An Economic Theory of Mutually Advantageous Issue Linkages in International Negotiations

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Robert D. Tollison and Thomas D. Willett

Introduction

There has been considerable interest in recent years on both a practical and a scholarly level in the question of issue linkages in international negotiations. While interest in linkage is not new in international affairs, what seems different is the explicit stress put on linkages as a negotiating device, that is, making trade-offs explicit among issues. Most of the highly publicized cases of proposed issue linkages appear to have been motivated by attempts of individual countries or groups of countries to extend their dominant bargaining or veto power in one particular issue area into other areas so as to achieve maximum advantage from their whole array of international interactions, for example, the possible threat of U.S. troop withdrawals as a way to influence German international financial policies, and the attempts by OPEC to link oil discussions to other international economic issues.[1] Indeed, as a referee of this paper pointed out, the general, albeit uninformed, view has been that linkages usually exacerbate problems rather than help to resolve them.

In this paper we stress the existence of an additional rationale for linkage

that relies upon mutual interest. Drawing on the economic theory of exchange, we consider the use of issue linkages to facilitate the completion of a greater number of mutually beneficial agreements among nations. Our purpose is not to deny the importance of the traditional rationales for issue linkages, but rather to spell out some of the implications of our mutual benefit rationale. We hope that this will prove a fruitful step toward developing a more general theory of issue linkages which integrates and extends both types of considerations.

Our approach differs from many examples of economic analysis in that we explicitly focus upon distributional considerations. Often in the economics literature attention is focused on attaining maximum aggregate economic efficiency or potential welfare to the neglect of distributional considerations. While for many types of domestic policies this may be a reasonable simplification, for many international issues it clearly is not. Consider, for example, a change in macroeconomic policies which might benefit another country greatly, but which would cause moderate harm to the country initiating the policy change. Even though to most observers the gain to the one country seems much greater than the loss to the other, the harmed country has no direct interest in adopting the policy which would maximize potential welfare between the two countries. The economist's answer to this dilemma is that the country which would have a large prospective gain should bribe the country which would be harmed with sufficient compensation so that it too would enjoy an overall gain. In practice, however, the economist's direct bribe is extremely unlikely to be politically feasible. Through the formal or informal linking of issues, however, the possibility emerges of indirectly paying compensation through positions taken in other negotiations.

Although well understood by many negotiators, the use of issue linkages to secure international agreements, which would otherwise be frustrated because of distributional effects, does not appear to have been emphasized. In a recent paper William Wallace has discussed many facets of issue linkages and outlined a major project that Chatham House is undertaking that will examine how major Atlantic countries attempt to link different issue areas in their foreign relations.[2] Wallace outlines some of the pertinent factors such as the level of government-to-government contact, the capacity of top political leaders to absorb information on issues, and a number of other institutional considerations that in his view influence the process of issue linkage among governments. He does not, however, consider issue linkages as a method of overcoming distributional obstacles to the provision of international cooperative actions, nor to our knowledge has this been emphasized elsewhere in discussions of international issue linkages other than in our own preliminary sketch of the beginnings of a theory of optimal negotiations.[3]

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[2] William Wallace, "Issues Linkage Among Atlantic Governments," *International Affairs* (April 1976): 163–179.

[3] See the section on "Towards a Theory of Optimal Negotiations," in Robert D. Tollison and Thomas D. Willett, "Institutional Mechanisms for Dealing with International Externalities: A

A major conclusion of our analysis is that linkage will be more important where the distribution of benefits from agreement is highly skewed toward one (or a few) countries. In this case linkage of issues with offsetting distributional patterns can help promote agreements which otherwise might go unconsumated because of distributional effects. The converse of this proposition is also interesting in that linkage will not be important where the distribution of benefits from agreement is fairly even across countries. Some additional qualifications and extensions of the analysis will be discussed.

## The mutual advantage approach to issue linkages

Our purpose in this section is to introduce the reader to some of the concepts and terminology that will be employed in the subsequent analysis. This discussion, as well as the later analysis, will be presented in terms of single-actor models and will assume that negotiators are efficient representatives of their countries' interests. We are aware that this approach has certain limitations, but we will defer consideration of these complications and qualifications. For the present we take the view that the analysis of policies on the basis of single-actor models of economic self-interest can offer useful insights if applied with due respect for the complexities of particular situations.

Consider a simple case of bargaining between two representative individuals in Figure 1. There are two individuals and two commodities. To give the model a flavor of international negotiations, one might think of the two individuals as diplomats-negotiators and the two commodities as issues on which the diplomats seek to reach an agreement. For example, the two issues could be expenditures to support a common defense alliance versus expenditures for a foreign aid program which the two countries jointly provide for a third country. The model assumes by construction that there is a fixed amount of expenditures to support the two issues over which agreements can be negotiated. Thus, $AD = CB$ represents the level of expenditure necessary to fund the defense alliance, and $AC = DB$ is the expenditure level required, say, to fund a capital development project under the joint foreign aid program. One might think of these magnitudes as allocations for such potential joint projects given in the government budget of the country of each negotiator.

The curves denoted by a and b are the indifference curves of the two negotiators. Each point on these curves represents a combination of ex-

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Public Choice Perspective," in *The Law of the Sea: U.S. Interests and Alternatives,* Ryan C. Amacher and Richard J. Sweeney, eds. (Washington, D.C.: American Enterprise Institute, 1976), pp. 97–100. Within the context of fiscal federalism this aspect of issue linkages is stressed in Albert Breton, "Public Goods and the Stability of Federalism," *Kyklos* 23 4 (1970): 882–901. This rationale is also briefly alluded to, but not emphasized, in Keohane and Nye, op. cit., p. 122, where they mention that "reinforcing this [power] impetus toward linkage was the inclination, particularly of Third World majorities at international conferences, to link issues to secure satisfactory overall bargains."

Figure 1: Exchange between negotiators

Consider the figure labels: C, B, f, d, e, a, Y_a, c, b, A, X_a, D, FOREIGN AID, DEFENSE
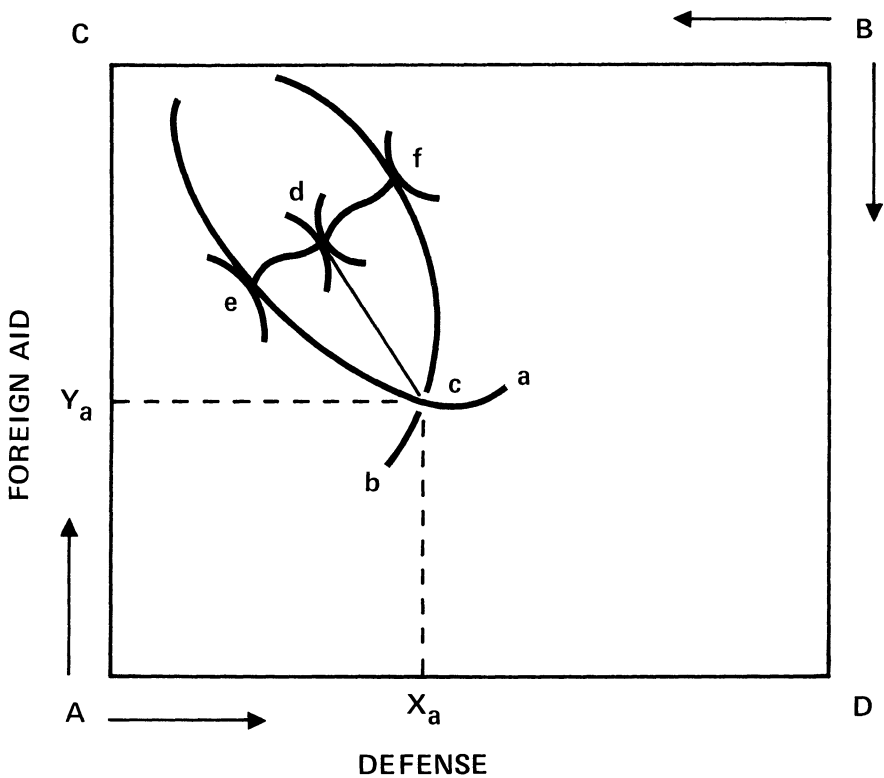
penditures on the two issues that provide negotiator A and negotiator B with the same level of satisfaction as measured by some utility index. A whole family of such curves for each negotiator can be derived, though we only utilize one for each negotiator in the discussion here. It is important to recognize that negotiator A's indifference curves are read from the southwest origin at A and negotiator B's are read from the northeast origin at B. Thus, increases in negotiator A's satisfaction (i.e., higher indifference curves) are represented by northeastward movements, and increases in welfare for negotiator B are read by southwestward movements. A higher indifference curve for a negotiator in this setting simply means a more preferred locus of benefits from the two joint projects.

Consider negotiations between the two diplomats starting at point c in the diagram. Negotiator A, whose position is read from the southwest corner of the box, is originally endowed with AX_a units of contribution to the common foreign aid program. Negotiator B, whose position is read from the northeast

corner of the box, is endowed with the remainder of the fixed amounts of contributions to the two joint activities, that is, with X_aD units of defense expenditures and Y_aC units of foreign aid expenditures. We want to analyze negotiations or agreements emanating from c and simply accept the fact for the moment that the two countries somehow arrived at c—i.e., at what will turn out to be an unsustainable position. The football-shaped area, viewed from point c, represents the potential gains from agreement confronting the negotiators. This follows since movements from c into that area place *both* negotiators on higher indifference curves. The area of potential gains from agreement is bounded by the two indifference curves which intersect at c since neither negotiator would accept a bargain that lowered his original level of satisfaction as given by indifference curves a and b, respectively. Movements into the football-shaped area depend upon the terms of trade or "price" at which the two negotiators might trade off between the two issues, and their immediate problem is to reach agreement on what the terms of trade will be. For example, if negotiator A were a very superior bargainer, he might be able to obtain an agreement to move to f where negotiator B is no better off than in the absence of trade. Negotiator B, of course, could perhaps obtain a point such as e if he were a very superior bargainer. In general, however, bargaining will take place along some intermediate vector such as cd where the gains from agreement between the two issues are split between the two negotiators.

Bargaining will take place until the gains from agreement are exhausted, which occurs at points where the indifference curves of the two negotiators become tangent. Tangencies of the two sets of indifference curves exhaust mutually agreeable trades since this implies that both negotiators place the same subjective trade-off on one issue relative to the other. When all such tangencies within the football-shaped area are connected, such as ef, the result is called a contract curve, because agreements will predictably end up along such a relation where the gains from agreement are exhausted. The exact point on the contract curve at which a given agreement is reached is where the terms of trade line and the two indifference curves are tangent, i.e., the price at which the negotiators can trade is equal to the subjective evaluations that they place on the two issues. In the example in Figure 1, negotiator A trades off increased expenditures on the foreign aid program for reductions in the support of the defense alliance, while B trades off in the opposite direction. The basis for such an agreement could reside in the comparative advantage of country A in providing the capital development project in the foreign aid program versus the comparative advantage of country B in providing the joint defense expenditures, where both countries share common objectives in these areas.

Several other points in this simple example are worth keeping in mind. It should be clear that where one ends up in such an exercise is not independent of where one starts. The original endowments of resources define the limits of mutually agreeable negotiations, and for purposes of this discussion these were

determined somehow outside of the model, e.g., some countries have more resources than others. The influence of such differences on negotiations is not a trivial problem, but we will defer consideration of such problems until the next section.

Movements to the contract curve may be thought of as welfare enhancing for both countries, or as positive-sum or Pareto-superior, in that both parties are made better off by such agreements.

Once on the contract curve, mutually acceptable agreements are no longer possible. Moving along a contract curve means that one negotiator must give up more on *both* issues to the other negotiator. This is an example of zero-sum trade since one party wins what the other gives up. Such agreements represent a situation of pure conflict.

Another category of agreement can be characterized as negative-sum in the sense that individuals would not voluntarily engage in such agreements, that is, the expected value of agreeing ("playing the game") is less than the individual's original endowment which could be retained by not agreeing. Normally, we would not expect negative-sum agreements to be quantitatively important in the two-person case since they are irrational for at least one negotiator. For example, Negotiator A would not voluntarily agree to a movement from c that placed him on a lower indifference curve than a, although, of course, the negotiator could be "coerced" into such a move through threats.

While such threat considerations can be quite important in some negotiations, they lie beyond the scope of our analysis. In our terminology our primary concern will be with the analysis of the factors that affect whether negotiations among countries reach the contract curve, that is, with the factors that promote positive-sum agreements among nations.

A simple model of issue linkages

As a means of exposition, we will consider the case of the production of military hardware in an alliance and illustrate how different cost functions can make agreements easier or more difficult to achieve where countries perceive an interest in having production located in their own country.[4] In Figure 2.1–2.4 let $Q_A Q_B$ equal the total amount of alliance hardware to be produced.

[4] Economists and other scholars have analyzed alliances from a public-goods perspective. See especially Mancur Olson and Richard Zeckhauser, "An Economic Theory of Alliances," *Review of Economics and Statistics* 48 (August 1966): 266–279; id., "Collective Goods, Comparative Advantage, and Alliance Efficiency," in *Issues in Defense Economics,* Roland N. McKean, ed. (New York: Columbia University Press, 1967), pp. 25–63; Norman Frolich and Joel A. Oppenheimer, "I Get By With a Little Help From My Friends," *World Politics* 23 (October 1970): 104–120; Bruce M. Russett and John D. Sullivan, "Collective Goods and International Organization," *International Organization* 25 (Autumn 1971): 845–865; Mancur Olson, "Increasing the Incentives for International Cooperation," *International Organization* 25 (Autumn 1971): 866–874; and William Loehr, "Collective Goods and International Cooperation: Comments," *International Organization* 27 (Autumn 1975): 421–43.

Figure 2.1–2.4: Cost conditions and the distribution of production among alliance members

A & B = COUNTRIES
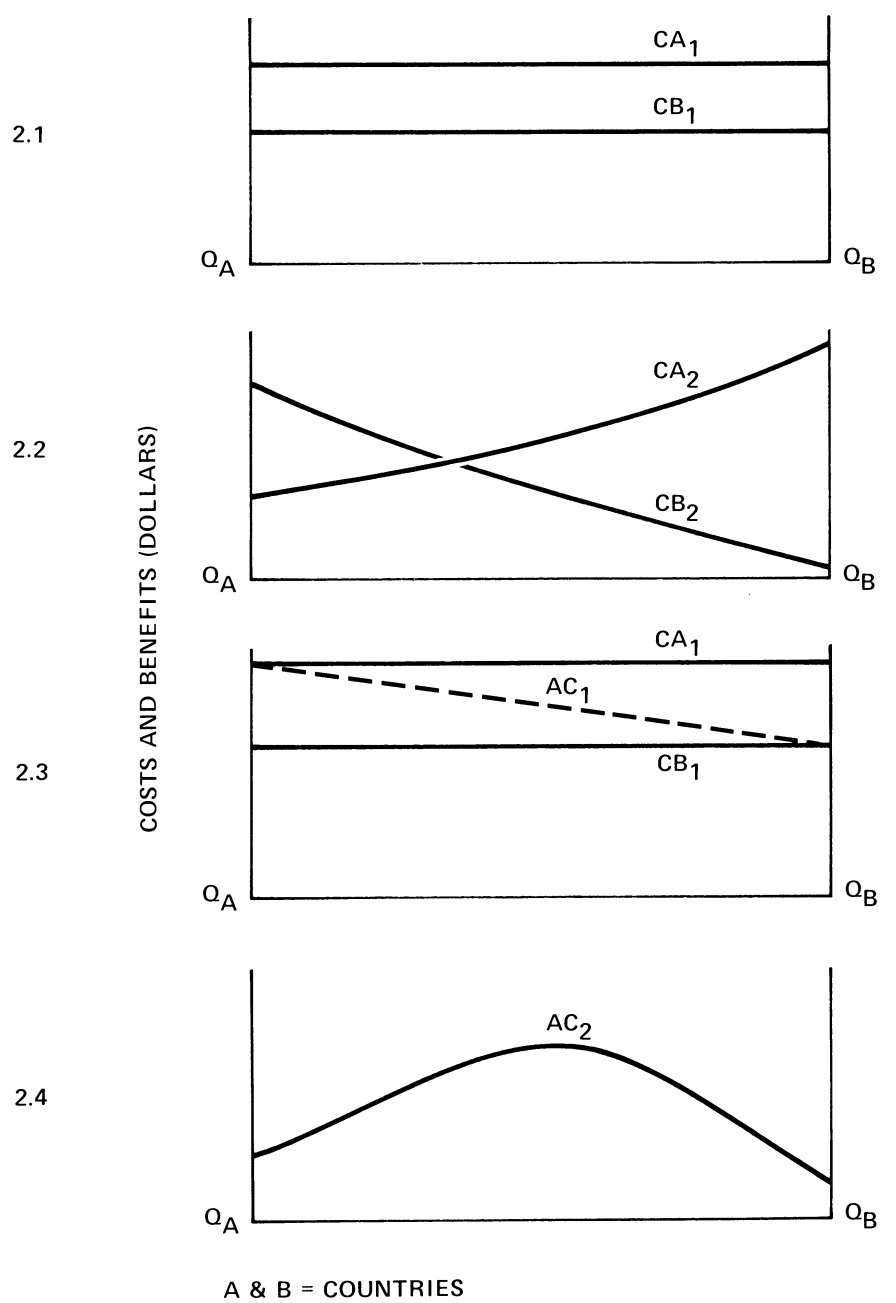
Dollar values of costs (and later of benefits) are measured vertically. At Q_a all production is in country A; at Q_b all production is in country B.

Alliance cost conditions

If there are no economies of large-scale production, the cost curves would be horizontal lines such as CA_1 and CB_1 in Figure 2.1. In the constant-costs environment country B is the low-cost producer, and the most economically efficient outcome would be for all production to take place in country B.

In Figure 2.2 economies of scale are introduced. Country B's quantity of production runs from left to right, and vice-versa for country A. Economies of scale in this case are more pronounced in country B, and the least-cost alternative is again to produce all the alliance hardware in country B. But note that it would also be more efficient to produce all the hardware in country A rather than to divide production evenly between the two countries.

The results of dividing production between the two countries are illustrated in Figures 2.3 and 2.4. In Figure 2.3, which corresponds to Figure 2.1, the cost (AC_1) of dividing production between the two countries rises continuously as a greater proportion of production is shifted to country A. This rate of increase (the slope of AC_1) will be greater, the greater is the difference in cost between countries A and B. In this case, as will be considered later, there is a constant trade-off between the total costs of production for the alliance and the distribution of the location of production among alliance members.

In Figure 2.4, which corresponds to the case of economies of scale in both countries in Figure 2.2, there is not a constant trade-off between costs and location of production, and the costs of dividing production fairly evenly between the two countries may be quite high—that is, maximum cost to the alliance for the hardward is obtained along the hump of the cost mountain given by AC_2.

Alliance benefit functions

It will now be useful to introduce a benefit function to our analysis.[5] Assume that the alliance output is a pure public good to both countries, that both countries perceive no positive or negative externalities from the production of alliance output in their own countries, and that they have agreed on the total quantity the alliance should provide (Q_aQ_b in the preceding diagrammatics) and the proportion of the total output each should buy (we will assume for convenience of exposition that each buys half). In such a case the decision on the location of alliance production is an easy one; all

[5] For convenience we make the hypothetical assumption that decision makers' evaluations of benefits and, later, of utilities can be expressed in dollar terms.

Figure 3: Benefit functions and the distribution of production among alliance members

A & B = COUNTRIES
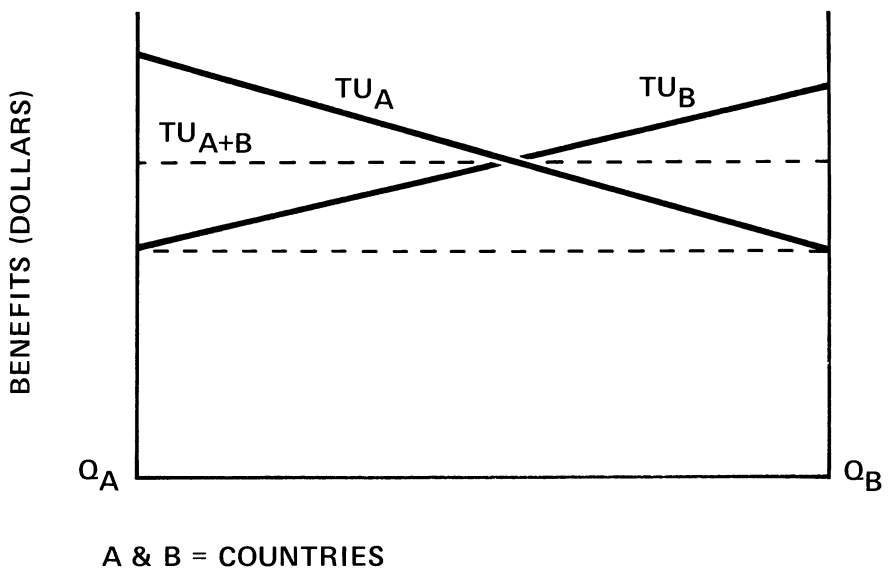
production will be located in the country which can produce the output at least cost, country B in our example.

Further, however, suppose that we drop the assumption of no perceived positive or negative externalities from the location of alliance production. In particular assume that for reasons of prestige, domestic employment, greater security if the alliance breaks up in the future, or similar reasons, the governments of country A and country B perceive considerable benefits from defense production being located in their countries. Their perceived benefit functions will have two arguments. The first argument is the general security benefit from the possession of defense output by the alliance, a benefit that is independent of the location of production and that is denoted by general utility curves (GU) in our subsequent analysis. The second argument is the specific benefits perceived from the location of defense production in their own country and is denoted by specific utility curves (SU) in our subsequent analysis. On the assumption that countries A and B derive the same level of general benefits from the production of the defense output, we may place each country's SU curve on the top of a common GU curve yielding the total utility curves (TU) in Figure 3. If we assume that country A and country B are identical with respect to their perceived specific benefits as well, then the total

Figure 4.1–4.2: Probability of agreement functions and the distribution of production among alliance members
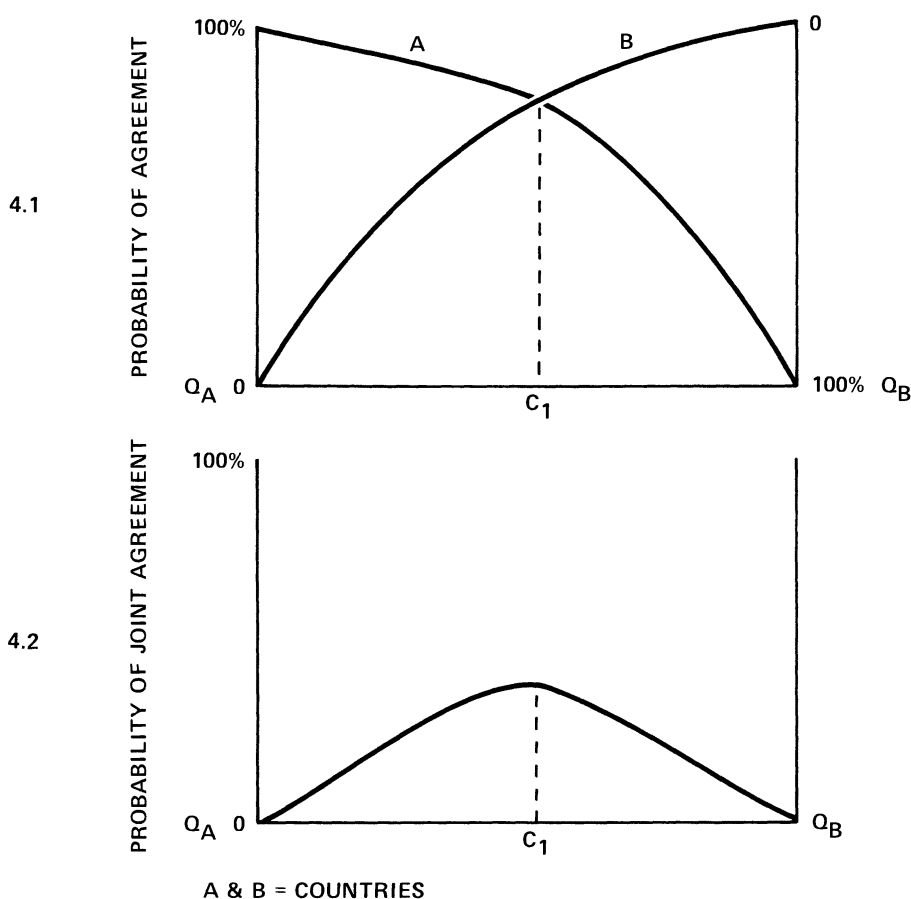
A & B = COUNTRIES

benefit to A plus B will be constant with respect to the distribution of production (as given by the horizontal TU_{a+b} curve in Figure 3).

Probability of agreement

Where costs are the same in the two countries, this benefit condition would make the allocation of production decision a constant-sum adversary game, and it would be likely that the outcome of such a game would be an agreement to produce half of the alliance output in each country. But as long as an agreement on any allocation was reached, the solution would be efficient in the sense that the maximum potentially achievable net benefits (utility minus cost for country A plus country B) would be achieved. If costs are less in one

country than the other (as in the construction of the various panels of Figure 2.1–2.4), the game would be positive-sum, although there would remain the linkage problem since the more efficient producer cannot compensate the less efficient one for the disproportionate location of production in the former's country.

As we stressed in our earlier discussion of negative-sum tactics in negotiations, there would still be some possibility that agreement would not be reached if each party unsuccessfully tried to bluff the other into granting a disproportionate share of the benefits. In such a bluffing game the country seeking to secure a disproportionate share of the benefits would balance the value of its additional gains (times the subjective estimate of the probability of its securing them) against the prospective net loss if agreement were not reached (again, times the subjective estimate of the probability of this occurring). In general we would expect that the probability of agreement would decline as the skewness of the resulting distribution of benefits increases. Thus in our example the probability of successful agreement, depending on the initial allocation offer by each negotiator, can be derived as in Figure 4.1–4.2. Figure 4.1 gives the probability of agreement functions as viewed by each country, and Figure 4.2 derives a probability of mutual agreement function from Figure 4.1. The probability of successful agreement is therefore larger, the more even is the resulting distribution of benefits from agreement.

Given countries' basic risk-taking preferences and perceptions about their abilities to try to bargain with the other country, the likelihood that countries would take large chances of not agreeing would decrease as the size of the general benefits of the agreement increased and as the size of the specific utility from the distribution of alliance production decreased. In other words, the higher is the GU curve and the lower is the slope of the SU curve, the greater would be the chances of successful agreement.

The ability to make side payments

Where the specific benefits are important and the general benefits are low relative to costs, the odds of reaching successful agreement may fall drastically. Consider the following example where the general benefits from the alliance are less than costs of production, but specific benefits are quite sizeable. In Figure 5.1 and 5.2 we present a new curve, which represents net general utility (NGU) after subtracting the cost of production at each alternative distribution of alliance production, Q_a through Q_b. In Figure 5.2 we add the SU curve for each country, and in Figure 5.3 we present the resulting net total utility (NTU) curves for each country. In this case there is a strong possibility that in the absence of side payments agreement will not be reached even though there is the possibility of large total benefits being generated by the alliance. Although there are large net total benefits to A and B combined from the provision of a large number of combinations of production allocations, there is no point at which *both* A and B have positive utility. As is

Figure 5.1–5.4: The potential costs of the inability to make side payments

A & B = COUNTRIES
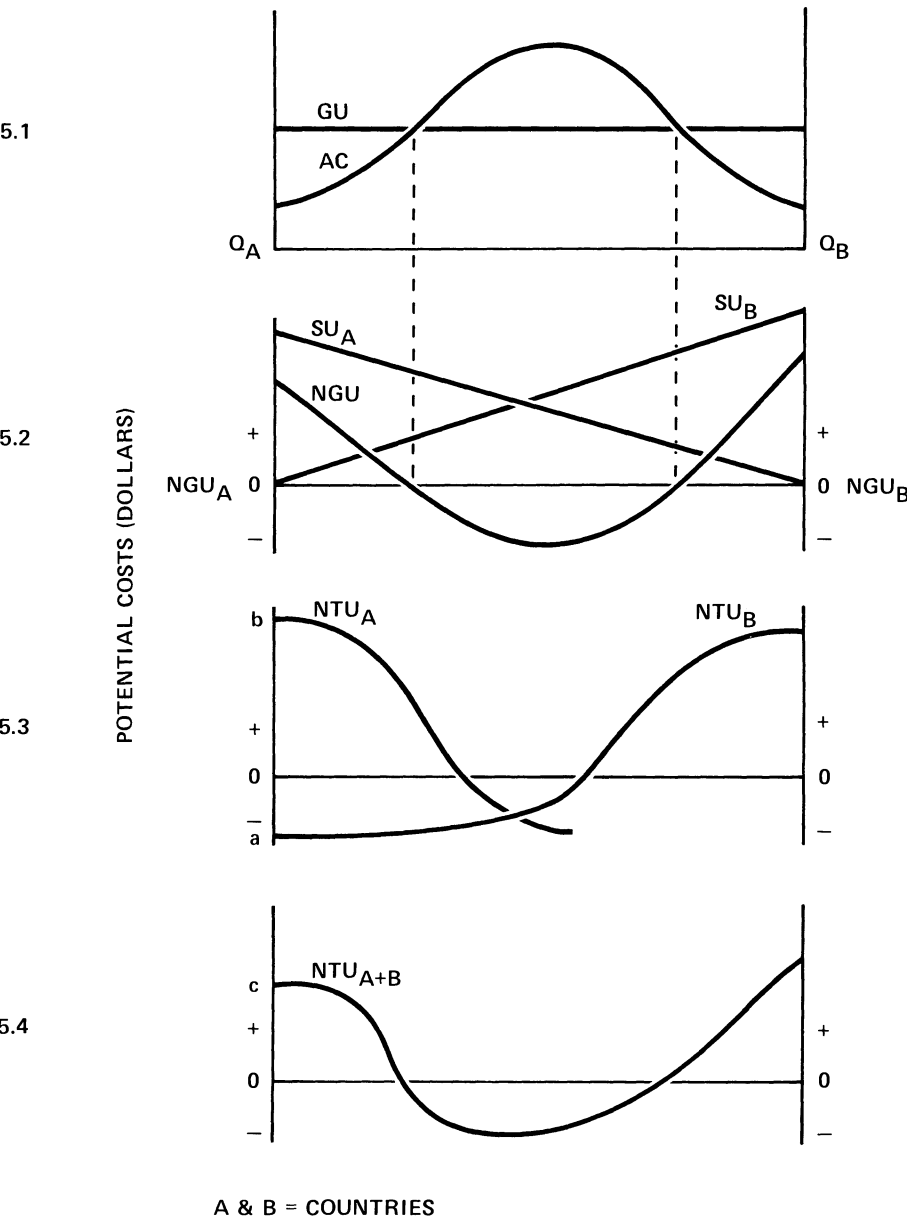
indicated by the joint NTU curve in Figure 5.4, considerable potential welfare will be forfeited because of the absence of terms which will mutually benefit both parties. Since Ob in Figure 5.3 is considerably greater than Oa (in Figure 5.4 Oc = Ob − Oa in Figure 5.3), A could offer a side payment to B of an amount somewhere between Ob and Oa to have all production in A. Such a side payment would leave both A and B better off. Similarly, B could make such an offer to A to have all production in B. Thus even apart from the types of problems of failing to reach agreement because each party tries too hard to skew the proportion of mutual benefits heavily in its favor, in this example there is no way that both A and B can gain utility from an alliance in the absence of side payments. Thus if this is a one-shot negotiation in isolation, there is a strong possibility that it will fail.

A major principle of linkage

As we have stressed, explicit side payments are usually very difficult to make in international political decision making. There is, therefore, considerable likelihood that direct side payments to reach agreements that would benefit both countries would not be feasible. In such a situation the best alternative may be to attempt to find another area of negotiations which has highly skewed benefits. Then by linking the two negotiations so that high benefits go to A in one area and high benefits go to B in the other, there may be a possibility to secure agreement in both negotiations in a way that brings benefits to both countries and brings the outcome much closer to the aggregate efficiency or potential welfare frontier.[6]

The easiest situation in this case would be where there were two important types of military hardware (planes and missiles) of roughly equal volume and with economies of scale which were independent of each other. Then it would be a fairly simple matter to reach agreement to produce all of one type of hardware in country A and all of the other in country B. It is doubtful that one could often find exact mirror-image conditions for such a linkage so that the limits of potential welfare could be obtained, but even roughly offsetting distributional patterns could increase substantially the odds of agreeing on linkages that would bring countries closer to the efficiency frontier.

Linkages and information costs

In searching for possible linkages to facilitate movements toward the efficiency frontier, it frequently may be necessary to seek agreements which cut across broad issue areas. In such a case the search for offsetting patterns of net benefits will be limited by the increased complexity of the negotiations and

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[6] The latter terminology in the present context refers to the capture of the benefits of agreement by the two countries relative to the previous case in which the inability to make side payments led to a lack of agreement and to the loss of such potential benefits.

Figure 6: Linkage with information costs and uncertainty
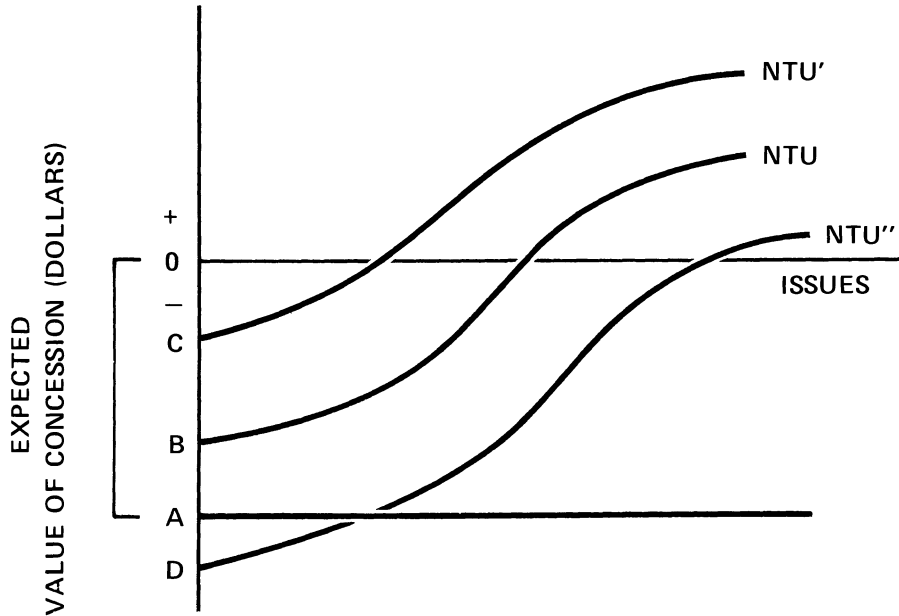
the increased difficulty for the officials attempting such linkages to have a good idea of what the costs and benefits in each issue area really look like. Thus, limits on information-processing ability at the level of top decision making will constrain the number and types of issues which can be effectively linked.

Consider the following example. Suppose a high-level official is debating a potential linkage to secure an agreement which he feels is worth OA (evaluated in the official's own terms) to the other country in Figure 6. The official's point estimate is that this concession would cost him only OB. Since OB is a smaller negative value than OA, the expected value of this linkage would be positive. Suppose, however, that the official is quite uncertain about the actual outcome. Then NTU (B) is bounded by a range of possible outcomes, such as NTU (C) and NTU (D). The lower part of this range (AD) yields outcomes which are worse than OA. The expected value of linkage in this range thus turns negative, and a risk-averse official might not therefore approve the linkage.

For such reasons some potential welfare will probably be traded off to achieve more balanced distributional effects where this is feasible within a particular issue area. Consider our original example with constant but different costs of production, but where the difference in costs is not too great.

Below in Figure 7.1 we combine the SU and GU schedules from Figure 5 with the cost conditions in Figure 2.1. In Figure 7.2 we subtract the cost conditions to give the net benefit curves for countries A and B, respectively. Finally, in Figure 7.3 we derive an aggregate potential welfare curve which reflects the net effect of the various production allocations between the two countries in Figure 7.2.

In Figures 7.2 and 7.3 it is clear that aggregate potential welfare is maximized by producing exclusively in B. In such a situation, however, the probability of unlinked agreement is zero, as country A's net benefits are negative at that point. By shifting the production allocation to point C, one begins to get a positive probability of agreement at a cost of XZ of potential welfare. The probability of agreement would be maximized at a point near D with a cost of potential welfare of ZY.[7] So within a given issue area where it is difficult to find other areas of negotiations for linkage purposes, some potential welfare can be traded off in order to enhance the odds of an agreement.

Summary

This theory of optimal negotiations stresses the factors that influence the degree to which countries can obtain the benefits or potential welfare offered by collective agreements among themselves. Where there are constant or increasing costs for alliance hardware and cost differentials are not too great among countries, we find that collective agreements are facilitated without the need for linkages on the grounds that under such conditions one can obtain a balanced distribution of benefits by allocating alliance production fairly evenly among members with only a minimal efficiency cost.[8] Where there are substantial economies of scale in producing alliance hardware, however, the inability to make side payments in international relations will tend to frustrate the attainment of potentially beneficial collective agreements. This same type of problem also arises where the perceived benefits from having own-country production of alliance hardware are high. For these cases we stress the importance of linking issues in such a way that the cost or benefit skewness among the countries is offsetting. Linkage in this manner should promote potentially beneficial agreements. Information and other types of transaction costs will constrain this type of issue linkage to some extent. We

[7] We defer considerations of the costs of decision making until the next section, but it should be apparent here that where ZY is small, the attempt to link issues may cost more than it is worth.

[8] Although we did not analyze the increasing-costs case in the text, it is easy to understand how unlinked agreement is facilitated under these conditions. Namely, where the cost of alliance production rises monotonically in each country, the conflict between alliance efficiency and distributional effects dissipates, that is, the objective of maximizing potential welfare (a least-cost allocation of production) becomes more congruent with spreading production fairly evenly among countries.

Figure 7.1–7.3: The trade-off of production efficiency to obtain an agreement

7.1

Q_A Q_B

POTENTIAL WELFARE (DOLLARS)

7.2

+   +

A 0   0 B

C

−   −

7.3

Z

X

Y

A 0   0 B

D   C
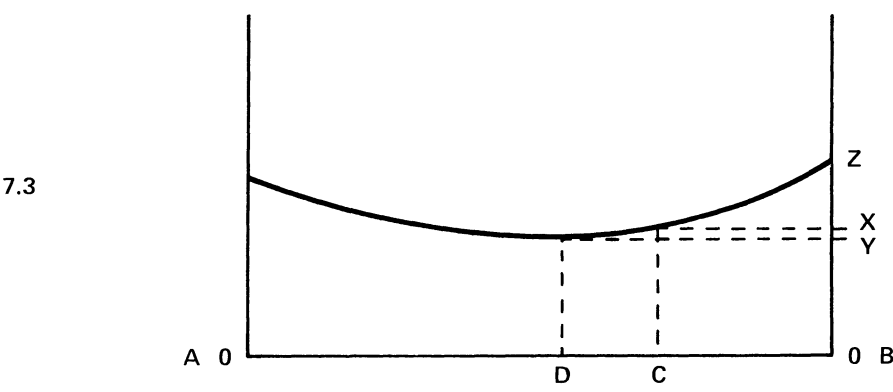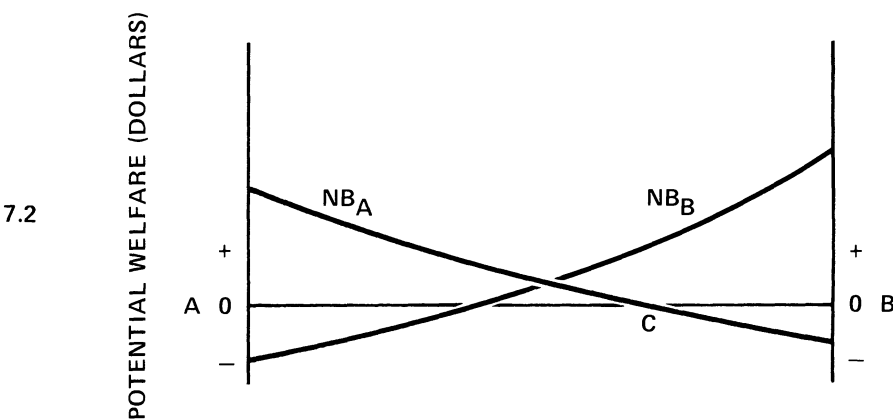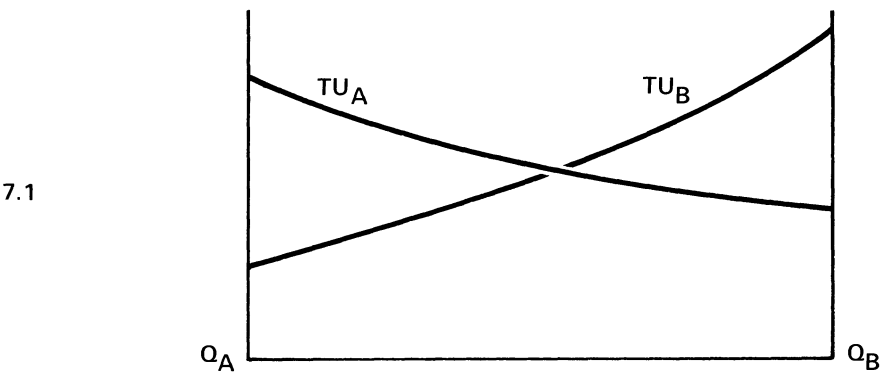
A & B = COUNTRIES

thus generally expect that negotiators would be willing to trade off some amount of potential benefits from agreements closer to their preferred positions in order to increase the likelihood of reaching an agreement in a given issue area.

Qualifications and extensions

Our theory of issue linkages for mutual benefit is a new theory (we believe), and like most new ideas, it is subject to certain qualifications. The first task, therefore, is to present some of the qualifications and complications that accompany our analysis. Moreover, our statement of a mutual benefit theory of issue linkage is not likely to be the last word on the subject. We would thus also like to take the opportunity in this section to consider some possible extensions of our analysis. We begin by considering two qualifications—the relevance of single-actor models of economic self-interest for international negotiating processes and the impact that discontinuous policy options have in our theory—and then proceed to consider several possible extensions.

The relevance of single-actor models

As we have noted, our analytics are based on single-actor models and on the assumption that negotiators are efficient representatives of their countries' interests. While we feel that this is a reasonable approach to developing a general statement of our theory, we are quite aware of the limitations of such an approach in analyzing international negotiating processes.

Indeed, what constitutes individuals' and nations' conceptions of their self-interests is not a trivial question, nor will it be the same for all individuals and groups at all points in time. Both in terms of explaining behavior in international affairs and of designing "good" international institutions, it is desirable to know the weights placed by different actors on economic, political, social, and humanitarian objectives, and their views of how these are affected by alternative policy outcomes and institutional arrangements. Likewise, in many instances the objectives of negotiators and policy makers may differ from what might be judged from various perspectives to be the overall interests of the nations they represent. Indeed, there is frequently as much or more disagreement within than between countries about appropriate international policies. Our conclusion, then, is not that the assumptions of self-interested behavior are useless in explaining and predicting national behavior in the international arena, but rather that frequently one runs into trouble in attempting to explain the behavior of nations as if they were monolithic entities. In fact, nations are made up of many actors with varying stakes in international policy decisions, and we must frequently go further to

explore the institutional framework within which decisions are made and carried out.

Within various nations, officials may develop particular interests of their own which cause them to pursue different outcomes from those which would be favored by the informed voter. A popular example is the negotiator whose personal reputation becomes so tied up in securing completion of a complex negotiation that by the final stages he becomes more concerned with seeing that an agreement is reached than that the contents of the agreement are in the interests of his country. Such divergences of interests between decision makers and voters may exist not just with respect to particular policies but also with respect to the overall amount of attention and resources devoted to international activities.[9] As will be discussed below, such considerations are likely to make it more difficult to link issues successfully.

Analysis of actual policy making is further complicated by the fact that countries may frequently act on the basis of an "incorrect" view of the nature of the situation. A fascinating area of study is the way in which decision makers and negotiators obtain their views of "economic reality" and the processes by which these views are changed. Even if countries always followed their economic self-interest as they perceived it, their perception of economic self-interest may not always appear to be correct or invariant over time. Likewise, in many areas economically desirable outcomes may specifically be ruled out by overriding political or foreign policy considerations, or economic interests in one area may be sacrificed for what are judged to be greater gains in another area. The discovery that arguments are incorrect does not mean, of course, that those who were making them were necessarily deceived. Arguments, whether true or not, may be useful in negotiating, and an individual may know the correct argument, but ignore it for political purposes.

Again, however, such considerations do not render the analysis of policies on the basis of single-actor models of economic self-interest useless. Rather, they suggest that such tools must be applied with care and with due regard for the complexities of particular situations. The fact that countries do not always follow their economic self-interest as viewed by the external analyst does not preclude analyzing behavior from this perspective. Indeed, categorization of the types of instances in which countries do not follow their economic self-interests is an important avenue for study. So are the ways in which countries resolve conflicting economic interests of their own citizens. In such instances the use of economic analysis offers insights, although it is not a magic guide to all of the intricacies of explaining and predicting outcomes of international economic deliberations.

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[9] There is considerable literature on this question emanating from a paper by Anthony Downs on "Why the Government Budget is Too Small in a Democracy," *World Politics* 12 (July 1960): 541–563. For a review of this literature, see R. C. Amacher, R. D. Tollison, and T. D. Willett, "Budget Size in a Democracy: A Review of the Arguments," *Public Finance Quarterly* 3 (April 1975): 99–121.

Discontinuous policy options

A second way in which our earlier analysis must be qualified concerns the assumption in our theoretical model that negotiators face continuous policy options. In other words, it was assumed that a negotiator could trade a little more or a little less of each policy option in order to reach agreements. Any observer will note that this condition is not terribly descriptive of actual relations among governments. There is typically lots of discontinuity among policy options, and one often faces difficult all-or-none choices between policies (e.g., fixed versus flexible exchange rates). There thus may be a conflict in such cases between technical efficiency (i.e., reaching an agreement) and freedom to distribute the benefits from a positive-sum agreement.

The basic point to keep in mind in such a case is that discontinuities are likely to increase the importance of issue trades. The point here is analogous to how to divide the baby between separated parents. The child cannot be cut in half, and some sort of sharing mechanism must be arranged. The answer to this type of dilemma lies in searching for ways to make side payments. Issues on which reaching technically efficient agreements are difficult must be linked with other issues in order to make trade possible; they can be decided in isolation only at great costs in terms of failing to reach agreements. Returning to our alliance example, consider the issue of who makes airplanes for the defense alliance. Where there are large economies of scale in producing the airplane, it will be difficult to reach agreement on who gets the production contract, and linkage will be important under these conditions. Where there are no economies of scale in producing the airplane, one can obtain lots of equity at a small efficiency cost by distributing the production around the alliance countries. Linkage will be less important in such a case. The point, therefore, is to stress the importance of arranging for side payments through issue linkage where it is difficult to reach technically efficient agreements on an issue.

Linkage and the aggregation of issues

There are a number of aspects of our analysis that would appear to be fruitful areas for further research. The first concerns the relationship between issue linkage and the level of aggregation at which decisions among nations are discussed and implemented. This problem has become an increasingly important item of discussion in the literature. For example, in a well-known paper by Keohane and Nye, an operational distinction between intergovernmental and transgovernmental as two forms of communication between governments is stressed.[10] The former type of communication refers to the formal or traditional pattern of international diplomacy which flows

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[10] R. O. Keohane and J. S. Nye, "Transgovernmental Relations and International Organizations," *World Politics* 27 (October 1974): 39–62.

through regular channels for coordinating foreign policy at high levels of government-to-government contact. The latter type of communication refers to contact between ministers and officials in governments without detailed clearance by high levels of the central government. The level at which negotiations take place, then, is the primary matter of concern in such a distinction. The question we pose is whether there are any general principles in our discussion of the theory of linkages that will enable some rough conjectures to be given to questions such as how many issues should be included in a decision-making package and at what level should governments negotiate in matters of international policy?

The main point that we wish to make in this regard is that where issues are well understood by negotiators, issue linkage and the aggregation of issues to be decided by top decision makers may be desirable for promoting agreements. This follows from the fact that more issues can be brought to bear in arranging for positive-sum trades in negotiations among governments. Thus attempts to reach agreement by negotiating on one issue at a time are likely to be frustrated because of the inability of participants to make side payments, and by aggregating issues and dealing with them at the highest levels of government, there is greater scope for indirect trades that will lead parties to efficient agreements. The basic idea here is similar to the way in which vote trading in legislatures can contribute to more efficient collective choices. We recognize that some observers disapprove of vote trading ("logrolling"), but recent contributions to the theory of public choice emphasize that vote trading in the appropriate institutional setting is a method for voters to obtain mutually beneficial bargains.[11]

It is clear that terminology such as "the appropriate institutional setting" is difficult to carry over to real world international negotiating processes. Factors such as external effects to parties who are not privileged to be a part of a negotiation—decision making, information costs (discussed below), intransitivities in voting outcomes, and so forth—may present formidable difficulties to the argument that vote trading within existing international institutional arrangements is an unmitigated good. The question of what is the appropriate institutional setting in the international context is therefore an important topic for further research.

The argument for vote or issue trading is not as strong where issues are not well understood by negotiators. For example, there may be no agreement on what is the best direction for policy to take. An excellent example of this condition would be discussions of fixed versus flexible exchange rates in the area of international economic policy. One can find scholarly and political opinion on both sides of this issue, and in such a case to link and aggregate

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[11] For a general discussion of this point with references to the literature, see D. C. Mueller, R. D. Tollison, and T. D. Willett, "Solving the Intensity Problem in Representative Democracy," in *The Economic Approach to Public Policy*, R. C. Amacher, R. D. Tollison, and T. D. Willett, eds. (Ithaca, New York: Cornell University Press, 1976), pp. 444–473.

issues at higher levels of decision making might be viewed largely as increasing the risk of making an agreement which will turn out to be disadvantageous, and as a result, might only intensify government-to-government conflict.[12] A variant of this example is where there is consensus among experts about the nature of the issues, but the issues involved are so complicated that higher-level officials can never spare the time to become well informed about the nature of the relevant trade-offs. Hence the complexity of the issues involved restricts the degree to which they can be linked and aggregated in some cases. In these circumstances government-to-government contact possibly could be handled at lower levels, and the work here would involve primarily the technical task of clarifying the nature of the issues for higher-level decision makers. Wallace, for example, outlines nicely some of the reasons why handling issues at a lower level might be appropriate.[13]

However, shifting the issue linkage problem in highly technical policy areas to lower levels of government opens the linkage process to yet other considerations. Domestic bureaucratic constituencies will have an important impact on the types of issues that can be successfully linked. For example, attempted linkages of certain policy areas may lead to disharmony among national bureaucrats. A pertinent example from the law of the sea negotiations would be the desire of U.S. defense officials for guaranteed freedom of transit through the world's straits relative to the interests of U.S. economic officials in promoting an efficient use of ocean resources. While the defense officials might be willing to trade off economic interests heavily to obtain their goal of unfettered ship transit, the economic officials are likely to place a much lower evaluation on the worth of freedom of transit relative to the case for efficient exploitation of ocean resources, and squabbling among bureaucracies will inevitably break out. The point is simply that domestic bureaucratic interests will affect the types of issue areas which can be successfully linked. In general, divergences in such interests will make linkage more difficult.[14]

So while the demands on high-level decision makers make it apparent that they will have little time to absorb information about the relevant trade-offs among highly technical issues, the relegation of these issues to lower levels of government-to-government contact opens the door to conflicting views among

[12] Uncertainty over the proper direction for policy does not, however, imply that there will not be issue trades in any event.

[13] Wallace, op. cit. We should stress, however, that this is a complicated problem and that under some circumstances linkage can be used to bring about agreement irrespective of poor understanding or of fundamental disagreements over proper policies. A helpful referee gives the following example. At the time of the Bretton Woods Conference the U.S. and U.K. disagreed particularly over the question of the role of discriminatory trading blocs in the postwar economic order. The U.S. linkage of Lend Lease and postwar credits to the dismantling of Imperial preferences helped bring about an agreement.

[14] Two recent papers in *International Organization* are closely related to this theme. See Peter J. Katzenstein, "International Relations and Domestic Structures: Foreign Economic Policies of Advanced Industrial States," *International Organization* 29 (Fall 1975): 1021–1034; and Raymond F. Hopkins, "The International Role of Domestic Bureaucracy," *International Organization* 30 (Summer 1976): 405–432.

domestic bureaucracies as to what the proper policy should be. The level of aggregation at which decisions among nations are discussed and made thus involves some difficult trade-offs in practice. This is an area where scholars with expertise in particular policy areas can make useful contributions by examining the nature of these trade-offs in their particular areas of interest.

The costs of negotiating

Another important issue which was not directly considered in our theoretical presentation concerns the effect of the number of negotiators (both among and within countries) on negotiating processes. In other words what happens if we increase the number of effective decision makers in our analytical framework? The result is straightforward—increased decision costs. Where there are a given number of issues to be decided, the greater the number of decision agents the more difficult it will be to reach agreements. Thus debating international issues in large forums should tend to be a quite costly way of reaching collective agreements because, for example, the cost of keeping in touch with trade-offs on issues is increased immensely since there are more positions that have to be known in order to reach agreements. In general we expect that the greater the number of actors, the more difficult it should be to arrange linkages, so that each negotiator should be willing to accept greater deviations from the efficiency frontier to achieve a more balanced distribution of benefits within an issue area. This general rule, however, must be applied carefully in practice. For example, although there may be a large number of decision makers involved, where countries fall into blocs with similar interests, the process of bargaining and issue linkage should be facilitated.

We suggest as a basic principle to follow in this area that the number of actors involved in a negotiation be confined to those with well-defined stakes in the outcome. It makes little sense to give individuals votes on issues where the outcome does not affect them (positively or negatively). Normally in bargaining among governments where agreements are voluntarily reached and no country with a well-defined stake in the outcome is denied a voice, this condition should be roughly met. Countries without stakes in the outcome are not involved in the negotiations. In bargaining in international organizations, however, this condition may not be met. Each country often has an equal vote on an issue whether or not it has a positive or negative stake in the outcome. As will be discussed below, this not only increases decision costs dramatically, but also makes the possibility of capricious outcomes more likely. A considerable problem is where to draw the line when there are many countries with legitimate, but small, stakes in an issue. In such cases, there may be a strong conflict between the probability of securing agreement and the equitable representation of all affected parties. The scope for successful issue linkages should be greatest where the number of decision makers is small and where

"voting power" is tailored to the underlying stakes of decision makers in the outcome.

Voting rules

Another implicit assumption of our theoretical model was that both parties must agree before trades can be consummated. The implicit voting rule in such a case is unanimity. Unanimity will typically be the case where countries voluntarily enter into international negotiations since they can withdraw from agreements if they object to them. Yet in international organizations where some negotiations are carried out, the voting rule implicit in producing an outcome is rarely unanimity. In such a case the voting rule will influence the process of negotiations. At a very simple level the degree of restrictiveness will influence the level of decision costs for a given number of decision makers. A more restrictive voting rule thus increases the costs of reaching collective decisions while giving minorities greater protection against adverse outcomes. Our point in this context is that fewer issues will be successfully linked where it is relatively more costly to obtain agreements.

Voting rules also imply different distributions of political income. One nation-one vote is only a particular distribution of political power. Different countries have different stakes in different issues, and one nation–one vote is not necessarily tailored to these stakes. So even where there is an enforceable mechanism such as majority voting for international collective decision making, an optimal outcome is not guaranteed by this fact. Where voting power differs substantially from the distribution of potential costs and benefits to be derived from voting, collective outcomes may be both inequitable and inefficient. Attempts to skew the cost and benefits of outcomes by the majority of countries may result in the underprovision of the collective good in question.[15] Essentially, the provision of international public goods is a mixed-motive game with the scope for potential benefits to all countries from the provision of the public good yielding cooperative elements, the positive-sum aspect of the game, while the desire to minimize one's share of the cost of providing the public goods leads to competitive zero or negative-sum elements. Attempts at securing too great a share of the benefits run the risk of ending in failure of the good to be provided in sufficient quantities (or

[15] This point has not yet been sufficiently recognized in discussions of the optimal provision of international public goods. For example, in their classic paper "An Economic Theory of Alliances," *Review of Economics and Statistics* 48 (August 1966): 266–279, Olson and Zeckhauser show how the failure to have collective agreements can result in the underprovision of international public goods, but fail to consider how in this model the ability to achieve optimality through binding international agreements would not be invariant to the voting rules adopted. For further discussion on this point, see Robert D. Tollison and Thomas D. Willett "International Public Goods and the Economic Theory of Alliances," in *The Challenge of Economic Interdependence: A Public Choice Perspective* (in progress). For recent discussions of the Olson-Zeckhauser model, see the references cited in footnote 4.

sometimes even at all). The prospect for underprovision in such circumstances is enhanced by the fact that it is usually far easier for nation states to withdraw from international agreements than it is for citizens to withdraw from the effective jurisdiction of national political decisions. Thus, where the implicit weights on votes do not coincide with the stakes that countries have in issues, countries may tend to withdraw the consideration of those issues from forums where one man-one vote procedures apply.

Weighted voting would not be, however, a panacea. For one thing it is not necessarily an easy voting scheme to administer. The weights must be designed in an appropriate manner, and this problem can be complicated where countries' positions change over time and where there is wide variation in exactly what constitutes a country's "interest" on different issues. Even in international forums where voting processes are important, the feasibility of weighted voting depends to a large extent upon a stable pattern of interests over time.

The emergence of new issues of a discrete and important nature in international affairs should necessitate a great deal of flux and flexibility in arranging forums for the discussion of international issues. Thus, many negotiations tailored to underlying stakes and issues will be likely to take place outside of formal international organizations. While untidy, this may contribute to a more efficient pattern of international agreements because of the possibility of creating effective weights of voting power of participants which more closely approximate their interests in particular issues.

Summary and conclusion

We have presented a theory of issue linkage for mutual benefit. Our theory stresses issue linkage as a means of overcoming distributional obstacles to international agreement where direct side payments among countries are not a politically feasible alternative. The mutual benefit theory contrasts with and supplements the traditional rationale for linkage in terms of extending one's leverage in one area of negotiations to other areas. Integration of these two approaches is not attempted in this paper, but we believe that it is an important task for future research on issue linkage.

The qualifications to our analysis that we stressed concerned the relevance of single-actor models of economic self-interest to international negotiating processes and the impact of discontinuous policy options on the process of issue linkage. We suggested several possible extensions of our analysis.

Some of our more important conjectures were that: a) linkage and aggregation of issues should help to promote agreements where issues and the trade-offs among issues are well understood by top decision makers; b) where there is fundamental disagreement about the proper policy, linkage and aggregation of issues should be less useful in promoting agreement among

high-level decision makers; and c) issue linkage should be less important in international forums where the costs of linkage are high due to large numbers of effective decision makers, either because of a large number of countries participating or because of multiple interests represented for each country.

We also briefly discussed the influence which voting rules can have on the difficulty of reaching international agreements and on the efficiency and equity of such outcomes. In our judgment such considerations of the appropriate institutional setting for vote trading or issue linkages represent an extremely important topic for further research.

We believe that our theory of issue linkage for mutual benefit offers a useful set of analytical tools in both a positive and a normative sense. In a positive spirit our analysis offers an explanation for issue linkages that do not seem to fit the traditional rationale of expanding one's bargaining power into other areas. In a normative sense our theory provides the beginnings of a framework within which the performance of international institutions in promoting cooperative actions among countries can be evaluated. In both respects we hope that the approach to issue linkages for mutual benefit begun in this paper can make useful contributions to the understanding and design of international negotiations and institutions.