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COMPLEMENTARITY BETWEEN TRADE AND FACTOR MOVEMENT: REVISITING MUNDELL-MARKUSEN PROPOSITIONS

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Abstract: We generate complementarity between trade and factor movement in a standard Heckscher-Ohlin-Samuelson-Mundell (HOSM) framework where the pattern of trade is determined by relative factor abundance. This alters the conventional perception. There is an interesting role of country-specific "non-traded" good in our structure.

I. INTRODUCTION

It is well known from the classic paper of Mundell (1957) that in a typical Heckscher-Ohlin model of international trade, factor trade and goods trade are substituters. If one allows two factors to flow in and out to equalize rates of return across the globe, the incentive to trade in goods will vanish. Purvis (1972) and later Markusen (1983) in his celebrated article have shown that the substitutability argument rests on the source of comparative advantage. General conditions for substitutability and complementarity have also been worked out in Wong (1986). If instead of factor endowment, the impetus for trade lies in the differences in technology, factor trade and goods trade will be complementary to each other. Jones and Neary (1985) and Neary (1995) have discussed the issue in detail. Neary (1995) has explored this problem in the context of the specific factors model of trade. Recently Collins, O'Rourke and Williamson (1997), henceforth called (CORW), have dealt with empirical investigation of the problem and by taking evidence from the experience of the Atlantic economy between 1870 and 1940, have argued strongly in factor of the complementarity hypothesis. The CORW (1997) paper does a nice job of summarizing the important issues in this line of research.

The purpose of this short paper is to develop a theoretical point in the conventional framework of international trade encompassing the ideas of Heckscher-Ohlin, Samuleson and Mundell (HOSM) and argue in favor of complementarity from a new angle

which has been unexplored so far. The motivation of the paper comes from two sources. First, the issue of factor trade and goods trade continues to interest theoreticians and empiricists involved in research on inteernational trade and economic history. Second, casual empirical observation suggests that international migration does generate certain types of trade which could not have taken place without physical relocation of labor. The paper will talk about labor movement and international trade in a contemporary context. Although CORW (1997) argue in a different context that trade and migration were never substitutes, the reason for complementarity in the present paper lies in the taste bias for non-traded goods.

An innovative and interesting piece of research in this area is by Gould (1994) who develops a rigorous empirical model to show that immigration and the US bilateral trade flows have complementarity relationship for a large number of trading partners. His work focuses on two aspects of such complementarity. Immigrants can provide better information about their home market to the local exporters, thus can reduce the transactions cost of trade. This tends to increase exports from the USA. On the other hand, the immigrants may have stronger preferences for home produce goods and therefore immigration should also increase imports into the US markets. The empirical tests find evidence in support of both these hypotheses. The theoretical point we want to make in this paper is related to the second source of complementarity. If we restrict ourselves to the traded goods and to the neo-classical HOSM framework, immigrant's preference bias for home produced traded goods should not lead to increased volume of trade. The Mundell conjecture should continue to hold given the trade pattern of the home country. The production of home exportables must suffer with an outflow of labor and the overall volume of trade must shrink. This immediately brings us to consider the role of non-traded goods. Migration has the potential to convert the non-traded goods into traded goods.

If one walks through the streets of London or New York, cosmopolitan food shops, stores with products catering to the taste of the migrants, advertisements for musical concerts meant for the people of particular national origins will be quite common. In a typical HOSM framework, people move in response to higher wages to a capital abundant country. But their tastes and preferences are exactly identical in terms of the traded goods consumed independent of thier nationality. If one brings in non-traded goods, this may be different. The service of a barber or the transport system is non-traded because it is extremely costly to trade such products. It is not because Americans will not like to have their hair cut in India if they could fly in and out in seconds and without any cost. But there is another set of non-traded goods which we define as intrinsically non-traded.

If the non-traded goods are Indian folk songs, hard rock and Persian music, it is plausible that preference for these evolve in a particular context and nationals across the borders may not enjoy both at the same time. This does not suggest that flow of information can not generate cross country taste. But to set the stage for our discussion, it is enough to recognize the existence of a set of products which are non-traded not because trading is costly, but because the demand for those will be nation-specific.

II. THE ANALYSIS

The story of complementarity proceeds in the following manner. Consider the typical HOSM structure with a non-traded good such as the ones described above. In autarchy the labor abundant country has a lower wage and as factor market opens up, labor migrate to the high wage country. This, as predicted, narrows down the endowment gap reducing the possibility of goods trade. If the taste pattern remains unaltered for the migrants, they would like to have folk singers from their country of origin. A new channel of trade opens up. The nature of the non-traded goods changes. Some of them become traded and such structural transformation leads to a different kind of complementarity. It is instructive to think of the small country model which has enough structure to highlight our basic point. Consider a small open labor abundant economy producing two trade goods and one non-traded good with capital and labor. Under usual assumptions, this country will export labor intensive product and import capital intensive good. Factor prices will be equalized through free trade in goods. This in turn determines the price of the non-traded good and the demand for non-traded good will detemine its production. The rest of the resources will determine the voluem of the traded goods.

Let us now perform the following hypothetical exercise. Suppose we physical shift some laborers from the traded sector to the rest of the world without disturing the non-traded production. This will hurt the production of the labor intensive good via the Rybczynski effect, curtailing the volume of trade in the traded sector. Prices are left unaltered, but their is now some export of the non-traded good itself. The surplus over local consumption is being shipped abroad for the emigrants. This is perfectly consistent with a trading equilibrium. With frictionless trading such relocation keeps the welfare unchanged but does exhibit complementarity. In fact, the non-traded sector must not shrink given the fact that the same amount will be consumed by the residents and non-residents. Note that the nature of the non-traded goods is extremely important here. These goods were non-traded not because it is costly to trade them, but because there was not demand for these in the rest of the world. The demand is created through the emigrants who move out of their country, but do not consume the non-traded goods available in the rest of the world.

To consider the trade and emigration dynamics, let us consider the closed economy producing two traded goods, X and, Y and one non-traded good, X_N, using capital labor and neoclassical technology. We assume that constant shares of expernditure are spent on these goods. Figure 1 and Figure 2, describe the initial autarchic equilibrium.

(P_{xo}, P_{no}) are two relative prices with good Y chosen as numeriare. D_N is the demand curve for the non-traded good. P^* is the rest of the world relative price for X.

Let us contemplate a situation where trade in goods is not allowed and labor is allowed to move. Suppose X is labor-intensive and therefore, $(P^* > P_{xo})$ $(W^*/P^*) > (W_o/P_{xo})$ a'la Stolper-Samuelson Theorm. Hence, labor will move out of this economy. Since $(X/Y)^D$, denotes "relative demand" between X and Y, this will not change. As labor leaves the country $(X/Y)^S$ curve will shift to the left raising P_{xo}. This process should continue till $(X/Y)^S$ intersects $(X/Y)^D$ at P^* ruling out the possibility of trade

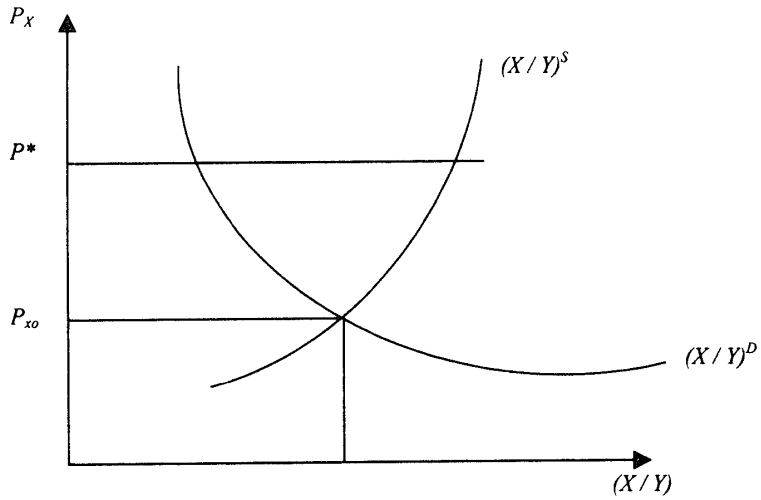

Figure 1.

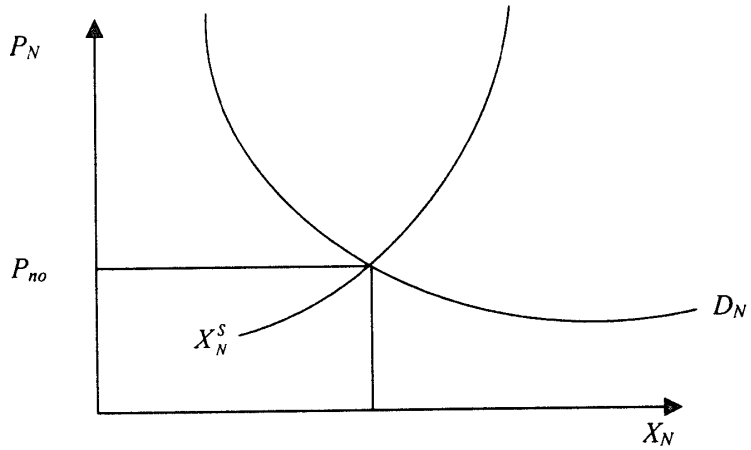

Figure 2.

in goods once labor relocates itself from the low-wage to high wage region. Note that as P_{xo} increases the difference between P^* and P_{xo} goes down reducing further the "potential volume of trade in goods" at each stage. Free factor movement will eliminate commodity trade.

Suppose our non-trade good is nationality-specific and as the emigrants move out and settle in the distant land, they still want to consume this non-traded good importing cassettes and CDs of local music. With exodus of labor, X_N^S has to shift at a given P_N, depending on the factor-intensity. As, W increases and r drops, a'la Stolper-Samuleson, cost of production in the non-traded good may go up or down, i.e. if it does up, X_N should shift to the left. A simple assumption of unit elasticity of factor substitution, can keep $(X_N)^S$ unchanged. But as P_{xo} increases, D_N should shift to the right due

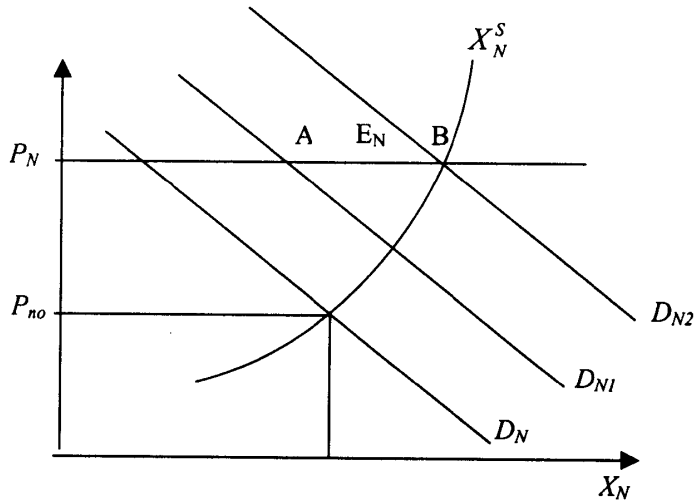

Figure 3.

to substitution effect. The real income effect, which is positive as workers are earning higher wage through a favorable movement in the factor terms of trade, may show up through increased demand for local non-traded goods by the *emigrants*. In figure 3, D_N shifts to D_{N1} due to substitution effect, and to D_{N2} due to increased demand from the emigrants. But note that at $P_N = P_{N2}$, $AB = E_N$, the amount of the non-traded good is *exported* which is consumed by the emigrants. Also note that even with factor-price equalization $W = W^*$, E_N must be positive. This in turn implies that for balance-of-trade condition to hold, there has to be positive net imports of erstwhile traded goods. In other words it is perfectly possible that with movement of factor, that equalities "W" across the world, trade in goods does not vanish. E_N will pay for imports of other goods. Complementarity between trade and factor-movement is induced through movement of labor.

III. CONCLUDING REMARKS

Merkusen (1983) stands as the most general paper on the idea of complementarily between trade in goods and factors. The supply side sources of comparative advantage, except the factor abundance hypothesis lends support to the idea that goods trade and factor trade should be complements. In other words, it seems that to get complementarity one definitely needs to get out of the standard HSOM framework. The purpose of the present note is that one may get the complementarity precisely because the endowment difference leads to labor outflow and generates trade in erstwhile non-traded goods. The bottom line is that the HSOM structure is capable of generating complementarity provided one brings in the type of non-traded goods mentioned above.

Here factor mobility transforms the trade structure by converting the non-traded goods into tradeables. Interestingly, the demand pattern of the emigrants matter and that retains the native flavor. Further research in this area has to proceed on the issue of

information dissemination through telecommunication. These tend to contract the set of so called "non-traded" goods.

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