

ON TRANSFER PARADOXES AND IMMISERIZING GROWTH:

Part I*

Comment

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1. Introduction

Our *Comment* is addressed to (i) noting very briefly certain errors in the formally-stated Theorems and analytical assertions in Chichilnisky's (1980, 1981) two papers in this *Journal* on Transfers and on Growth respectively, and (ii) correcting a few of her interpretations of the literature on these problems.

We concentrate on the two paradoxical phenomena which she focuses on, i.e., the possibility of immiserizing a transfer-recipient (as also of enriching the transfer-donor) and the possibility of immiserizing growth. These phenomena are well known in the field of international trade. They are also of importance to policy-makers since prescriptions concerning redistribution (whether national or international) and the effects of growth are based on intuitions that may need *caveats*.

Part I of our *Comment* deals with Chichilnisky (1980) and Part II with Chichilnisky (1981). The immiserizing growth and transfer paradoxes do have a basic symmetry in the theory of distortions. However, we ignore this important insight and refer the reader instead to Bhagwati, Brecher and Hatta (1982a, b, c).¹

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¹For an earlier, unified *Comment* which dealt with both papers, see Srinivasan and Bhagwati (1982). The *Comment* has been split into two Parts at the instance of the Editor, and some points added concerning literature on Transfer Paradoxes. The full algebraic analysis of the problems presented in an appendix has been omitted. It is, however, available from the authors.

2. Immiserization of the recipient: The invalid Theorem 1

In Chichilnisky (1980), a simple 3-agent exchange model with fixed consumption coefficients is used. This model, characterized by fixed coefficients everywhere in production and consumption, is identical to that underlying the analysis of Gale (1974), whose work is cited in Chichilnisky (1980, fn. 10).

Chichilnisky calls hers a North-South model, with the North differentiated into Rich and Poor groups, and the South kept homogeneous. She endowed each group with fixed quantities of 2 goods, A and B , and with fixed consumption coefficients. Besides, the South spends a larger proportion of income than the Poor on B goods whereas the latter, in turn, spend a greater proportion on B goods than their Rich compatriots. With the Rich transferring A goods to the South, the following theorem is stated (1980, p. 150):

Theorem 1. Assume that the endowments of the South are small, consisting mostly of basic goods B and that conditions (C.1) and (C.2) are satisfied.

Then a transfer of the luxury or investment good A from the resources of the high income group in the North to the South will necessarily decrease the welfare of the South and increase the welfare of the North, in a (Walrasian) stable market...²

Unfortunately, this cannot be correct: and the error is immediately evident. Thus take fig. 1, where the South is represented. Let E_1 be the endowment. Then, p_1 is the initial price ratio, C_1 the consumption point so that South exports B goods and U^s the social welfare for (homogeneous) South. Fixed coefficients in consumption are assumed. Let South now receive A goods of amount $E_1 E_2$. Now, as in standard Samuelsonian 2-state argumentation, we can deduce a rise in excess demand for B goods in the world markets as a result of the transfer, at constant terms of trade, if the Rich spend a lower proportion of income on B goods than South does, as assumed by the author (1980, p. 509). Given Walrasian market stability, therefore, the relative price of B goods *must* rise: p_1 yields to p_2 . Under these assumptions, which are totally consistent with the stated assumptions of Chichilnisky prior to, and including in Theorem 1 (paragraph 2), we have welfare *improvement* for the South; and hence the assertion that the transfer will necessarily decrease the welfare of the South under the stated assumptions is evidently invalid. It is equally evident that we could show immiserization by assuming in fig. 1 that the South was exporting A goods rather than B goods: such that C_1 was replaced in fig. 1 by C'_1 (and a suitable shift in p_2).

²Conditions (C.1) and (C.2) ensure that an equilibrium exists with a positive price for basic goods and that equilibrium prices vary continuously with the parameters of the model.

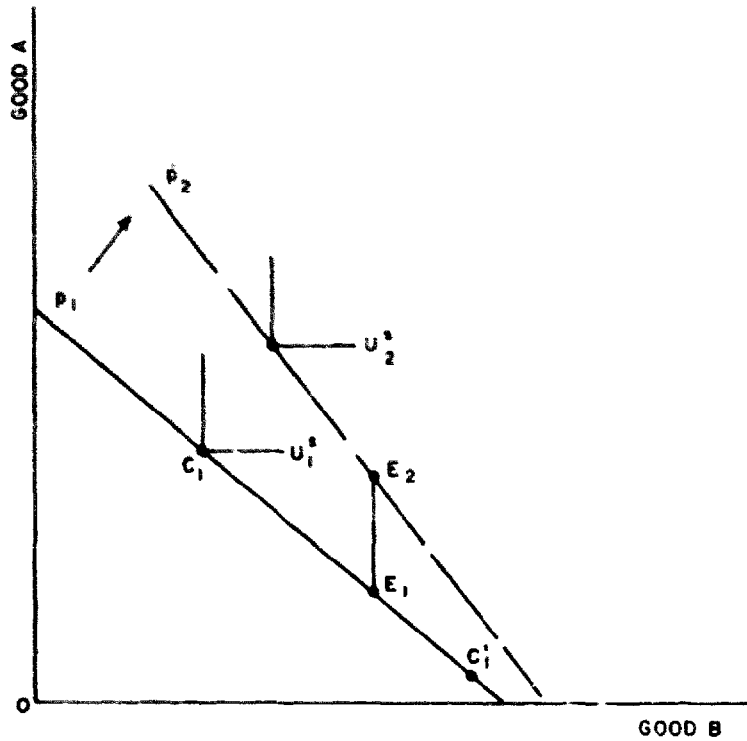


Fig. 1

It is not difficult to trace the source of Chichilnisky's error. In 'proving' the theorem she *assumes* (even though the statement of Theorem 1 does not include this assumption) that λ , the difference in the endowments L_A of A and L_B of B goods of the Northern Poor, is negative. To the reader who may wonder whether it is meaningful to talk of the difference in endowments of two goods, the unit of measurement of each of which is arbitrary, it should be pointed out that the two goods (measured in some specified units) are consumed by the Northern Poor in the fixed ratio 1:1. It is this feature that makes meaningful the difference in endowments of the two goods (in the units specified). She also notes (1980, p. 513, fn. 9) that with $\lambda < 0$ the existence of the relevant equilibrium requires that σ , the difference between cS_A and S_B , is *positive* where (S_A, S_B) are respectively the endowments of the South of A and B goods, and the South consumes A and B in the ratio 1: c . Thus, measured in the only meaningful way (i.e., by making the units of A and B commensurable for the South by using *its* ratio of the two goods in consumption) South's endowment has to favour A goods (i.e., $cS_A > S_B$) rather than B goods for the existence of the relevant equilibrium under the assumption $\lambda < 0$. Thus South's endowment cannot consist 'mostly of basic goods' in a meaningful sense. Unfortunately Chichilnisky failed to note that the *unstated* assumption $\lambda < 0$ required for a valid Theorem 1 precludes the *stated* assumption, that the South's endowment consists mostly of basic

goods, from holding! It is also the case that $\sigma > 0$, i.e., $cS_A > S_B$, implies that the South will be *exporting luxury goods* in equilibrium!

3. Why these paradoxes?

The reader may have jumped to the conclusion from Theorem 1, and its condition that the South's endowment consists 'mainly of basic goods' (which has an air of empirical relevance) that the South is likely, if not certain, to be immiserized by receipt of aid as specified. Now that we have shown that this condition must be *replaced* by a condition which implies that the South exports *luxury goods* (which are typically imported instead) in equilibrium the reader may well be forgiven for jumping to the opposite conclusion that the South's immiserization is impossible or improbable in reality! Both inferences would be hasty. In short, we need more intuition to understand the transfer paradoxes. The reader will find such intuition in Brecher and Bhagwati (1981), Bhagwati, Brecher and Hatta (1982a), and Yano (1981). We simply note the following here.

Why is it possible to show the transfer problem paradoxes in a 3-agent model even though, in the 2-agent Leontief (1936)–Samuelson (1947, 1952) analysis, we know that Walrasian instability is required for them? While there are alternative ways to 'explain' and provide intuition for this, we will utilise the following, somewhat heuristic argument [which, conducted rigorously, leads to the formulae in Brecher and Bhagwati (1981)]. Thus, recall the 2-country Samuelson–Mundell (1960) criterion for the welfare impact on the transferee. This is (assuming that the marginal utility of income is unity at the pretransfer equilibrium by choice of units):

$$\frac{dU^{II}}{dT} = 1 - \frac{m^I + m^{II} - 1}{\varepsilon^I + \varepsilon^{II} - 1} = \frac{\varepsilon^I + \varepsilon^{II}}{\varepsilon^I + \varepsilon^{II} - 1}, \quad (1)$$

where the transferor is country I, the transferee is country II; m^I and m^{II} are the marginal propensities to spend on importables (in a 2-good setting); ε^I and ε^{II} are the compensated offer curve elasticities; and ε^I and ε^{II} are the offer curve elasticities. Since ε^I and ε^{II} are definitely signed under usual assumptions, $dU^{II}/dT > 0$ if $\varepsilon^I + \varepsilon^{II} > 1$, i.e., if market stability is assumed. The transferee *cannot* be immiserized. Nor, symmetrically, can the donor be enriched. When, however, an 'outside' country or agent is assumed, say country III, which neither makes nor receives the transfer, then the formula must clearly be modified to accommodate. The income terms in the numerator will now belong only to the transferor I and the transferee II, whereas the offer curve elasticity ε^{II} must now be a weighted sum of the offer curve elasticities of country II and III. Therefore dU^{II}/dT will no longer show now simply the compensated elasticity terms in the numerator, and the

immiserization of country II can arise even though Walrasian stability obtains. So can enrichment of the donor country I be shown as a possibility.

4. The literature on transfer paradoxes in the 3-agent model

There are two independent pioneering efforts on transfer paradoxes in the many-agent case. First, Gale (1974) showed, with an example that used fixed coefficients in consumption and in production (since he assumed an exchange model), that a donor could be enriched by a transfer in a 3-agent case. This immediately established, of course, that the recipient could be immiserized as well: for an identical reverse transfer by the recipient to the donor will immiserize the latter, now the recipient, in his example. Moreover, simple calculation readily shows that the Gale example is Walras-stable. The important question left open, and remarked on by Gale himself, is whether such paradoxes are compatible with substitution in consumption (and, for that matter, in production); and, more importantly, whether substitution effects can dampen or amplify the probability of such paradoxes arising.

Second, the other paper written independently of Gale in the many-agent problem is by Brecher and Bhagwati (1981a). They utilised the orthodox trade-theoretic model where substitution is present and also explicitly investigated Walras-stability. Their results (1981a, pp. 502-505), while focussing on the immiserization of the recipient, imply the possibility of the paradox of donor enrichment and indeed of both simultaneously.

Gale's (1974) work has itself led to other interesting contributions. Two are of central importance. Yano (1981), citing Gale, has developed an elegant analysis of the role of substitution and income effects in a trade-theoretic model, as Brecher and Bhagwati (1981) had earlier but independently thereof. The conditions for the transfer paradoxes to arise in Gale's model can be derived readily and quite generally from this analysis by setting the substitution terms equal to zero. Guesnerie and Laffont (1978) have established an interesting (Impossibility) Theorem in a very general analysis of the Gale-established transfer paradoxes.³

³For a full analysis of the considerable literature on transfer problem paradoxes, see Bhagwati, Brecher and Hatta (1982c).

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