which does occur.

The impact of exclusion on the trade and balance of payments position of the excluded donor or other non-member is harder to predict. To the extent that the aid recipient countries earn unrestricted foreign exchange, they may substitute trade with the excluded donors outside of

---

[1] With nine donor members, Japan can untie a maximum 100 percent of its eligible aid, while France can untie 96 percent.

their Blue Money and bilateral tied aid procurement. Given the overall foreign exchange constraint faced by the recipients and the imperfections in the procurement process, it is likely, however, that the trade of the excluded countries with the recipients will suffer to some extent as a result of their exclusion. This conclusion should serve to emphasize the fact that an Untying Arrangement such as the one proposed is only a partial and imperfect substitute for an improvement in the international adjustment mechanism or the provision of ample international liquidity.

The above discussion suggests that for a given membership of donor countries in the Agreement and assuming the maximum level of permitted untying is taking place, there will be pressure on the binding country to increase its aid share. A ten percent increase in the contribution of the binding country to its MAQ will permit a corresponding ten percent increase in the MAQs of all the other donors. Conversely, if a participating country is not in a binding position and it wants to increase its aid giving, it must do so on a tied or untied basis outside of the Agreement as presently outlined. The following section discusses, however, such an expansion of the Arrangement.

III. Multilateral Aid Untying with Non-Zero Balance of Payments Effect

It would be possible to expand the framework of the Untying Arrangement outlined in Section II to cover its operation under conditions where the expected direct balance of payments effect of the untying was not zero. In particular a country in balance of payments surplus might be permitted to increase its MAQ above the level indicated by the untying exercise under the strict balance of payments constraint.

An additional Blue Money deposit by a surplus donor would, ceteris paribus, lead to a net debtor position in its Settlement Account for the supra-quota donor and corresponding net credit positions for the other members. Alternatively the additional Blue Money deposit would permit the other participating donors to untie a larger portion of their eligible aid, unless they were already at the 100 percent untied level, while still imposing the constraint of a zero balance of payments impact for these donors. In this latter situation the loss to the supra-quota untier would be less than in the case without the further untying by other donors, and the offset to its debtor position within the Arrangement would accrue to those participating donors who had already untied or were allowed to untie all of their eligible aid.

It would have to be agreed that any donor who while in surplus increased its quota which led to a subsequent debtor position in its settlement account would be entitled to reduce its MAQ appropriately in a later stage.

There are three advantages of these provisions for supra-quota contributions by a surplus donor country. First, the country increasing its quota would be able, through the accounting procedures of the Untying Arrangement, to keep track of the direct consequences of its action. Second, it would build up a debtor position in its Settlement Account which it could later draw down within the context of the Untying Arrangement if it experienced subsequent balance of payments difficulties. Third, it would facilitate the further untying of aid.

There would have to be special provisions for the settlement of the net creditor positions created through this procedure. In particular, in the case where the credit positions accrued only to the "binding countries," these would have to be isolated in a separate account. There would be no problem of settlement outside the Untying Arrangement as that would be taken care of by the supra-quota donor, by definition. The donor would merely receive credit for its generosity against the event of later difficulties. The country to whom the creditor surplus accrued should, perhaps, be required in subsequent stages to work off this surplus by increasing its quota, especially if it were also in surplus.

A donor country in balance of payments deficit might also be permitted to raise its MAQ to a limited extent with the condition that where the purchases were made in surplus donor countries, these donors agreed to hold their net creditor positions in their Settlement Accounts without demanding immediate repayment in foreign exchange from the debtor, deficit donor. These credits might carry a small interest premium, or they might be secured by the foreign aid loans of the deficit donor. In any case, there would have to be definite provision for their liquidation.

While such a procedure for deficit donors might be favored as a means of promoting further untying, limits would have to be placed on its operation in order to ensure that the Untying Arrangement would not become top-heavy with uncleared Settlement Accounts. Deficit donors should not be permitted with one stage of operation to make supra-quota contributions in excess of a level (say 20 percent of its regular quota) which could reasonably be expected to be liquidated within a five year

period. This restriction is necessary in order that the future of the Untying Arrangement is not put in jeopardy, especially considering the amount of untying which would, according to the estimates presented earlier, be allowed under the normal operation of the Agreement.

The expansion of the Agreement to cover supra-quota contributions by surplus donors, nevertheless, is attractive as it would, in fact, permit further untying by both surplus and deficit donors without interference in the aid policies of these donors. It would, moreover, allow the national policy makers to hedge against the day when they might be faced with balance of payments difficulties. The scheme for surplus donors involves the creation of an escape clause which could only be activated under conditions where escape was actually necessary.

IV. Conclusion

The objective of this paper has been to outline a feasible multilateral arrangement for untying the aid of the major donor countries while ensuring that the direct balance of payments effects of such untying are zero or of predictable non-zero magnitude. Such an Untying Arrangement has been outlined in Sections II.C and III.

Under the Arrangement, as outlined in Section II.C, the participating donor countries would agree to untie their aid up to an amount equal to their share in the expected expenditure of such aid by the participant recipient countries. No country could untie more than 100 percent of its present or projected tied aid. The participant recipient countries would agree to spend such aid only in the participant donor countries. Under an attractive alternative (the Extended Plan), the

recipient countries would be permitted also to spend the untied aid in other participating recipient countries eventually producing, by the estimates presented, about \$.15 in increased inter-recipient trade per dollar of aid untied. This alternative, however, would involve much more uncertainty about the eventual impact on the trade of the participant donors.

Under the Untying Arrangement of Section II.C, the participant donors would retain political control over the expenditure of their aid as they do now with their bilateral aid. The accounting and clearing of the aid flows denominated in "Blue Money" units and facilitated through Multilateral Aid Quotas would be done by a central agency. There would need to be no balance of payments effect of the scheme until it was necessary to make final settlement and at that time there would be an impact only insofar as the actual expenditure pattern of the untied aid differed from the expected pattern. All the settlement procedures presented are relatively simple. Moreover, any imbalances which were revealed in one stage of operation of the Arrangement could be reversed in a subsequent stage or stages.

The empirical estimates presented in Section II.B suggest that the simple Untying Arrangement proposed could be a powerful procedure for untying aid. A maximum of 25 to 30 percent of the presently tied aid of the ten major DAC donors could be untied, amounting to between \$850 and \$1,050 million in aid per year. Reducing the donor membership to nine members would increase this amount to at least \$1.5 billion per year. Allowing spending in participating recipient countries would

generate more than $150 million in inter-recipient trade per year.

The more ambitious proposal outlined in Section III would permit donors to untie more of their aid with predictable, non-zero balance of payments effects. Surplus country donors running a Settlement Account deficit due to supra-quota untying would be able to reverse their positions in the event of subsequent balance of payments difficulties. Deficit country donors making supra-quota untying efforts could be provided with temporary credits within the framework of the Arrangement. The settlement provisions under this proposal would, of course, have to be somewhat more complicated.

As outlined in this paper, the multilateral Untying Arrangement should prove attractive to the major aid donors who are caught between a desire to efficiently promote the development of aid receiving countries and a need in an imperfect world to restrain their generosity because of present or anticipated balance of payments difficulties. Moreover, the proposal would permit an increase in the real value of a given dollar value of aid and, thus, raise the effectiveness of aid in promoting the real growth of the less developed countries.

The cooperative nature of the proposal could produce several attractive by-products. It should halt somewhat the self-defeating tendency toward competitive tying and the increasing, asymetrical bilateralization of trade between the developed and the less developed countries of the world. It should facilitate through the supervising agency, efforts directed toward further coordination of aid policies. Finally, the central agency could be useful to the recipient countries in giving and exchanging advice on procurement policies.

Appendix

A. The Analytical Solution of the Multilateral Untying Problem

In order for there to be a zero direct balance of payments impact on each country i from untying, the following condition must hold:

$$(1) \quad A_i x_i - S_i \sum_{j=1}^{n} A_j x_j = 0 \quad \text{for countries } i = 1, \ldots, n$$

where A_i is the aid eligible to be untied,

x_i is the percent of previously tied aid which actually becomes untied,

S_i is country i's share in the marginal expenditures of the untied aid by the recipient counties treated as a unit ($\sum_{i=1}^{n} S_i = 1$), and

n is the number of participating donor countries.

Expression (1) can be rewritten as:

$$(2) \quad (1 - S_i)A_i x_i - S_i \sum_{j \neq i} A_j x_j = 0 \text{ for } i = 1, \ldots, n.$$

In the matrix form

$$(3) \quad [I - S] \quad Ax = 0$$

where I is the (n x n) identity matrix,

S is an (n x n) square matric (all elements of each row are S_i),

A is an (n x n) diagonal matric (each element of the principal diagonal is the aid of country i eligible to be untied, and

x is a vector of percentages of aid which can be untied (the unknowns in the problem).

As written, expression (3) is a system of n homogeneous equations, but as long as $\sum_{i=1}^{n} S_i = 1$, the rank of [I - S] is n - 1, hence the solution

of (3) for the vector x is unique up to a scalar multiple.[1] But there is another condition on the x vector:

(4) $x_i \leq 1$ for $i = 1, . . . , n.$[2]

Thus, we can normalize on one of the x_i's and solve the remaining $x - 1$ equations uniquely in terms of this normalization.

For example, if we normalize on x_n, we are left with:

(5) $[I - S^*] A^* x^* = B^*$

where S^* is the $(n - 1)$ by $(n - 1)$ square matrix formed by deleting the last row and column of S,

A^* is a diagonal matrix formed by deleting the nth row and column of A,

x^* is formed by deleting the nth element of x,

B^* is an $(n - 1)$ element vector with elements $S_i A_n$.

The solution to the system of non-homogeneous equations (5) is:

(6) $A^* x^* = [I - S]^{-1} B^*$ in terms of the amounts of aid untied for countires $i = 1, . . . , n - 1,$

and $A_n x_n = A_n$ for country n.

This is the solution to the untying problem as long as condition (4) is satisfied. In terms of the percentages of eligible aid which can be untied, the solution is:

(7) $x^* = A^{*-1} [I - S^*]^{-1} B^*$ for $i = 1, . . . , n - 1$ and

$x_n = 1.$

---

1. This restriction that the sum of the expenditure shares is one which is necessary in order to assure that the rank of [I-S] is n-1 means the same in symbols as the verbal restriction contained in the Untying Arrangement that the recipients are permitted to spend the untied aid only in the participating donor countries. The Extended Plan will be considered in Appendix Section C.

2. In other words this means no country can untie more than 100 percent of its tied aid.

As was indicated in the text, solution (6) corresponds to untying aid in proportion to the country's expenditure share. Once one participating country has untied all of its aid, the process must stop unless this country is willing to increase its aid. The "binding" or constraining country in the process is going to be that one whose trade share is largest relative to its aid share.

B. Application of the Solution Process

In order to apply the analysis above to the real world, several simplifying assumptions are necessary.

It must be assumed that either:

I(a): each donor distributes his tied aid in the same proportions across recipients (that is, each recipient country receives the same proportion of each donor country's tied aid);

or I (b): each donor unties his tied aid to each recipient in the same proportion;

and II : A donor's share in the expenditures of each recipient is the same across recipients.

I(b) can be imposed by the untying arrangements but II clearly is not satisfied in the real world. Hence, the solution to the problem is merely an approximation. Given this complication, an alternative to the Basic Plan proposed in the text would be for the exercise to be carried out for each recipient country or groups of countries (Restricted Plan). This solution, however, would be much more complicated to administer, although the range of error in operation would, perhaps, be reduced. While this alternative might be particularly appropriate or even desirable in cases of recipient countries or groups of countries for which consortia or consultative groups are already in existence, structuring a general untying scheme on this basis might be objected to by some donors as unduely constraining their aid policies.

A final problem in the application of any of the schemes outlined in the text is our lack of information concerning the marginal shares of the participant donors in the expenditures of the recipients. The estimates given in the text used average trade shares and, of course, overstate (understate) the gains to a donor country from untying to the extent that its marginal share exceeds (is less than) its average share. While this problem poses complications for the initial, smooth implimentation of the scheme, subsequent adjustments can be made based on the initial experience. (See Appendix Section D.)

C. Computation of the Expenditure Shares under the Extended Plan

Under the Extended Plan where the recipient countries are permitted to spend the untied aid in other participating, recipient countries, the computation of the appropriate expenditure shares (S_i) for the donors involves an intermediate stage. Under the restriction that the recipients eventually must spend all of their receipts received directly or indirectly under the Untying Arrangement, all of the initially untied aid will eventually return to the donors in the form of export earnings.[1] The question is what will be the final distribution among donors of these export receipts?

To solve this problem, consider m countries of which k are donors and $(m - k)$ are recipients.[2] Construct the matrix

$$(8) \quad Z \equiv [I - M]$$

1. It is assumed again, as has been the case throughout the analysis, that the donors act as "sinks," absorbing all exchange earnings under the program, i.e., there are no induced imports by the donors.

2. In the example used in the text, $m = 19$, $k = 10$, and $m - k = 9$.

where I is the (m x m) identity matrix, and

M is a matrix of import shares.

The matrix M has all zeros in the first k columns and the elements in each of the remaining $(m - k)$ columns (one for each recipient) are the import shares of each of the m countries in the jth recipient country.[1]

The inverse of Z $(=[I-M]^{-1})$ yields the final spending pattern of the $(k-m)$ recipients. The sum of the first k elements of each column $j (j \geq m - k)$ is one. Each element shows how each recipient country will eventually distribute the expenditures resulting from an additional dollar of untied aid, taking into account the induced export earnings due to its expenditures in the other $(m - k - 1)$ recipients. (The sum of the last $(m - k)$ elements of each column j $(j \geq m-k)$ is the amount of imports from the recipient countries generated per dollar of increased untied aid to country j.)

For the calculations of the donor expenditures shares $(\hat{S}_i)$ used in the text, the z^*_{ij} elements of the inverse of Z were weighted by country or area j's 1963-66 average share in "Total Official [Aid] Flows (Net)." That is:

$$(9) \quad \hat{S}_i = \sum_{j=k+1}^{m} z^*_{ij} \; w_j \quad \text{for } i = 1, \ldots, k$$

where $\hat{S}_i$ is the estimated final donor expenditure share,

W_j is a column vector of aid shares as described above, and

$^*_{ij}$ is a row of the inverse of $Z(=[I-M]^{-1})$

Again, the following condition holds:

$$(10) \quad \sum_{i=1}^{k} \hat{S}_i = 1.$$

---

[1] Again these should be marginal import shares although average shares were used in the actual calculations.

D. Target Adjustment for Settlement Account Imbalances

Any discrepancies between expected and actual operation of the scheme in its initial phases can be easily adjusted for in the subsequent operation of the Untying Arrangement. If a donor country in the initial operation period unties its aid disproportionately for recipient countries where the donor's expenditure share is higher than average and, thus, the donor produces a net creditor position in its Settlement Account, the donor would have to untie that much more in subsequent periods.

To take care of such net creditor or debtor positions in subsequent stages of the Agreement, the right hand side of equation (3) Part A, would be redefined as the vector G where

$$(11) \quad \sum_{i=1}^{n} G_i = 0.$$

As defined, G_i would equal the loss to country i in the previous stage of the Arrangement. Thus the right hand side of (5) would become

$$(12) \quad \hat{B}^* = B^* + G^*$$

and the solution follows although the estimates used for S and S^* may change between stages.