

Weapon Exports and Aid to Developing Countries

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1. The Traditional View

Weapon exports are considered to be immoral by many people concerned with peace who believe: (1) Armaments have a tendency to lead to war. (2) Especially the poor (underdeveloped) countries should use their very limited capacities to acquire civilian goods to increase the standard of living of their population, and not "waste" them for weapons.

It is concluded that the aid to developing countries should either be in the form of civilian goods or in money. This holds particularly for caritative organizations, e.g. the Red Cross, which would without doubt create a scandal if they "aided" these countries by shipping weapons. Similar reasoning stands behind international sanctions which sometimes only prohibit trade in weapons but do not apply to other goods such as food and medical equipment going directly to the population (for a general account see Galtung 1967). The problem of weapon exports is widely discussed in politics, e.g. the Swiss population voted as recently as 1972 in a referendum which asked the question whether a neutral country should export arms.

2. The Aim of This Study

This study analyzes the effects of various forms of aid on the developing countries' effective purchases of civilian goods and armaments. Can the donor countries influence the way the recipient countries use the aid? If so, what is the most effective form of transfers and are there conflicts with other goals; such as the developing countries' sovereignty?

A simple abstract model is used to concentrate on the central problem posed. It originates from the modern theory of public finance (e.g., Pauly 1970, West 1971, Aaron and von Furstenberg 1971); it thus belongs to what may be called the "economic approach to peace research" (see, e.g.,

Boulding 1962, 1967 and contributions by such noted economists as Isard, Klein and Leontief; for Europe see Rothschild 1970 and Frey 1974). Shortly after the present paper had been submitted and accepted, the author was made aware by the editors that Thomas Schelling (1958, ch. 28, 438-456) provided an imaginative verbal analysis of similar problems and came to essentially the same conclusions.

The results are rather surprising and counterintuitive in that they contradict the "traditional" view. It is much more difficult than usually thought to give aid without leading to increased armaments. The theoretical deduction is supported by case studies, suggesting that the basic assumptions of the model are quite realistic. It does not necessarily follow, though, that weapon exports to developing countries should be tolerated. Rather the results indicate that much more thought should be given to the form in which these countries are supported. Some proposals derived from the abstract model point toward sensible practical policies.

3. Aid in Goods and Aid in Money

Transfers of civilian goods

The goal of donor countries *should be* to help the poor countries to increase their standard of living but *not* for them to have more weapons. If two commodities only are considered, namely weapons (W) and other (civilian) goods (G) the rich countries' aim thus is assumed to increase G by a certain amount while leaving W unchanged. This aim is, of course, normative rather than descriptive.

The developing countries (DC), of which one is taken as representative for the whole, are confronted with an effective economic limit given by the foreign exchange constraint. In Figure 1 AA' indicates the budget constraint imposed by foreign exchange. The developing country considered may from abroad *either* buy OA' of Good G or OA of W or any combination of them along AA' . The slope of AA' is given by the relative prices in foreign exchange units between weapons and other goods (p_W/p_G). The DC values both weapons and other goods. It is not the purpose of this paper to explain *why* these countries (as well as the rich countries) want to be armed; for the realism of the model it is sufficient to point out that almost all of them (unfortunately) devote a quite sizable fraction of their foreign exchange income for that purpose. The utility function measuring the value of each combination of G and W may be either that of the community as a whole (for the difficulties connected with that concept see Samuelson 1956) or of the ruling elite. The indifference line U_0 shows those combinations (G, W) which leave the developing country at the same utility level. The quantities chosen will be (G_0, W_0) where the highest utility level attainable is reached (point P_0).

Assume that the donor countries transfer civilian goods in the quantity $G_0 G_1$ to the developing country. The point reached (P_1) will not be optimal for the DC : by moving along the new budget line BB' it can reach the

optimal point P_2 on a higher indifference curve (U_2). This movement, entailing a decrease in civilian goods and an increase in weapons can be brought about in two different ways: (1) The developing nation can sell part of the goods given by the donor countries (G_1G_2) on the international market and with the money received purchase weapons of the amount W_0W_2 . This possibility is excluded in the following, as the donor countries will certainly oppose such a policy, or there might not be an appropriate market. (2) The developing country will decrease by G_1G_2 the quantity of G -commodities previously bought, and with the money saved it will purchase additional weapons of the amount W_0W_2 . This strategy is more subtle than (1). The donor countries have less possibility

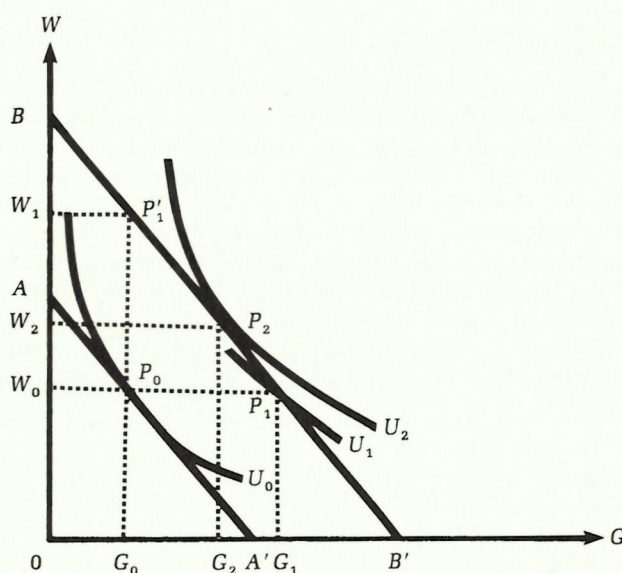


FIGURE 1.

to oppose a transaction which would certainly be labeled an "internal affair" of the DC.

Conversely, if weapons are given in the quantity W_0W_1 , the recipient country will substitute weapons for civilian goods to arrive at its optimal situation P_2 . In any case, part of the aid given in civilian goods is "wasted" in the sense that the increase of foreign exchange income involved is partly used for the purchase of weapons. The fact that the gift is "tied" has no effect.

Transfers of money

Figure 1 moreover shows that an untied foreign exchange transfer in money of $A'B'$ (measured in units of G) or of AB (measured in units

of W) leads to exactly the same outcome as before, namely point P_2 with bundle (G_2, W_2) .

Summary of the Results

Regardless of what form foreign aid takes, the recipient country can always substitute military for civilian goods (or vice versa) to reach the point it deems optimal. Foreign aid in kind or in money has no influence upon what goods are purchased and used by developing countries.

4. Aid by Price Reductions

The effects on the goods purchased

Sometimes aid to developing countries is given by charging lower prices and/or offering favorable credit conditions for the purchase of certain goods. In Figure 2, the budget line swings about point A to the right (AC'), indicating that the price of civilian goods is decreased relative to weapons prices. The developing countries will, under the new conditions, choose P_3 , (G_3, W_3) . The price reduction was (by assumption) chosen to be of equal magnitude as the transfer of goods or money in the last section. (I.e., P_3 , the tangency between U_3 and AC' lies on the budget constraint BB' . A transfer of foreign exchange in the form of money would have shifted the budget to BB' going through point P_3 .) It can easily be seen that the price reduction on the civilian good leads to an increased consump-

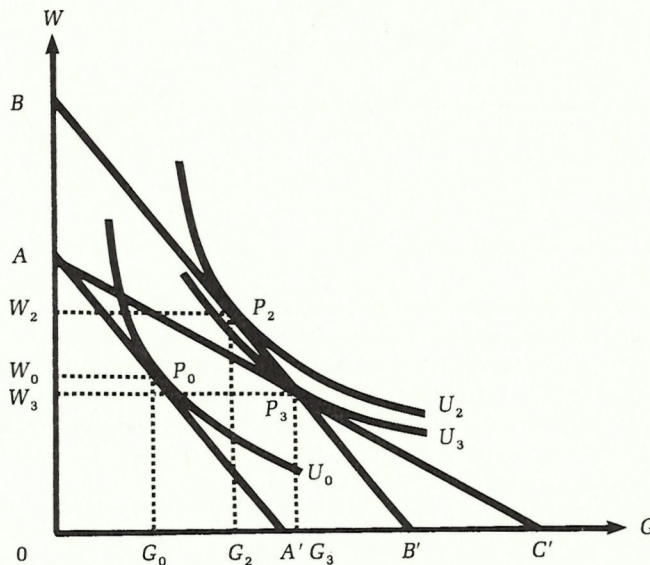


FIGURE 2.

tion of that good compared to transfers in kind or money by the amount G_2G_3 , and to a reduced purchase of weapons by the amount W_2W_3 . At the same cost to the donor nation, the developing country will generate a larger increase in civilian goods with price reductions and therefore fulfills better one of the aims followed by the donor countries.

The effects on the developing country's utility

The favorable effects of price reductions on the structure of goods consumed is, unfortunately, accompanied by the disadvantage that price subsidies are inefficient. The same increase in utility for the DC can be

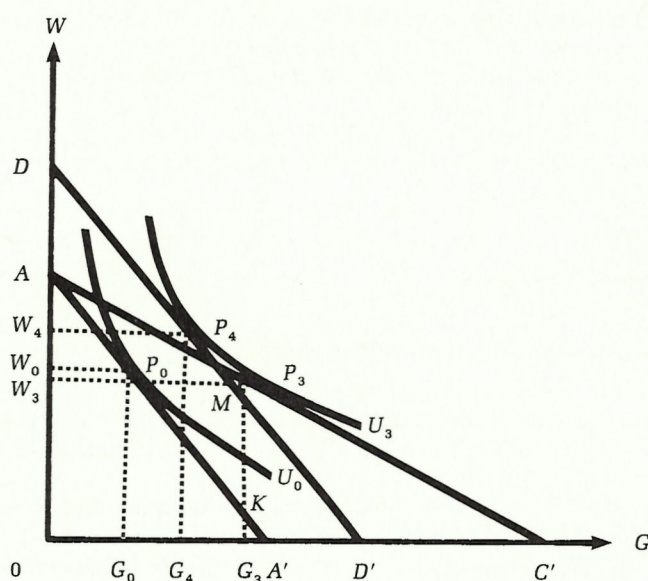


FIGURE 3.

achieved by a smaller amount of aid if it is given in kind or in money than in price reductions. As shown in Figure 3, the utility level U_3 can be achieved either by a price subsidy leading to budget line AC' and optimal point P_3 , or by a transfer in money or kind leading to budget line DD' and optimal point P_4 . At quantity G_3 one needs MK units of aid if given in money or kind, but P_3K units if given through price reductions to reach utility level U_3 .

The size of this inefficiency depends on the price and income elasticities of demand and can, in principle, be measured. If, e.g., the income elasticity is unity, the price elasticity -0.75 (implying an elasticity of substitution of the utility function of unity) and the price reduction is 50%, 24.3%

less aid would be needed if the gift were made in money or kind, or conversely, available foreign exchange income of the developing country would increase by 18.9% if given in the form of goods or money (see Aaron and von Furstenberg 1971, Table 1).

The donor's and recipient's utility: the basic dilemma

It should be noted that this inefficiency occurs with respect to the recipient country only. It may well be that the donor countries prefer price reductions because they lead to a decrease in the "consumption" of weapons and an increase in civilian goods. The utility gain of the rich countries cannot, however, be usefully compared to the utility loss of the developing countries.

This points to a basic conflict of goals as there is in any case some "waste" involved: If aid is given to maximally increase the poor country's utility a part of the civilian goods and money transferred will be "wasted" for the purchase of weapons. If aid is given such as to maximize the purchase and consumption of civilian goods, part of the aid is "wasted" in the sense that the DC's utility could have been increased more by a different form of transfer.

5. Possible Solutions

Transfer of goods with restricted substitutability

Aid to a developing country can be composed of goods which (1) were consumed in small quantities in the developing countries; and/or (2) are given in quantities so large that only a small part of the aid can be substituted.

Consider Figure 4 whose abscissa represents the quantities of a particular civilian good G^i . DC reaches its optimal point P_0 with the commodity bundle (G_0^i, W_0) . Assume that the quantity $G_0^i G_1^i$ is transferred such that P_1 is reached. The developing country would like to attain P_2 , the utility maximum on budget line FF' . This is, however, not possible as the purchase of G^i by DC can only be reduced to zero, but not below. (Remember also that—by assumption—the G -commodities cannot be sold on an international market.) All the developing country can do is to reduce purchases of the civilian good from G_0^i to 0 and use the foreign exchange savings to buy additional arms in the amount $W_0 A$. The "waste" is reduced by $G_2^i G_2^{i'}$. The "waste" reduction is greater the less of the civilian good was initially consumed and the more of it is transferred.

In practice, it is difficult to apply this policy as there are usually substitutes to the G^i -commodity concerned whose purchase can be reduced if the foreign exchange outlays for G^i have fallen to zero. Even if this problem did not exist and a good is transferred which is not purchased at all, it is doubtful whether this good adds much to the welfare of the poor country.

All-or-None Scheme

Another way of aiding the *DC* while affording little opportunity to substitute weapons is to confront the recipient country with an "all-or-nothing" offer such as P_5 in Figure 4. At that point more of good G^i is consumed than otherwise yet the recipient country accepts this offer because it leads to a (small) increase of utility (from U_0 to U'_0). The donor country makes

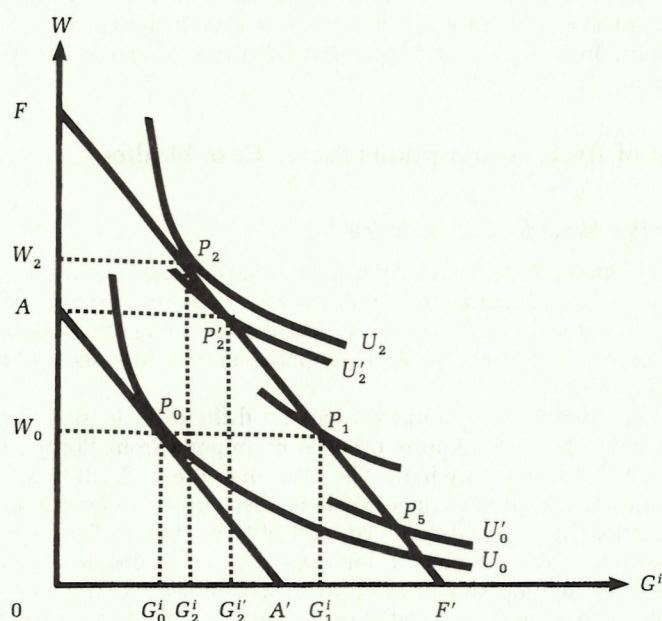


FIGURE 4.

it clear that it stops aid immediately if the *DC* substitutes along its budget line FF' . This implies, of course, a certain interference with the internal affairs, making the conflict of goals again apparent.

6. Possible Criticisms of the Model

The analysis developed and the particular model used may be criticized on various grounds such as its high level of abstraction. It should be kept in mind that it is the purpose of this paper to highlight only one, but an important, aspect of armaments of poor countries and the aid by the rich nations. There are many other aspects of their interrelationship which were not touched upon here.

Two possible and worthwhile points of criticism may be mentioned here: (1) The utility function (indifference) curves of the *DC* between weapons and civilian goods was taken to be given, i.e. the development

aid does not induce any relevant shifts. This seems *a priori* realistic within a given political system because behind these preferences there are rather basic interests of a country. (2) The analysis assumes that movements along a budget line are costless. This is not true in reality, but seems a useful approximation. No change of internal production is needed but only a different use of foreign exchange earnings which is much easier to do, especially with well developed international markets.

The realism of these two assumptions can be empirically analyzed. A rigorous test would, however, require large scale historical and econometric studies. In the present paper only sketches of particular cases are presented.

7. Test of Basic Assumptions: Some Case Studies¹

U. S. policy towards Latin America

The Kennedy and Johnson Administrations intended to force developing countries in Latin America to spend less resources for armament and more for civilian purposes by reducing exports of arms (except for counter-insurgency weapons). This was the declared policy of the "Alliance for Progress" initiated in 1961.

The Latin American countries had no difficulties in substituting for the reduced U.S. arms imports other arms imports from Europe (France, U.K. West Germany, Sweden). The fact that the U.S. did not supply supersonic jets and aircraft carriers had no effect on the preference functions of Peru, Brazil and Argentina (or at least of their rulers'). They demanded and received these weapons from other countries despite formal U.S. protests. (See Stanley and Pearton 1972, 210 *et seq.*; Kemp 1966, 386 *et seq.*; 1967, 375 *et seq.*) The statistics presented by the Stockholm International Peace Research Institute (SIPRI 1971, 863 *et seq.*) also show that the *total* arms imports of Latin American countries did not show any significant changes over this period.

Other cases studies

The other cases analyzed by Stanley and Pearton (1972, 165 *et seq.*) referring to Portugal's African Territories, to South Africa and Rhodesia, to Nigeria and to Israel and the Arab countries lead to the same conclusion, namely that restrictions of arms exports have little effect on the recipient nation. This conclusion seems to be valid under a great many different circumstances, i.e. it is quite independent of size and kind of arms boycotts, political goals and extent of international consensus.

The example of South Africa indicates that even a practically unanimous political opposition of all countries is insufficient to prevent the government of the country affected from following its preferences. The international boycott referring to strategically important goods, only, was not followed

¹I am grateful to my assistant Niels Eisenhart Rothe for his research on empirical evidence.

by some weapons exporting countries (U.K., France, Italy), and, more importantly, South Africa increasingly substituted domestic production for armaments imports. The effect is that South Africa today is a weapons exporter!

The example of Portugal illustrates another substitution possibility: regional arms control is ineffective as long as the end use cannot be controlled. Portugal received arms for NATO-purposes but could not be prevented from using them in Africa. Substitution is thus facilitated by the appearance of intermediate weapons suppliers, which seem to have increased in importance in recent years.

Conclusion from cases studies

The examples presented (and others) clearly suggest that the two basic assumptions made in the model are quite realistic (or, at least, that the burden of the proof lies on the opposite side): (1) "National" preferences do not change when one or all arms suppliers decides on a boycott, and (2) Substitution (i.e. movements along the budget line) is available without any major difficulties.

8. Conclusions

The analysis leads to rather surprising results: "Aid" in the form of weapons leads to the same structure of consumption within developing countries as aid in the form of civilian goods or in money (foreign exchange). If the donor countries want the poor countries to use their aid for non-military purposes, a basic dilemma arises: if aid is given in the form of price subsidies, the recipient countries experience a relative loss of utility, if other measures are used (such as an "all-or-none" scheme) there is an interference in the developing countries' internal affairs.

A boycott of weapons exports may under some circumstances even lead to the *paradoxical result* that the countries affected are induced to substitute for these imports their own production of weapons. The "military-industrial complex" is thus exported and the overall level of armament expenditures may well increase.

What to do?

One should be careful not to draw any hasty conclusions from this analysis. One may still oppose armament exports (particularly to developing countries) for purely ethical reasons, without any regard to the missing or even counterproductive effects on total armaments. However, the study suggests that it is worthwhile to look to *other* instruments to reduce armaments, to further peace, and to resolve the basic dilemma which exists.

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Abstract

The goal of the rich countries should be to aid the poor countries to increase their standard of living but not to increase their holdings of weapons. It is shown that a basic dilemma arises. The structure of "consumption" of the recipient countries cannot be influenced by giving aid in the form of (civilian) goods rather than untied foreign exchange. The consumption of civilian goods can be increased by granting a price-subsidy but this leads to a smaller increase in utility than obtained with a transfer in money or kind. Transfers of goods with restricted substitutability and "all-or-none" schemes are suggested to overcome these conflicts, but they imply an interference with the internal affairs of the poor countries.