MUNDELL AND KOJIMA ON TRADE AND CAPITAL MOVEMENTS

By NOBUO MINABE*

I

Robert Mundell[1] has shown that under certain conditions the capital movement induced by tariffs on goods will substitute for trade and enable the tariff-impeded international economy to reach essentially the same equilibrium as would a completely free international economy. Kiyoshi Kojima criticizes Mundell in his rejoinder stating that since Mundell introduced an incentive for capital movement such as tariffs, either he could not show the "complete substitute or indifference" unless the tariffs are eliminated or he had to show the effects of capital movement with the tariffs which, however, must differ from the results of free trade.[2] On the other hand, Ekkehard Bechler[3] in this *Journal* supports Mundell's proposition by showing how to reach the new equilibrium after capital moves though I presented among others the same argument in *A.E.R.* three years ago.[4] Mundell did not show the process to reach the new equilibrium. This process seems to be very important because only a limited amount of capital is often allowed to move internationally.[5] Kojima's argument which follows Hirofumi Uzawa's[6] is also related to the process. As well known, Uzawa (and also Kojima in his rejoinder) argued that capital movements induced by tariffs on goods had to diminish the recipient country's welfare. But Uzawa's (and Kojima's) argument is true only when the amount of capital inflow is small sufficiently. I will show here that when the amount of capital inflow induced by tariffs is large sufficiently, the recipient country's real income will be increased if a completely free capital

* Professor (*Kyōju*) of Economics, Osaka City University.

[1] R.A. Mundell, "International Trade and Factor Mobility", *American Economic Review*, June 1957, pp. 321–35.

[2] K.Kojima, "International Trade and Foreign Investment: Substitutes or Complements", *Hitotsubashi Journal of Economics*, June 1975, pp. 1–12.

K.Kojima, "A Rejoinder on International Trade and Capital Movements", *Hitotsubashi Journal of Economics*, June 1977, pp. 31–34.

[3] E.Bechler, "International Trade and Capital Movements: A Re-examination", *Hitotsubashi Journal of Economics*, June 1977, pp. 25–30.

[4] N.Minabe, "Capital and Technology Movements and Economic Welfare," *American Economic Review*, Dec. 1974, pp. 1088–1100.

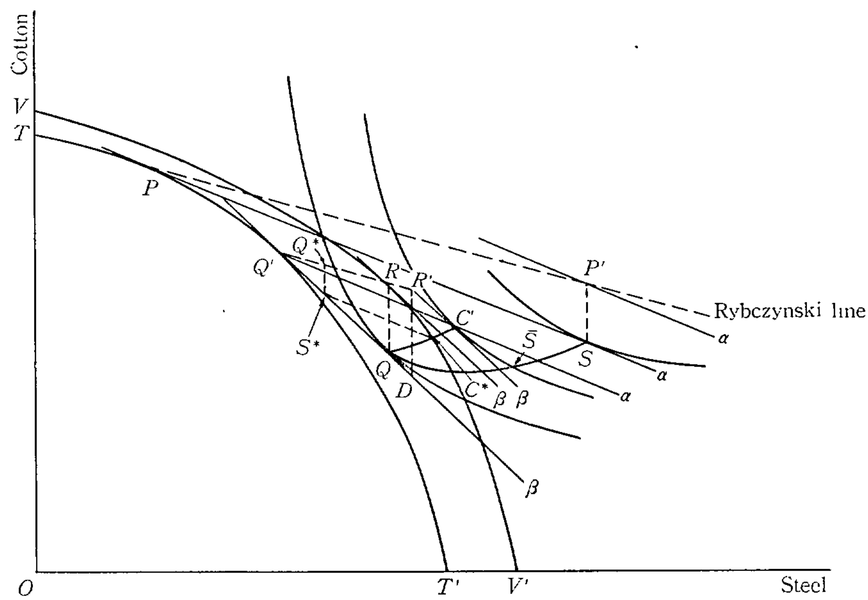
[5] In his rejoinder Kojima argued "Minabe insists that capital moves until its rewards are equalized between the two countries." This is Mundell's assumption. If Kojima wants to criticize Mundell, he must use the same assumptions as Mundell's. In my case I pointed out also "Liberalization of capital movements often is incomplete, and if so the capital inflow may decrease the recipient country's real income". I hope Kojima reads my papers more carefully before he criticizes me. N. Minabe, "Foreign Investment and Foreign Trade: A Comment on Prof. K.Kojima's Criticism on R.A. Mundell," *Keizaigaku Zassi*, Osaka City University, Aug. 1976, p. 10 (in Japanese).

[6] H.Uzawa, " Liberalization of Foreign Investments and National Economy," *Ekomonisuto*, Dec. 1969, 23rd, pp. 106–122 (in Japanese).

movement is not allowed so that capital rewards still are not equalized between the two countries.

Let us begin with a situation where factors are immobile internationally but where impediments to trade are absent. The country exports its labor intensive product, cotton, in exchange for steel. Equilibrium is represented in Figure 1: TT' is the transformation

FIG. 1



curve, production is at P and consumption is at S when the terms of trade is represented by the slope of α. When the country levies an import tariff on steel, the domestic commodity price ratio changes from α to β. The production point moves from P to Q', while the consumption point moves from S to C' at which the indifference curve has a slope of β and the line $Q'C'$ has a slope of α. When capital is sent from abroad to the host country, production moves on the Rybczynski line $Q'R$ from Q' to Q^*. By paying the profit equal to the marginal productivity of capital Q^*S^*, the consumption point moves to C^*. C^* must lie on the Engel curve $C'Q$ through C'. The host country's welfare level is lower at C^* than C'. That is, the real income falls by capital movements. This is the same as Uzawa and Kojima's equilibrium situation. The same thing is true if capital moves in more until the host country's production point comes to R along the Rybczynski line and the corresponding consumption point Q along the Engel curve through C', at which RQ is paid to foreign capital owners as the repatriation of dividends.

But Uzawa and Kojima's proposition does not hold any more if foreign owners send their capital to the host country more than this amount. Suppose capital is moved in more than this amount so that the production point moves to R' along the Rybczynski line. After the repatriation payments of dividends $R'D$, the domestic price of steel falls below the import price plus the tariff at D (because the demand price of steel is now determined by the slope of the indifference curve at D). The market price of steel tends to fall so that the production point will move upwards along the transformation curve through R' on one hand, and trade ceases on the other. Now, the (non-prohibitive) tariff becomes prohibitive and trade ceases, but capital will still continue to move in so long as the domestic price of steel is higher than the foreign price, because the profit is still higher in the host country than abroad.[7] Since there is no trade and the link between the foreign price and the domestic price is broken, the price of steel tends to fall, and the profit begins to be depressed. The domestic price of steel falls so that capital inflow does not move production on the given Rybczynski line through Q'. Payments to foreign capital depress welfare less and less, and we can draw the locus of consumption points $Q\bar{S}S$. When capital moves large sufficiently in the amount so that consumption moves above $\bar{S}$ at which the consumption locus $Q\bar{S}S$ intersects the indifference curve through C', foreign capital will begin to improve the host country's real income. Notice that the profit rate in the host country still is just as unequal after capital moves as before. Of course, if capital is not allowed to move in more, this situation will be an equilibrium with unequal rates of profit between countries. But if a completely free capital movement is allowed (by the government), capital will flow in until its marginal product is equalized in the host and the foreign countries, which will be at the point where the host country can produce enough steel and cotton for consumption equilibrium at S without trade, and at the same time make the required interest payment abroad. This point is clearly reached at P' directly above S, which is the same situation as reached in the case of prohibitive tariff. At P' demand conditions in the host country are satisfied and the interest payment can be made abroad at the same price ratio as before the tariff was levied. It should be emphasized that this situation is not temporary and also not the result of the improvement in productivity and economies of scale in steel production in the host country due to appropriate inflow of direct investment. We obtain our result under the assumptions that the steel industry is subject to constant returns to scale and no technological change occurs by the capital movement. Contrary to Kojima's argument it seems quite interesting to me that even if we assume constant returns to scale and no technological changes, the non-prohibitive tariff finally eliminates trade, and after capital moves there is no longer need for trade. The tariff is *not* eliminated as Kojima writes, but it still remains! But, since the marginal costs of production and prices are equalized the tariff is completely inoperative and can be removed.

Kojima criticized the author "Minabe insists that capital moves until its rewards are equalized between the two countries. But take another example of distortion due to distance and transportation costs, instead of tariffs. If transportation costs are expensive the capital movement is stimulated but the transportation costs never become ineffective. The story may be the same for tariffs". We have never thought like Kojima's. It may be enough to mention Mundell's statement that the introduction of transportation costs would reduce world income even if capital were perfectly mobile unless capitalists are willing to

[7] This is what Mundell says that in fact even the smallest tariff is prohibitive in this model, and a small tariff would not prohibit trade immediately: because of the price change some capital would move in and some trade would take place. But Mundell is misleading when he continues to say that as long as trade continues there must be a difference in prices in A and B equal to the *ad valorem* rate of tariff—hence a difference in marginal products—so capital imports must continue, and marginal products and prices can only be equalized in A and B when A's imports cease. (Mundell, *ibid.*, p. 325) As proved in this paper the marginal products and prices still may not be equalized in A and B countries when A's imports cease.

consume their income in the country in which their capital is invested.[8] As Kojima stated the transportation costs never become ineffective. But tariffs become ineffective because the marginal costs of production and prices are equalized in the host and the foreign countries so that imports cease if a completely free capital movement is allowed. Kojima's simile is misleading.

II

In the Mundellian case the production function of each industry is assumed to be the same in the two countries. In this case the import tariff induces owners of capital to send it to the home country (which has imposed the tariff) if and only if the home country is an importer of the capital-intensive good. Conversely, if the home country is an importer of the labor-intensive good, owners of capital in that country will send it to the foreign country. According to the Heckscher-Ohlin theory of trade patterns, an importer of the capital-intensive good is considered a capital-scarce country. Therefore, if foreign owners of capital send it to this country, I defined it as the Heckscher-Ohlin pattern of capital movements because a capital-scarce country imports capital. As stated already, capital inflow results in an expansion of the industry of importables (and a deterioration of the exportable industry), which, in turn, displaces trade.[9] This type of capital movement may correspond to Kojima's "anti-trade-oriented foreign direct investment" or "the American type of foreign direct investment".[10]

These are not all the cases. For instance, suppose Hicksian neutral technological progress occurs in the capital-intensive good industry (which may occur as the result of capital movement). Then the returns to capital will rise on one hand, and the relative price of the capital-intensive good will fall on the other. The country which has technological progress in the capital-intensive good industry may have a comparative advantage in the capital-intensive good, but nonetheless the country may be a capital importer. That is, a capital-abundant country which exports the capital-intensive good imports capital! I called it the Leontief paradox type of capital movements. In this case capital inflow results in an expansion of the industry of exportables, which does not displace trade and the home welfare never be deteriorated by capital movements if the amount of capital movement is small sufficiently.[11] This type of capital movement may correspond to Kojima's "trade-oriented foreign direct investment" or "the Japanese type of foreign direct investment".[12]

Kojima's main proposition of the foreign investment policy is that foreign direct investment should not be "anti-trade oriented". There is no sound reason under a free market mechanism to do foreign direct investment so as create competitive production abroad against its exportables. Therefore, "we have to pay much attention to whether a foreign direct investment is undertaken in a pro-comparative disadvantage industry which is trade-creating,

[8] R.A. Mundell, *ibid.*, p. 332.
[9] N. Minabe, the paper in *A.E.R.* (1974), p. 1090.
[10] K. Kojima, The paper in *this Journal* (1975), p. 4.
[11] See my article in *A.E.R.* (1974), pp. 1091–1094.
[12] K. Kojima, ibid., *this Journal* (1975), pp. 8–9.

or in a pro-comparative advantage industry which results in a trade destruction".[13]

Kojima's proposition cited above is misleading. As proved already, if foreign direct investment is the anti-trade oriented type, the capital importing country's welfare must be improved when the amount of capital inflow is large sufficiently. At the Mundellian equilibrium the tariff-induced capital movement (which is the anti-trade oriented capital movement) yields precisely the same level of economic welfare as does the free trade situation. Free capital movements even with zero commodity trade (in the case of the prohibitive tariff) increases the recipient country's welfare because capital movements will substitute for trade. Thus Kojima's main proposition of the foreign direct investment policy may not be acceptable. Tne important thing is not the patterns of capital movements (that is, his American or Japanese type of foreign direct investment), but whether the amount of capital inflow is large sufficiently. Especially when the foreign direct investment is his American type, the sufficiently large amount of capital inflow should be allowed in the recipient country.

[13] K. Kojima, ibid., *this Journal* (1975), pp. 10-12