The heckscher ohlin model and missing trade economics essay

The Heckscher-Ohlin (HO) model states that comparative advantage is determined by countries' relative factor abundance, and production of goods that required different combinations of factors, that is, relative factor intensity, where it essentially assumes only two countries, two factors of production and two goods being produced.

Theoretically, the HO theorem says that the exports of a capital-abundant country will be from capital-intensive industries, and labour-abundant countries will import such goods, exporting labour-intensive good in return. The Heckscher-Ohlin-Vanek (HOV) theorem generalises the HO theorem and states that a capital-abundant country exports capital services. While the HO model is a fundamental core of international trade theory, empirically, however, these theorems have been rejected over the years by many authors. Trefler (1995) argues that factor prices are not equalised across countries as the model essentially assumed. The actual factor trade volume is much smaller than what the Heckscher-Ohlin model predicts?'Missing Trade'. Trefler (1995) studies systematic deviations of the data from the theoretical predictions of HOV equations. This essay is going to outline how Trefler (1995) modifies the basic HO model in order to better explain the data and outline some of the empirical evidence presented in his modified framework.

The HOV model comprises of four theorems? the HO theorem, factor price equalisation (FPE) theorem, the Stopler-Samuelson theorem, and Rybczynski's theorem. The first two theorems are most relevant to explain ' the case of missing trade.' Trefler (1995) captures the model in the following equation:

F_fc=(V_fc-s_c V_fw) {?(f= 1,', F@c= 1,', C)' (1)

F_fc denotes ' factor content of net exports'? that is the amount of fator f emobodied in a country's exports. V_fc represents the endowment of factor f in country c. s_c is country c's consumption share of world factor emdowments V_fc. The equation (1) above states that if country c is abundant in factor f(V_fc/V_fw> s_c), it will export such goods where the production is intensive in factor f, thus effectively exporting the services of factor f(F_fc> 0). This conclusion is from the HO theorem, which is based on the assumption that countries have identical preferences. Secondly, the conclusion also has an implication of FPE theorem, supported by Davis and Weinstein (1998, p. 7). FPE basically says that free trade allows relative good prices to converge and eventually leads to real factor price convergence. Therefore, as Feenstra (2004) stated, FPE implied that ' trade in goods is a ' perfect substitute' for trade in factors' and disagrees factor intensity reversals. Trefler (1995) considered the Chinese case, a country that is abundant in labour, and exports labour-intensive product, cloth. This means that China sells labour abroad, as embodied in its labour-intensive export.

Trefler (1995) constructs an equation introducing an error term to equation (1) in order to observe deviations from the HOV theorem:

F_fc=(V_fc-s_c V_fw)+'_fc

or

' _cf= F_fc-(V_fc-s_c V_fw)

(2)

The HOV theorem can be tested in several ways. One method involves examining the ration of the variances of F_fc against (V_fc-s_c V_fw). A perfect fit of the HOV theorem would mean that this ration is equal, or close to 1. Trefler (1995)'s result for this was 0. 032 and in absolute values, factor service trade is much smaller than its factor-endowments prediction, reflecting ' Missing Trade', as Trefler (1995) calls. This is puzzling as the observed factor trade content is much smaller than what is predicted by the relative endowments of the countries. Another method would be to conduct a ' sign-HOV' test, a relaxed version of the HOV theorem first introduced by Bowen et al. checking for the percentage of observations in which F_fc and (V_fc-s_c V_fw) have the same sign.

Figure 3 illustrates a graphical way of analysing deviations from the HOV theorem. When he plotted factor service trade against endowments, ' _cf is approximately equal to -(V_fc-s_c V_fw) which of course implies F_fc is close to zero. Equation (2) implies that all points should lie on the horizontal line? '? _cf= 0. Points above the horizontal line (F_fc> 0) imply that the country is a net exporter, and points below (F_fc <0) imply that the country is a net importer, of factor f. The sign-HOV test implies that all the points should lie in the regions F_fc> 0 and (V_fc-s_c V_fw)> 0 or F_fc <0 and (V_fc-s_c V_fw)<0. However, almost all the observations lie on the diagonal line. This indicates a ' missing trade' where factor trade volume is much smaller than what is suggested by the countries' relative factor endowments.

(Figure 1) Plot of ' _cf= F_fc-(V_fc-s_c V_fw) against (V_fc-s_c V_fw)

When this is the case, FPE does not actually hold in real world. There are wide wage variations around the world as evidence in Krugman and Obstfeld (2006) shows . The assumptions of the HOV model do not seem to fit well to explain this. Trefler (1995) then modifies the model to try to fit the data better. As many trade economists believed, the puzzle can be resolved by focusing his attention on the HO assumption that technologies and preferences are the same across the countries.

Trefler (1995) modifies the assumption of identical technologies in two ways. The first way Trefler (1993) approached states that productivity of factors? '? _fc was essentially different across countries. However, Trefler (1995) said there were ' as many parameters as observations' and here the HOV model could not be tested empirically. Therefore, Trefler (1995) secondly approaches as he said factors are essentially different but methods of using these technologies now differ,? '? _fc='_c. Also, he allowed for technological differences between two large groups of ' poor', C_LDC, and ' rich' countries, C_DC. The productivity of poor countries is a fraction of the rich countries: ' _fc='_f for c'C_DC. Trefler's (1995) modification here is similar to that of Davis and Weinstein's (2001) . In the final model related to the identical-technologies assumption, Trefler (1995) brings up together the ' neutral (' _c)' and ' non-neutral (' _c)' technological differences in the same model as below:

Trefler (1995) refers to Armington (1969) home bias that notes that consumers display a bias toward goods produced domestically. Let ' _c represent preference for domestic goods, and ' _c^* preference for goods produced overseas. If the assumption of identical preferences holds, '

_c=’_c^*= 1. ‘ _c> 1 and ‘ _c^*<1 capture home bias. Trefler (1995) modifies equation (2) to take into account home bias:

F_fc= V_fc-s_c [(1-‘ _c^*)Y_w/Y_c V_fc+’_c^* V_fc]+’_fc (4)

(Table 1) Hypothesis testing and model selection

Trefler (1995) used the above table explaining the results of the various models Table 2. The column on the first right shows ‘, the correlation between observed and predicted factor contents . In the original HOV model, ‘ was 0. 28. The ‘ values rise for all modified models presented. How well the model of technological differences performs is seen by results obtained for the coefficients estimates of ‘ _c and ‘ _f against Trefler’s (1995) criteria? non-negativity, the country’s level of technology relative to the U. S., and correlation of relative productivity to per capita income. Putting together the neutral technological differences and Armington home bias, the final modified version of HOV model shows that the data prefers this more general model, ? TC? _2 . The success rate of the sign-test goes up to 0. 72 (0. 93 when weighting by size), while the correlation between actual and predicted contents goes up to 0. 67 from 0. 28.

While this was the case, Bowen, Leamer and Sveikauskas (BLS, 1987) should be credited for conducting the first complete the sign-HOV test on the validity of the model. BLS (1987) used data on 12 factors and 27 countries in 1967, allowing for neutral technological differences with the same preferences . BLS (1987) found that, ‘ _c values that are much greater than 1, implying that their technology is superior to that of the U. S. From two

types of tests they performed, the sign tests are correct about 60% of times, while rank test only 49% of times.

Instead of BLS's (1987) model estimation along the F_fc='_c V_fc-s_c ' _j'V_fj +'_fc line, Trefler (1995) estimated his model using F_fc='_c V_fc-s_c ' _j'?'_c V_fj ?+'_fc and estimated ' _cs again. The results contrast sharply with those of BLS (1987) and provide the first rejection of the HOV model hypothesis in favour of a satisfying, economically meaningful alternative .

To conclude, Trefler (1995) believed the major cause of the ' missing trade' in the HOV model was the unsustainable assumption that the technologies are identical. Although it may be useful for understanding welfare effects of trade, the HO model may not be so useful for predicting the volume and patterns of trade? the HO model performs poorly and he therefore built up a satisfying, economically meaningful alternative to the original HOV model by combining Armington home bias and technological differences.