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Necessarily welfare-enhancing customs unions with industrialization constraints: The Cooper–Massell–Johnson–Bhagwati conjecture

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Abstract

This paper demonstrates that welfare-improving Customs Unions can be guaranteed even if we are constrained by specific non-economic government objectives, thus proving the Cooper–Massell–Johnson–Bhagwati conjecture. We consider a ‘production’ objective here, where a member country requires the output of a particular sector (e.g. a target level of industrialization) to be maintained at the pre-union level, and show that welfare-improving Customs Unions can still be achieved. It is straightforward to show that this result can be extended to other non-economic objectives as well. © 1997 Elsevier Science B.V.

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1. Introduction

The conventional ‘static,’ ‘benign government’ theory of Customs Unions was pioneered by Jacob Viner’s (1950) pathbreaking work.¹ He essentially argued, counter-intuitively to those who thought that even preferential tariff cuts would necessarily be welfare-improving, that a subset of countries reducing tariffs on one another to zero would not necessarily be improving their own, or world welfare. In short, such Free Trade Areas

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¹The Viner approach is ‘static’ because it concerns only the welfare effects of a once-for-all FTA or CU formation instead of considering ‘time-path’ questions. It is a ‘benign-government’ approach because the formation of the FTA or CU is exogenously specified and the incentives to form them so that they are endogenously determined (as in Krishna (1993)) are not modeled. See Bhagwati (1993) for these analytical distinctions.

or Customs Unions (with common external tariffs) could be trade-diverting and harmful or trade-creating and beneficial.

Although there have been numerous important developments within this analytical framework, including by Lipsey (1957), Lipsey and Lancaster (1956), Johnson (1962) and Meade (1955), interesting developments in new directions have been made in two other contributions:

1. Bhagwati and Brecher (1980) have considered a rather different type of problem: if a Customs Union with internal factor mobility and a common external tariff is already in place, how would parametric and policy changes (e.g. factor accumulation and tariff change, respectively) affect the welfare of individual members countries? This question is clearly of analytical importance for the European Union and indeed for a federal state like the United States, if the regional welfare effects of such changes are at issue.
2. Kemp et al. (1976) who have remained more properly within the Viner–Lipsey type of question, however, have restored the original intuition that any subset of countries could improve their welfare, while not lowering that of others by forming an *appropriate* Customs Union.²

There is an interesting conjecture attributable to Cooper and Massell (1965), Johnson (1965) and Bhagwati (1968) that state that:

*Any subset of countries can always form a welfare-enhancing Customs Union, while ensuring that they still achieve the degree of industrialization that they had achieved through protective tariffs*³

In this short note, we prove the proposition. In doing so, we re-prove the Kemp–Wan proposition by using an optimization framework and then readily extend it, by adapting the Bhagwati and Srinivasan (1969) analysis of non-economic objectives or constraints, to the problem at hand.

2. The Kemp–Wan theorem

As in Kemp et al. (1976), consider a competitive world trading system with any number of countries and with no restrictions whatever on the initial tariffs of individual countries. Let any subset of countries form a Customs Union. To see how aggregate gains for the member countries can be achieved, we use the familiar Samuelson (1956) social indifference curves, which enable us to write a well-behaved social utility function.

²In doing so, they solved for the common external tariff, therefore using it as an endogenously-determined policy variable, unlike in the Viner–Lipsey approach.

³For instance, Cooper and Massell (1965) ask, “Why should a country be willing to give up its sheltered industries for the partial benefits of a Customs Union?” and “Is there a tariff that would make both countries (in a CU) better off relative to optimal policies of non preferential tariff protection?” and Bhagwati (1968) states that “If LDCs could be allowed to reduce tariff barriers among themselves, this could permit the given trade diversion (implicit in each LDC’s decision to industrialize) to be carried out at a lower cost”.

We allow for the use of lump sum transfers between individuals in the member countries.⁴ This allows us to neglect distributional issues between the member countries and to assert that, as we move up to higher social indifference curves, Pareto-superior outcomes can be achieved. The formulation of the problem closely parallels that of Bhagwati and Srinivasan (1969). Let $i = 1 \dots n$, index goods and $j = 1 \dots m$, index member countries.

Let the net import vector of the member countries from the rest of the world be denoted as

$$I = (I_1 \dots I_n).$$

where, I_i would be positive if the i th good was a net import from the rest of the world and negative if it was a net export. Using the Kemp–Wan strategy, we freeze the net import vector of the union at the pre-union level and maximize the social utility function,

$$U = U(C_1 \dots C_n) \tag{1}$$

subject to:

$$C_i = \sum_j X_i^j(L_i^j, K_i^j) + I_i \quad \forall i \tag{2}$$

$$\sum_i L_i^j = L^j \quad \forall j \tag{3}$$

$$\sum_i K_i^j = K_j \quad \forall j \tag{4}$$

$$I_i = I_i^F \quad \forall i \tag{5}$$

where C_i stands for the aggregate availability of good i in the union, X_i^j stands for production in country j of good i using a factor combination of L_i^j and K_i^j , respectively. L^j and K^j denote the total availability of these factors in country j . Although we only choose two factors of production, it will become clear that the results generalize to any number of factors. Note that the vector, $I^F = I = (I_1 \dots I_n)$, is the pre-union net import vector and is fixed throughout the analysis. The maximization problem above simply recasts the Kemp et al. (1976) problem⁵ in welfare maximization terms. We can normalize the pre-union foreign prices of all goods to unity. It is important to note that we are not assuming a fixed foreign price vector. Since, as in Kemp et al. (1976), we freeze the net import vector at the pre-union level, trade at the same foreign prices will obtain after the union is formed and the welfare of the rest of the world is not reduced. Eq. (3) and Eq. (4) are the resource constraints. Eq. (5) fixes imports at the pre-union level.

⁴Lump sum transfers to ensure Pareto superior outcomes are also used in the original Kemp–Wan framework. For an illuminating discussion of how such compensation schemes can be constructed, see Grinols (1981).

⁵Kemp et al. (1976) are not explicit about their need for a complete indexation of goods and factor endowments by their location. However, on closer examination, it is clear that their proof fixes the trade vector of each country to arrive at a welfare-improving customs union. The framework that is used in this paper relaxes the Kemp–Wan import constraint by only requiring that the pre-union net import vector be fixed for the union as a whole. By allowing for further substitution in production and consumption within the union, we can therefore achieve even greater levels of welfare than are possible under the corresponding Kemp–Wan construction.

To solve this problem, we now form the Lagrangean:

$$= U - (\sum_i \lambda_i [C_i - (\sum_j X_i^j (L_i^j, K_i^j)) + I_i]) - (\sum_j \omega_j [\sum_i L_i^j - L^j]) - (\sum_j \rho_j [\sum_i K_i^j - K^j]) - (\sum_i \eta_i (I_i - I_i^F))$$

Maximization of the Lagrangean subject to the import vector constraint yields the necessary conditions for a constrained optimum. These are:

$$U_i = \lambda_i \quad \forall i \tag{6}$$

$$\lambda_i = \eta_i \quad \forall i \tag{7}$$

$$\lambda_i X_{i1}^j = \omega_j \text{ or } L_i^j = 0 \quad \forall i, j \tag{8}$$

$$\lambda_i X_{i2}^j = \rho_j \text{ or } K_i^j = 0 \quad \forall i, j \tag{9}$$

Eq. (6) along with Eqs. (8) and (9) implies that for an interior solution, the marginal rate of substitution between any two goods, say good 1 and good 2, in consumption as well as production is the same value, λ_1/λ_2 . Also, from Eq. (6), we know that $\lambda_i > 0, \forall i$. We could conveniently choose $\lambda_1 = 1$. Finally, from Eq. (7), we then know that,

$$1 = \eta_1$$

implying that

$$\lambda_i/\lambda_1 = \eta_i \quad \forall i$$

that is, that the marginal rate of substitution in consumption as well as production is different from the foreign price ratio. For instance, the marginal rate of substitution in consumption as well as production between goods i and 1 is $\lambda_i/\lambda_1 = \eta_i$, whereas the foreign price ratio is simply 1 (by construction). This implies a tariff imposed against the rest of the world on imports of good i . Note that at an optimum all other first-order conditions are to be met. In other words, given the import constraint, the second-best optimum is obtained by the use of suitable tariffs on imports from the rest of the world and with all other Paretian conditions being met. Since the optimal way to achieve the net import vector ' I_1^F ' is as is described above, we can obviously conclude that any other way of achieving ' I_1^F ' can be (weakly) improved upon. Since ' I ' was actually achieved before the union, the pre-union situation can be (weakly) improved upon by the removal of all intra-union tariffs and by the use of a common external tariff (as is implied by the solution to the maximization problem above). This is simply the Kemp et al. (1976) result.⁶

⁶The original proof of the theorem considers a fictitious economy composed of member countries but with a net endowment equal to the sum of the member countries' endowment plus the equilibrium preunion net excess supply of the rest of the world. The economy then possesses an optimum and any optimum can be supported by at least one internal price vector. If the pre-union equilibrium of the member countries is a Pareto-optimal equilibrium of the fictitious economy or it is not, in the latter case, a preferred Pareto-optimal equilibrium can be attained by means of lump sum transfers among individuals of the fictitious economy. It must also be mentioned that the framework used in this paper is less general than the Kemp–Wan framework which, inter alia, allows for heterogenous preferences across consumers and for transport cost considerations.

2.1. *The Cooper–Massell–Johnson–Bhagwati conjecture*

We now take a non-economic production objective into account. Thus, for instance, let us assume that each country j within the union wants the level of its production of good i to be maintained at the pre-union level. This would imply additional constraints in the maximization exercise of the type,

$$X_i^j = X_i^{j\sim} \quad \forall j \tag{10}$$

where $X_i^{j\sim}$ is the pre-union level of production of good i in country J .

The inclusion of this additional constraint alters the first-order conditions corresponding to L_i^j and K_i^j . The new first-order conditions are,

$$(\lambda_i + \delta)X_{i1}^j = \omega_j \quad \forall j \tag{8a}$$

and

$$(\lambda_i + \delta)X_{i2}^j = \rho_j \quad \forall j. \tag{9a}$$

From Eqs. (8a) and (9a), the marginal rates of substitution in production between good i and all the other goods are different from the corresponding marginal rates of substitution in consumption between good i and the other goods, implying that a production tax-cum-subsidy policy in each country is optimal. Also, from Eq. (8a) and Eq. (9a), the marginal rate of substitution between L and K is the same in the production of the good i as it is in the production of all other goods. Thus, there is no factor subsidy involved (except in the trivial sense of an equi-proportionate subsidy on L and K used in the production of good i , which, after all, is equivalent to a production subsidy on good i). Importantly, all other Paretian conditions should still be met for a constrained optimum, implying that the intra-union tariffs should be kept at zero. Any other way of achieving $X_i^j = X_i^{j\sim}$ can be (weakly) improved upon. Since $X_i^j = X_i^{j\sim}$ was actually achieved before the union, the pre-union situation can be (weakly) improved upon and a (weakly) Pareto-superior outcome can be achieved.

Equally, it follows that the feasible welfare level of this union would be even greater if the constraint $X_i^j = X_i^{j\sim} \forall j$ was weakened and rewritten as

$$\sum_j X_i^j = \sum_j X_i^{j\sim},$$

so that the constraint is only an aggregate union-wide constraint (as originally in Cooper and Massell (1965)).

This result can also be readily extended to other ‘non-economic’ constraints. A welfare-enhancing Customs Union which does not harm or benefit non-members can be formed even if each member requires, for instance, that its manufacturing employment not fall. The ‘supporting policy,’ complementing the common external tariff, then will be an employment-tax-cum subsidy (exactly as in Bhagwati and Srinivasan (1969)).

3. **Conclusions**

This paper demonstrates that welfare-improving Customs Unions can be guaranteed even if we are constrained by specific non-economic government objectives. We have considered a ‘production’ objective here, but it is straightforward to show that this result can be extended to other non-economic objectives as well. As we would expect from the

insights of both the Kemp–Wan theorem and the theory of non-economic objectives, the necessarily welfare improving Cooper–Massell–Johnson–Bhagwati union requires both an appropriate common tariff and an appropriate domestic tax-cum- subsidy addressed to the non-economic objective desired.

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Note added in proof

Using a technique very similar to the one adopted in this paper and following the unified intuition regarding second best problems developed in Krishna and Panagariya (1996) – that removal of some pre-existing distortions, if all remaining distortions are quantitative ones, is always (weakly) welfare improving, Krishna and Panagariya (1997) show that we can also always construct necessarily welfare improving *free trade areas* (in contrast to the necessarily welfare improving *customs unions* that the Kemp–Wan theorem delivers instead).

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