

## A REJOINDER\*

T.N. SRINIVASAN

*Yale University, New Haven, CT 06520, USA*

Jagdish N. BHAGWATI

*Columbia University, New York, NY 10027, USA*

Received November 1983

We wholly agree with the *Rejoinders* by Gunning and Findlay in this issue to the new piece by Chichilnisky. However, some remarks are in order.

First, we must re-emphasise with others that the attempt at defense based on the assertion that we build our critique on 'an adjustment process proposed first by Findlay — which is quite different from that in Chichilnisky (1981)' [Chichilnisky (1984, sect. 3, below Proposition 10)] is simply unsustainable. Her original article (p. 171) asserted: 'It should be noted that the results of this paper are obtained at *equilibria* of the model. Therefore they are *independent* of the adjustment process followed to attain equilibrium (our italics).' Like her, we compared equilibria and found her in error.

Second, it cannot be emphasized enough that Chichilnisky appears to be confused about shifts in curves and shifts along a curve. A rightward shift in the  $I^D(N)$  curve will imply a simultaneous, opposite shift in the consumption good demand curve. Both are, of course, compatible with the final equilibrium showing the quantity traded of the consumption good to be rising, instead of falling. In fact, the correctness of our argument can be easily established using the so-called resolving eq. (24) and eq. (26) in Chichilnisky (1984). Writing  $x$  for  $p_B$ , eq. (24) is of the form

$$\lambda x^2 + \mu x + \theta = 0, \quad \lambda > 0, \quad \mu > 0, \quad \theta < 0. \quad (1)$$

The signs of  $\lambda$  and  $\theta$  being opposite implies that both roots are real and only one of them is *positive*. The positive root is the equilibrium  $p_B^*$ .<sup>1</sup> Now  $\mu$  is an

\*Thanks are due to Ronald Findlay for helpful conversations.

<sup>1</sup>Since the constant and second order terms of her resolving quadratic equation are *strictly* of opposite sign, both roots are real, non-zero and only one of them is strictly positive. Thus, there is a unique (rather than at most one) strictly positive root  $p_B^*$ . Incidentally, this shows that Chichilnisky (1981, pp. 168–169) was wrong in asserting that 'In general there will be two equilibria for each region for each value of  $I^D$  because the solutions describe a polynomial of degree two'.

increasing linear function of  $I^D(S) + I^D(N)$  while  $\lambda$  and  $\theta$  do not depend on it. It can be easily verified that the positive root  $p_B^*$  (i.e., the equilibrium relative price of basics) increases as  $I^D(N)$  [and hence total world demand  $I^D(S) + I^D(N)$ ] decreases. Thus our inference from our fig. 2 is identical to that from Chichilnisky's resolving eq. (24). Her contention that we erred is therefore incorrect.

Chichilnisky points out that one could have parametrized the model by the equilibrium level of exports  $X_B^S(S) [= X_B^D(N)]$  of basics from the South and it leads to her resolving eq. (26),  $p_B^2(A - X_B^D(N)) + (C + I^D(S)) - V = 0$ . Again, as long as  $X_B^D(N)$  does not exceed  $A$ , the constant and second order terms of (26) are of opposite sign, leading to the conclusion that there exists a unique positive root  $p_B^*$ . While this is not the same as shifting  $I^D(N)$ , it is fairly easy to see that as  $X_B^D(N)$  increases, the positive root  $p_B^*$  of (26) increases as well. This once again is the orthodox conclusion that an exogenous increase in the North's demand for the exports of the South improves the South's terms of trade.

Third, that equilibrium in this model is unique and Walras-stable in the traditional sense (and this fact is simply reinforced by the Rybczynski effects in her highly-simplified variable-factor-supply special case of the well-known Kemp-Jones analysis), is presented by her as if this is a concession made by ourselves, Findlay, and others, when, in fact, we among others drew attention to it ourselves to underline the errors of her assertions!

Fourth, she continues to talk about 'export-led' policies being analyzed by her. This is confused and confusing. The comparative-statics in her analysis refers to the effects of a shift in North's demand for  $I$ -good (now rechristened, in the Chichilnisky response, as industrial goods when they were investment goods in the original paper). But 'export-led' growth strategy often refers to a trade strategy where the South's own policy shifts from import-substitution to export-promotion policies. On the latter question, the Chichilnisky analysis, even if corrected for the errors, would throw no light.

Finally, we should note that our comments are based on the final draft of the Chichilnisky Response, as sent to us by the Editor with the communication that a Rejoinder by us would be allowed. This caveat is necessary simply because of the extraordinary situation that has resulted from changes which were introduced, unknown to ourselves and Gunning, in her Response to our Comments on Chichilnisky's (1980) paper on the man-agent transfer problem, after our Rejoinders to that Response were accepted: all published in the August/October 1983 issue of this journal. In the changed version that finally appeared in print Chichilnisky has renumbered footnotes, deleted arguments (e.g., that the omission of a condition was a 'typo') and introduced some new errors (e.g., in the newly-numbered footnotes 6 and 12). In the nature of the case, none of the errors noted by us

(1983) in the original (1980) Chichilnisky paper is salvaged by these procedures.

### **References**

- Chichilnisky, G., 1981, Terms of trade and domestic distribution: Export-led growth with abundant labour, *Journal of Development Economics* 8, April, 163-192.
- Chichilnisky, G., 1984, North-South trade and export-led policies, *Journal of Development Economics*, this issue.
- Srinivasan, T.N. and J. Bhagwati, 1983, On transfer paradoxes and immiserizing growth: Part I, *Journal of Development Economics* 13, Aug.-Oct., 217-222.
- Srinivasan, T.N. and J. Bhagwati, 1984, On transfer paradoxes and immiserizing growth: Part II, *Journal of Development Economics*, this issue.