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WELFARE AND CUSTOMS UNIONS

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ABSTRACT

This paper proposes that Viner's celebrated trade diversion and trade creation terminology for the customs union problem be abandoned. As the alternative is offered a welfare calculus based upon the terms-of-trade and volume-of-trade taxonomy from the theory of tariffs. The paper discusses, by application of this calculus, the two outstanding controversies in the theory of customs unions.

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I. Introduction[1]

Economic integration is redrawing the map to an extent never before seen in peace time. As the Germanies become one nation, the Europeans form a true economic union, and the United States proposes working towards a free trade zone of the Americas, the two fundamental questions of coalition formation have become as topical as ever: Who does what with whom? How does the formation or expansion of coalitions affect the welfares of individual countries, member nations, and the global trading community?

One of the oldest literatures on coalition formation considers the customs union, a group of countries agreeing on internal free trade while setting common tariffs on trade with non-member nations. Although this is a literature of considerable volume, it is a matter of controversy whether the fundamental questions have been satisfactorily answered. Few would go as far as Pomfret (1986), who recently labelled the customs union theory as "one of the most disappointing branches of postwar economics." Yet it is beyond dispute that much effort has gone into establishing what remains a quite small number of results, which furthermore, and in the words of Lloyd (1982), in some cases are "contradictory."

The contention of this paper is that customs union theory is suffering greatly from the use of an analytic terminology, which is not only ambiguous but also inefficient. In his celebrated *The Customs Union Issue*, Viner (1950) proposed that the formation of a customs union involves two fundamental effects: A change in location of production of imports from a lower-cost non-member country to a higher-cost member country, and a change in location of production from higher-cost domestic producers to lower-cost producers in the member country. Viner proclaimed, furthermore, that the former effect, which he denoted as *trade diversion*, was welfare reducing, while the latter, which he dubbed *trade creation*, was welfare enhancing. If diversion exceeded creation of trade, the formation of a customs union, which represents a liberalization of the international flow of goods, could paradoxically reduce global welfare. It is correct that trade creation raises welfare, however, trade diversion

[1] I thank Ronald Jones, Leonard Cheng, James Dana, Jr., Michael Knetter, Prakash Loungani, Nancy Marion, Raymond Riezman, Ian Wooton, Alessandro Zanello, and seminar participants at Boston College, Florida, Michigan State, NBER, Penn State, Rochester, and the Midwest Trade Meetings for discussions. I am grateful also for financial support from the University of Copenhagen and the Danish Social Science Research Council, Grant No. 14-3986, as well as a Rockefeller Grant to Dartmouth College. This paper draws upon a chapter of my dissertation.

need not reduce welfare as was pointed out by Gehrels (1956) and Lipsey (1957).[2] Viner's concepts have remained, nevertheless, the pliers with which theorists have attempted to solve the customs union problem.

I propose at this juncture to abandon the language of trade diversion and trade creation. The first reason is that the concepts of trade diversion and trade creation are already infested with too many interpretations. The second, and more important, reason is that the theory of tariffs offers an alternative, and more efficient taxonomy. I suggest that the concepts of *terms-of-trade* and *volume-of-trade* effects constitute the most useful basic tools for customs union analysis, in large part because they provide a natural foundation for welfare expressions for coalitions. Indeed since the formation of a customs union is nothing but a particular type of multilateral tariff reform it would in fact be surprising if the customs union problem should have its own language in the first place.

Section II presents the critique of Viner's terminology and proposes an alternative welfare calculus by introducing welfare expressions for the nation, and for arbitrary coalitions including the grand coalition. Section III applies this calculus to the two outstanding controversies in the theory of customs unions, and Section IV presents a concluding discussion.[3]

II. A Critique of Trade Diversion and Creation, and an Alternative Welfare Calculus

Suppose there are two goods and three countries, and let country 1 be specialized in the production of its export good and purchases its imports from either of countries 2 or 3 at the given prices p_2^e or p_3^e, where costs are such that p_2^e exceeds p_3^e. If country 1 initially applies a non-discriminatory tariff, then it trades exclusively with country 3. Figure 1 illustrates country 1's trade flows where point A corresponds to the initial situation of a non-

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[2] Bhagwati (1971, 1973), Kirman (1973), and Michaely (1976) offered interpretations of what Viner "really had in mind." Meade (1955) proposed as additional channels a trade expansion and a trade contraction effect, Kemp (1969) equated trade diversion and trade creation with reduced and increased trade volumes respectively, Johnson (1974) equated trade diversion with a terms of trade worsening, and trade creation with a larger trade volume, and Collier (1979) introduced several consumption and production effects. None of these interpretations or amendments has gained general acceptance.

[3] Kowalczyk (1988) presents a survey of the customs union theory in terms of the taxonomy presented in this paper.

discriminatory tariff. Suppose that countries 1 and 2 decide to form a customs union, and that the discriminatory reduction of 1's tariff on imports from 2 is sufficient to overcome the cost differential between 2 and 3 implying that all 1's imports are now obtained from country 2. Let point C in figure 1 illustrate country 1's trade flows after forming the customs union. By country 1's switching to a more expensive supplier of its imports, this customs union has involved trade diversion, but it has implied no trade creation as country 1 was assumed to be specialized in production. Since point C supports a higher-valued trade indifference curve than does point A, it has been demonstrated that a trade-diverting customs union can be welfare improving.[4]

The move from A to C can be decomposed into a welfare-reducing move from A to B, capturing the effect from the worsened terms of trade due to the change of trade partners, and a move from B to C, which is welfare-improving due the larger volume of imports of a good that has a higher domestic price in country 1 than the price at which it can be obtained in world markets. These are the terms-of-trade and volume-of-trade effects from the theory of tariffs as discussed by Meade (op. cit.) and Jones (1969), and more recently for higher dimensions by Dixit and Norman (1980) and by Bond (1990). I propose that these, rather than Viner's concepts, be recognized as the basic effects in the analysis of preferential trading arrangements.

Consider a world consisting of K countries trading N goods and assume that each country, k, ($k = 1,..., K$) has a well-defined *Meade* utility function $u^k = u^k(m^k)$, where m^k is a column vector with N elements listing country k's net imports. If p^e denotes the K-element column vector of world prices, then the assumption that country k's trade is balanced can be written as $p^e m = 0$, where $p^e m$ is the inner product. Let $d\eta^k$ denote the change in country k's real income as measured in the units of some arbitrarily chosen numeraire good. If the marginal utility from consuming the numeraire good is given by β^k, then $d\eta^k$ equals du^k / β^k which in turn equals the inner product $p^k\, dm$, where p^k is the N-element column vector of domestic prices in country k. Total differentiation of the balanced trade condition and substitution into the expression for $d\eta^k$ finally yields the basic expression for a change in real income from a change in tariffs,

[4] This counter-argument is due to Gehrels (op. cit.) and to Lipsey (op. cit.).

(1) $$d\eta^k = - m^k \, dp^e + (p^k - p^e) \, dm^k \, ,$$

where $k = 1,..., K$. The inner product in the first term represents the terms of trade effect, while the second term, given by the inner product of the absolute tariff wedge and the change in net imports, defines the volume of trade effect.[5]

Several important questions in the theory of customs unions concern the welfare of coalitions rather than that of individual nations. As was discussed above, Viner pointed out, for example, that welfare of the grand coalition, i.e. world welfare, could fall from some countries forming a customs union, and it is of considerable interest whether a group of countries, when viewed collectively, is better off in a customs union than in a free trade area, say. While global free trade, under the present assumptions, maximizes world welfare, the latter question is related to the more general issue of determining what is the optimal tariff vector, both within a coalition and with respect to outsiders, from the point of view of a subset of the world's trading nations. Assuming that lump-sum income transfers between members are feasible, the criterion of a potential Pareto-improvement applies, and a consistent measure of welfare change for the coalition can be established by adding over all members each country's change in welfare as given by expression (1).[6]

Suppose that a number of countries, C, form a coalition and let $d\mu$ denote the change in collective welfare of all the members of the coalition found by adding their respective welfare expressions as given by (1). If c and d are indices for the members of the coalition, and if f indicates non-member countries, then the welfare expression for the coalition is,

(2) $$d\mu = \sum_c \sum_d (p^c - p^e) \, dm^{cd} + \sum_c \sum_f [- m^{cf} \, dp^e + (p^c - p^e) \, dm^{cf}] \, ,$$

where $c, d = 1,..., C$, and, $f = C+1, ..., K$. The N-element column vector, m^{cd}, indicates the initial volume of trade between coalition members, and m^{cf} is an N-element column

[5] This breakdown of welfare is contained also in Lloyd (op. cit.), who immediately proceeds by solving for changes in volume of trade in terms of substitution and income effects. In one of the first applications of duality theory to customs unions Wooton (1986) presents, for a country k, a welfare expression containing the inner product $- m^k \, dp^k$. This is in standard tariff theory known as the change in consumers' and producers' surplus. Wooton denotes this as a terms-of-trade effect.

[6] This is done by setting equal to zero all but one of the welfare expressions of the coalition members and equating changes in coalition welfare with changes in the remaining nation's welfare.

vector of initial net imports of member countries from non-member countries. Thus the first term expresses the volume-of-trade effects on intra-coalition trade, while the second term is given by the terms-of-trade and volume-of-trade effects of member countries on their trade with non-member countries. Terms-of-trade effects on trade between coalition members do not enter as such effects only redistribute income between members. The intra-coalition volume-of-trade effects contribute positively to welfare of the coalition if the formation of the coalition implies that goods become reallocated to the member countries with the higher domestic prices, that is, the higher domestic valuation.

The expression for a change in world welfare, $d\omega$, which is found by setting all but one nations' welfare changes equal to zero in (1) and then adding for all countries, constitutes an extreme representation of the intra-coalition effect,

$$d\omega = \sum_{k} (p^k - p^e)\, dm^k, \tag{3}$$

where $k = 1,..., K$. Indeed in a world of only two countries, 1 and 2, this would simplify to $d\omega = (p^1 - p^2)\, dm^1$, which displays the intuition discussed earlier, that coalition welfare depends upon the location of goods relative to their marginal valuations.

III. Two Outstanding Controversies in the Theory of Customs Unions

In spite of the difficulties implied by the use of Viner's terminology, only two controversies are outstanding. These involve whether countries trading much with each other are more likely to form coalitions than are countries trading little with each other, and whether a small country can gain anything from a customs union that it cannot obtain from unilateral free trade.

The view that countries with extensive mutual trade are likely to establish preferential trading agreements, supported by the creation of institutions such as the EEC, EFTA, and more recently the free trade agreement between the United States and Canada, was offered a theoretical underpinning by Lipsey (1970), who established that "given a country's total volume of international trade joining a customs union is more likely to raise its welfare the

higher is the proportion of initial trade with the customs union partner and the lower is the proportion of initial trade with the outside world."[7]

Key to this result is the assumption that the customs union causes members to import from more expensive union partners rather than from cheaper outside sources. In order to highlight this terms-of-trade effect, it is useful to rewrite the welfare expression for the single nation, given by equation (1), in a fashion stressing the initial sources of trade. Let, for simplicity, the world consist of only three countries, 1, 2, and 3, in which case the welfare expression of country 1 can be rewritten as,

$$(4) \qquad d\eta^1 = -m^{12}\, dp^e + (p^1 - p^e)\, dm^{12} - m^{13}\, dp^e + (p^1 - p^e)\, dm^{13} \ .$$

Assuming that countries 1 and 2 form a customs union the first term represents the terms-of-trade effect experienced by country 1 on any trade with the partner before joining the union, while the third term represents any terms-of-trade effect on trade with the outside country 3. Either of these effects can come about either by changes in world prices for a given trade pattern or by country 1 changing trading partner. Supposing, as does Lipsey, that the customs union causes country 1 to shift away from importing from low-cost country 3 to importing from high-cost country 2, country 1 experiences a negative terms-of-trade effect of size $m^{13}\, dp^e$, where dp^e equals the cost differential between countries 2 and 3. This effect is smaller the smaller is m^{13} or, for given total volume of trade $m^1 = m^{12} + m^{13}$, the larger is m^{12}, which establishes Lipsey's result.

According to Lloyd (op. cit.) this is contradicted by a later result by Riezman (1979) "that two countries can benefit from a customs union provided that their mutual trade is initially small."[8] Thus suppose that a customs union between countries 1 and 2 causes world prices to change such that country 1 experiences a terms-of-trade improvement on its trade with country 2 of the size $-m^{12}\, dp^e$. This implies, however, that the union partner, country 2, suffers an intra-union terms-of-trade worsening equal to $-m^{21}\, dp^e$. The more these countries trade before forming a customs union, the larger is this loss for country 2, and the less likely it is that volume- of-trade effects and extra-union terms-of-trade effects are sufficiently large to induce

[7] Lipsey (1970).
[8] Riezman (op. cit.), p. 342.

country 2 to join country 1 in a customs union. Thus country 2 will likely block the formation of a customs union involving country 1, and Riezman's result has been shown.

Lloyd's remark notwithstanding, the results by Lipsey and Riezman are mutually consistent. Had Lipsey not assumed a given total volume of trade he would not have needed to allow for a larger volume of initial intra-union trade in order to reduce initial extra-union trade. Indeed, he could have taken the alternative, and direct, route of assuming a small initial extra-union volume of trade, in which case Lipsey's and Riezman's results would combine to an intuitively appealing proposition: A customs union is more likely to be beneficial the closer to autarky are its members.

Perhaps the most fundamental result in the theory of tariffs is that a country that is unable to affect the prices at which it trades internationally should permit the free flow of goods across its borders in order to maximize its gains from international trade. This led Cooper and Massell (1965), Johnson (1965), and Berglas (1979) to argue that a small country gains at least as much welfare from a unilateral tariff reduction as it does from joining a customs union: "If a [preferential] trading arrangement does not affect the terms of trade then it does not allow for any mutually beneficial policy opportunities which are not open to each of the member countries separately."[9] A strong objection was furnished by Wonnacott and Wonnacott (1981), who argued that explicit recognition of the union partner's initial tariffs would establish dominance of a preferential trading arrangement over a unilateral tariff reduction. Berglas (1983) replied that even if foreign tariffs are accounted for, a unilateral reduction of tariffs is at least as beneficial as a customs union if the direction of trade does not change with the formation of the union, and if all countries participate in international trade.

In spite of its intuitive appeal, welfare dominance of the unilateral tariff reduction over the customs union proves to be difficult to sustain, as, I would like to argue, it is based on an imprecise, if indeed not an incorrect, interpretation of what is a small country. Standard tariff theory, which does not consider discriminatory trade policies, defines as a small country one that cannot affect world prices or, equivalently, as a country unable to affect its terms of trade. In the theory of preferential trading arrangements it is no longer the case that a small country cannot affect its own terms of trade. Preferential tariffs create segmentation of markets which allow nations to price discriminate among their (potential) trading partners. A

[9] Berglas (op. cit.), p. 329.

small country must now rather be defined by the criterion that it must take as given the prices offered to it by any of its trading partners.

Consider figure 2, which illustrates a small country, 1, trading two goods with two large countries, 2 and 3. Initial tariffs in the latter countries are such that country 1 can trade with country 2 at p_2^e or with country 3 at p_3^e. With an initial, non-discriminatory tariff, country 1 trades with country 2 to point D. If country 1 unilaterally eliminates its tariff, the point of trade becomes E instead, whereas a preferential trading arrangement permits country 1 to trade at country 2's domestic price, p^2. This implies a terms of trade improvement for country 1 and yet leaves all prices and trading patterns unaffected.[10] If country 2 is assumed instead to be a small country, which is more in the spirit of at least Berglas' reasoning, then it can be represented in country 1's trade space by an offer curve whose elasticity is everywhere finite. As pointed out by Wonnacott and Wonnacott, the customs union issue is now equivalent to the two-country tariff bargaining problem, and each nation prefers bilateral tariff reductions to going to free trade alone.[11] This leaves as the only possible situation where countries have nothing to gain from the coalition partner's tariff elimination, the case where the outside country initially trades every good with the customs union.[12]

World prices constitute, in the standard model of perfect competition, the sole channel through which a country can induce producers and consumers in any other nation to alter their behavior, in particular to change their trade flows. If the formation of a customs union is thought of as a gradual process of tariff reductions, world prices, when the customs union has been completed, need not be any different from what they were before the tariff cuts were initiated to establish that a customs union welfare dominates a unilateral tariff reduction. What is, however, essential for establishing dominance of the preferential trading arrangement over unilateral free trade is that countries' terms of trade change continuously, i.e. are perturbed, as the process unfolds.

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[10] It could be argued that it would be unlikely to observe this customs union since country 2 is indifferent towards its formation. However, the example does illustrate the important point that even at given prices, both ex- and inclusive of tariffs, a small country can experience a terms-of-trade improvement by joining a customs union.

[11] Wonnacott and Wonnacott (1981), pp. 708-9. They discuss also how tariffs in the rest of the world (country 3) imply a range of prices such that countries 1 and 2 would trade exclusively with each other.

[12] Wonnacott and Wonnacott (1984).

IV. Conclusion

By modeling the formation of a customs union as one of multilateral tariff reform, this paper shares with the literature on tariff reform the approach of investigating infinitesimal policy changes relative to initial equilibria with arbitrary tariff rates. The fact that international agreements specify discrete rather than small changes of rates can be addressed either by integrating the changes in welfare over the path of tariff rates implied by the agreement, or by ignoring the path of transition and instead comparing directly the initial situation with the final situation.[13] The advantage of the former approach is that the expressions for small changes makes it possible to calculate optimal values of tariff rates, both for individual nations and for coalitions.[14] It is furthermore a problem for discrete analysis that the trade pattern is not necessarily robust to large changes in tariffs.[15]

The calculus presented in this paper is consistent with the view that governments face restrictions on the size of tariff reductions they can undertake per period.[16] A full general equilibrium model should thus specify adjustment costs as well as a game in which nations bargain over the type of coalition structure to aim for and how to get there.[17] A more complete approach to economic integration should allow also for economies of scale, international factor mobility, and international trade in assets, all of which would be important extensions of the calculus presented in this paper.

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[13] Ohyama (1973) applied the theory of revealed preference to discrete reform and derived sufficient conditions for discrete tax and tariff changes to raise welfare of nations as well as of coalitions.

[14] It is, for example, of considerable interest, and a question that should be addressed by use of expression (3), whether a group of countries is better off by forming a customs union than by establishing a free trade area. As discussed by McMillan and McCann (1981) and by Ethier and Horn (1984), it might not even be optimal for a coalition to establish internal free trade.

[15] Early contributors such as Riezman (op. cit.) and Berglas (op. cit.) assumed that the trade pattern is invariant to the stage of the reform. Appleyard et al. (1989) have recently demonstrated how the trade pattern might change with the formation of a customs union in Dornbusch, Fischer, and Samuelson's continuum-of-goods version of the Ricardian model.

[16] The common reason is a desire to lessen the impact on factors of production that are adversely affected by the elimination of protection.

[17] A series of papers (Riezman (1985), and Kennan and Riezman (1988, 1990)) have investigated international coalition formation in a game-theoretic framework and compare, in discrete fashion, how preferences and endowments affect which types of coalitions are sustainable. By comparison, the criteria in this paper are stated, not in terms of unobservable fundamentals, but in terms of trade volumes, prices, and elasticities of import demand and export supply. Conway et al. (1989) present a continuum-of-goods model where countries are setting optimizing tariffs along paths implied by tariff reform.

It is a remarkable coincidence that the strongest possible critique of this paper was voiced twenty years ago on the occasion of the publication of a dissertation on customs union theory. In his very positive review of Lipsey (1970), Harry Johnson thus remarked: "Hard work, even if devoted to problems subsequently shown to be ill-conceived, instructs the next generation in the important principle that re-defining the problems is easy but resolving them is a very difficult enterprise indeed."[18] We are still far from having a general theory of economic integration. It must be recognized, however, that trade diversion and trade creation were obstacles to its further development.

[18] Johnson (1972), p. 730.

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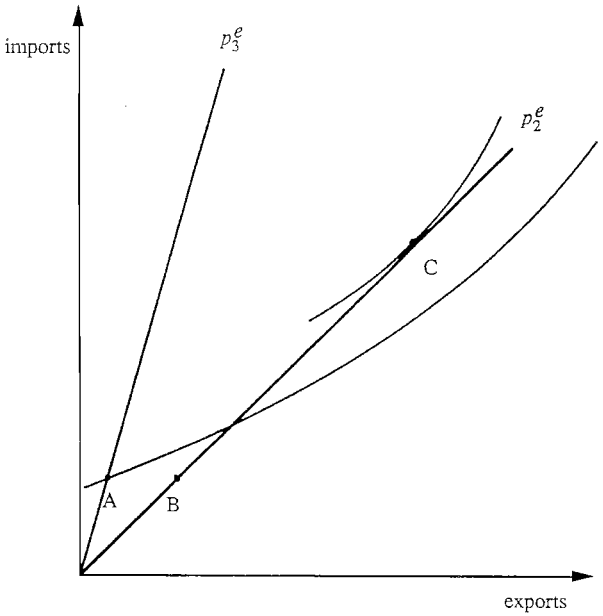

FIGURE 1

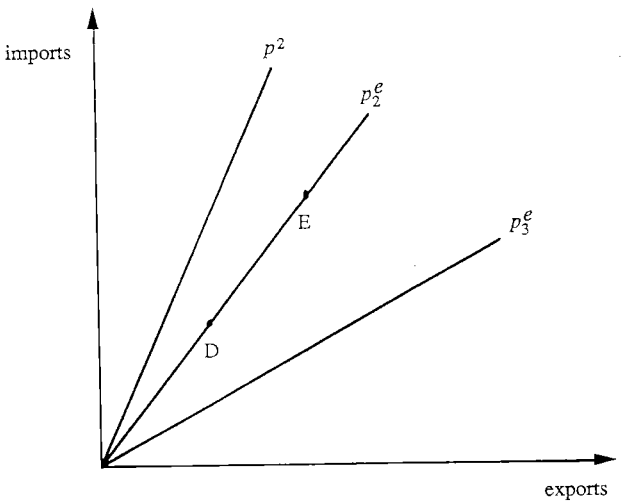

FIGURE 2