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A HECKSCHER-OHLIN ANALYSIS
OF THE LAW OF DECLINING INTERNATIONAL TRADE

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1. Introduction

At the turn of the century the leading German economic historian Werner Sombart (1913) tried to show, by statistical observation and inductive reasoning, that there existed a tendency of decline of foreign relative to domestic trade. Later writers dubbed Sombart's hypothesis "the law of declining international trade". According to Sombart, foreign trade consisted mainly of exchange between agricultural and industrial countries. As the agricultural countries industrialized, the exchange of agricultural for industrial goods would increasingly take place within instead of across national boundaries. Essentially the same view, but explicitly cast in terms of comparative advantage, had been expressed much earlier by the classical economist Robert Torrens (1821). He noted that land abundant countries, which were exporters of food and raw materials, had relatively rapid increases in capital and population. Comparative costs would therefore become equalized between land abundant and capital-cum-population abundant countries, and the basis for international exchange largely disappear.

Sombart's hypothesis served to ease German worries that the country's new industrial status would make her more dependent than before on foreign buyers and suppliers by saying that industrialism

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would bring about less, not more trade. Some thirty years later, when world trade was strangled by bilateral trade wars, those who feared the consequent economic costs found comfort in a leading economist of the time, namely Keynes (1933), who wrote: "Moreover, with greater wealth, both primary and manufactured products play a smaller relative part in the national economy compared with houses, personal services, and local amenities, which are not equally available for international exchange; with the result that a moderate increase in the real cost of primary and manufactured products consequent on greater national self-sufficiency may cease to be of serious consequence when weighted in the balance against advantages of a different kind." Apparently, Keynes advanced another reason for declining international trade, namely that non-traded activities would claim an increasing share of national product with higher per capita income. This view of the relation between high income elasticity for non-traded goods and services, and the proportion of trade in national product has also been expressed by Kuznets (1959), Deutsch and Eckstein (1961), and Kindleberger (1962). It constitutes the modern version of "the law of declining international trade".

The purpose of this paper is to analyze more rigorously the effect of changes in the share of non-traded goods in the national product on the share of exports (or imports) in the national product within the framework of the Heckscher-Ohlin model of trade. The analysis treats preferences, technology, factor endowments and prices on tradables as exogenous, and studies the effects of changes in the exogenous variables which are thought to correspond to empirical developments in capital abundant (industrial) countries. Specifically, we presume (i) that preferences are shifting towards non-traded goods and, in particular,

services, and that the income elasticity of these goods and services is high, (ii) that the rate of (Hicks-neutral) technical progress is higher in the production of tradables than in non-traded goods, and (iii) that the aggregate capital labor ratio is rising as a result of quite rapid capital accumulation and virtually constant labor supply. (We have no presumption about long-term trends in the terms of trade.) A crucial assumption is that production of non-traded goods is more labor intensive than production of tradables.

Contrary to the predictions of Keynes et al., it is shown that a capital abundant country with a growing non-traded sector will see its trade share increase. The reason for this apparently paradoxical result is that the increase in the non-traded sector strengthens the comparative advantage position of the country in capital intensive goods, and therefore the degree of specialization in the traded sector.

The paper is organized as follows. In Section 2 the model, a Heckscher-Ohlin model with one non-traded good and two tradable goods, is presented. Section 3 analyses the effects on the trade share of a shift in taste towards non-traded goods, and Section 4 and 5 analyse the effects of capital accumulation and technical change, respectively. Section 6, finally, points out some limitations of the analysis. The section also contains empirical findings on the trade share from time series and cross-section studies.

2. The model

There are three goods, exportables, importables and non-traded goods, which are produced in the quantities X_1 , X_2 and X_N . Technology is characterized by constant returns to scale. The two factors of production are labor and capital. Their supplies, L and K , are given and fixed, and they are always fully employed. We can write the full employment conditions as

$$(1) \quad a_{L1}X_1 + a_{L2}X_2 + a_{LN}X_N = L \quad \text{and}$$

$$(2) \quad a_{K1}X_1 + a_{K2}X_2 + a_{KN}X_N = K,$$

where a_{ij} is per unit input of factor i into good j .

Perfect competition in goods and factor markets is assumed. Under competitive conditions price equals cost, i.e.

$$(3) \quad a_{L1}w + a_{K1}r = p_1,$$

$$(4) \quad a_{L2}w + a_{K2}r = p_2 \quad \text{and}$$

$$(5) \quad a_{LN}w + a_{KN}r = p_N,$$

where w is the wage rate and r is the rental rate. We will assume that prices of tradables, p_1 and p_2 , are given on world markets.

The input-output coefficients a_{ij} are functions of relative factor

prices and a given state of technology τ :

$$(6) - (11) \quad a_{ij} = a_{ij}(w/r, \tau) \quad ; i = K, L \\ j = 1, 2, N.$$

We assume that consumers have identical and well-behaved utility functions. From utility maximization subject to a national income constraint we can in the usual way obtain aggregate demand functions for goods,

$$(12) - (14) \quad D_j = D_j(p_2, p_N, Y) \quad ; j = 1, 2, N,$$

where the exportable good has been chosen as numeraire, and Y denotes national income.

We impose that demand for non-traded goods must equal supply,

$$(15) \quad D_N = X_N.$$

National income is made up of total factor income,

$$(16) \quad Y = wL + rK.$$

Equations (1) - (16) determine outputs, X_1 , X_2 and X_N , demands D_1 , D_2 and D_N , factor prices, w and r , the price of non-traded goods, p_N , six input-output coefficients, a_{ij} , and national income, Y .

It is more convenient to work with this system when it is expressed in rates of change. Differentiate logarithmically and substitute in the

equations for the input-output coefficients to obtain ¹

$$(17) \quad \lambda_{L1} \hat{X}_1 + \lambda_{L2} \hat{X}_2 + \lambda_{LN} \hat{X}_N - \delta_L (\hat{w} - \hat{r}) = \hat{L} + \pi_L,$$

$$(18) \quad \lambda_{K1} \hat{X}_1 + \lambda_{K2} \hat{X}_2 + \lambda_{KN} \hat{X}_N + \delta_K (\hat{w} - \hat{r}) = \hat{K} + \pi_K,$$

$$(19) \quad \theta_{L1} \hat{w} + \theta_{K1} \hat{r} = \hat{p}_1 + \pi_1,$$

$$(20) \quad \theta_{L2} \hat{w} + \theta_{K2} \hat{r} = \hat{p}_2 + \pi_2,$$

$$(21) \quad \theta_{LN} \hat{w} + \theta_{KN} \hat{r} - \hat{p}_N = \pi_N,$$

$$(22) \quad \hat{Y} - \theta_L \hat{w} - \theta_K \hat{r} = \theta_L \hat{L} + \theta_K \hat{K},$$

$$(23) \quad \hat{D}_1 - [\eta_{12} \hat{p}_2 + \eta_{1N} \hat{p}_N + \eta_{1Y} \hat{Y}] = 0,$$

$$(24) \quad \hat{D}_2 - [\eta_{22} \hat{p}_2 + \eta_{2N} \hat{p}_N + \eta_{2Y} \hat{Y}] = 0,$$

$$(25) \quad \hat{D}_N - [\eta_{N2} \hat{p}_2 + \eta_{NN} \hat{p}_N + \eta_{NY} \hat{Y}] = 0, \text{ and}$$

$$(26) \quad \hat{D}_N - \hat{X}_N = 0,$$

where

" $\hat{}$ " = rate of change. For example $\hat{X}_1 = dX_1/X_1$;

λ_{ij} = the share of total supply of factor i ($i = L, K$) used in production of good j ($j = 1, 2, N$). (For example

$$\lambda_{L1} = (a_{L1} X_1)/L.);$$

θ_{ij} = the cost share of factor i ($i = L, K$) of the price of good j ($j = 1, 2, N$). (For example, $\theta_{L1} = (a_{L1} w)/p_1$.);

θ_i = the share of factor i ($i = L, K$) in national income;

¹ For derivations see Jones (1965).

η_{ij} = the price elasticity of demand of good i ($i = 1, 2, N$) with respect to price j ($j = 2, N$). (We assume that $\eta_{ij} > 0$ for $i \neq j$ and $\eta_{ij} < 0$ for $i = j$.);

η_{iY} = the income elasticity of demand of good i ($i = 1, 2, N$);

$\pi_i = \lambda_{i1}\hat{c}_{i1} + \lambda_{i2}\hat{c}_{i2} + \lambda_{iN}\hat{c}_{iN}$, the rate of reduction in the use of factor i ($i = L, K$) due to pure technical progress τ . (The symbol $\hat{c}_{ij}$ ($i = L, K$; $j = 1, 2, N$) denotes the (negative) rate of change of input-output coefficient a_{ij} due to factor-saving technical progress.);

$\pi_j = \theta_{Lj}\hat{c}_{Lj} + \theta_{Kj}\hat{c}_{Kj}$, the rate of reduction in unit cost (price) of good j ($j = 1, 2, N$) due to technical progress; and

$\delta_i = \lambda_{i1}\theta_{j1}\sigma_1 + \lambda_{i2}\theta_{j2}\sigma_2 + \lambda_{iN}\theta_{jN}\sigma_N$ ($i, j = L, K$; $i \neq j$), the change in use of factor i ($i = L, K$) due to factor substitution following factor price changes.

The recursive structure of the model should be noted. Equations (19) and (20) give changes in factor prices, which in turn give changes in the price of non-traded goods and in national income, equations (21) and (22) respectively. Next, changes in all demands and in the output of non-traded goods can be determined from (23) - (26). Finally, changes in outputs of tradables are given from (17) together with (18).

3. Increased taste for non-traded goods

In this section we analyse the effects on the trade share of a ceteris paribus increase in taste for non-traded goods. Formally, we choose to introduce a taste shift into the model by making demand for non-traded goods exogenous.² Thus, equations (14) and (25) are eliminated temporarily.

It is a well-known property of the Heckscher-Ohlin model with non-traded goods that factor prices and the price of non-traded goods are unaffected by changes in domestic demand (see e.g. Komiya (1967)). As can be seen by (19) - (21) these prices are only determined by world market prices on tradables and by technical change. Furthermore, by (22) national income is unchanged when we let demand for non-traded goods increase.

From Walras' law it follows that changes in demand fulfill

$$\alpha_1 \hat{D}_1 + \alpha_2 \hat{D}_2 + \alpha_N \hat{D}_N = 0,$$

where $\alpha_j = (p_j D_j)/Y$; $j = 1, 2, N$. To know how demand for tradables change we have to make an assumption; we assume that, in analogy with homotheticity, the proportions in which the two tradables are consumed remain constant. Since demand for non-traded goods increases, it follows that demand for both exportables and importables will decrease. Specifically, we have that

² An alternative is to include a taste parameter in the demand equations. A shift in taste for non-traded goods will not change prices and income, and thereby cause secondary effects on the demand for non-traded goods. Therefore the alternative chosen is preferable because it is more simple.

$$(27) \quad -\hat{D}_1 = -\hat{D}_2 = \frac{\alpha_N}{\alpha_1 + \alpha_2} \hat{D}_N.$$

The output of non-traded goods must increase at the same rate as demand, see equation (26). Solving for rates of change in outputs of exportables and importables we get

$$(28) \quad \hat{X}_1 = \frac{(\lambda_{L2}\lambda_{KN} - \lambda_{LN}\lambda_{K2})}{(\lambda_{L1}\lambda_{K2} - \lambda_{L2}\lambda_{K1})} \hat{X}_N \quad \text{and}$$

$$(29) \quad \hat{X}_2 = -\frac{(\lambda_{L1}\lambda_{KN} - \lambda_{LN}\lambda_{K1})}{(\lambda_{L1}\lambda_{K2} - \lambda_{L2}\lambda_{K1})} \hat{X}_N.$$

The direction of change will depend on relative capital intensities as given by the terms within parenthesis. For example, the denominator can be written as $[(a_{L1}a_{K2} - a_{L2}a_{K1})(X_1X_2)]/KL$ and is negative if exportables are capital intensive relative to importables. The hypothesis of declining international trade has been formulated for the relatively developed, high-income countries at a particular point in time. These countries presumably are capital abundant relative to the rest of the world, and they should therefore, according to Heckscher-Ohlin theory, be exporting capital intensive and importing labor intensive goods. In other words, we should let the exportable good be capital intensive relative to the importable good. Non-traded goods consist mainly of private and public services. According to conventional wisdom these are labor intensive. ³

3 Flam (1981) presents data on various measures of capital intensity for 23 sectors of the Swedish economy in 1950, 1958, 1966 and 1974. The data are based on both stocks and flows, and consider physical as well as human capital. My findings are that non-traded goods on the average are more capital intensive than tradables. An explanation is that many non-traded sectors have much physical capital in the form of buildings and other structures. See also the remarks in Section 6.

Thus, here and in what follows, exportables are capital intensive, non-traded goods are labor intensive and importables are intermediate. From (28) and (29) we then have that exportables will expand and importables contract.

In summary, demand for exportables falls while output rises. National income (or product) is constant. It is immediately clear that the ratio of exports to national income will increase where the demand and output of non-traded goods are raised.⁴ The ratio of imports to income will also increase, since exports and imports always balance in our model.

The experiment of a shift in taste towards services throws light on a mechanism whereby an increase in the share of non-traded goods in national output may actually raise the trade share. The expansion of non-traded goods draws much labor and little capital from the tradable sector, leaving the latter more capital intensive than before. To maintain both factors fully employed in the tradables sector, capital intensive exportables must increase and labor intensive importables decrease; this is simply the Rybczynski (1955) effect in the tradable sector.

4 It can be shown that a sufficient condition for this to occur is that the non-traded sector is labor intensive relative to the tradable sector as a whole; it need not be labor intensive relative to importables.

4. Increased capital abundance

In this section we will assume that growth is synonymous with a costless increase in the capital stock. We will further assume that demand for services has an elasticity greater than unity with respect to the increase in income which the addition of capital represents.

Again, factor prices and the price of non-traded goods are unaffected. National income increases by the rental rate times the increase in capital. The rate of increase is

$$(30) \quad \hat{Y} = \theta_K \hat{K}.$$

In the absence of price changes, the change in income is the only influence on domestic demand,

$$\hat{D}_j = \eta_{jY} \theta_K \hat{K}, \quad j = 1, 2, N.$$

To be able to rank rates of change in demand we have to make some further assumptions. Assume that income elasticities are ordered as

$$\eta_{NY} > \eta_{1Y} = \eta_{2Y} > 0.$$

We note that the weighted average income elasticity is unity,

$$\sum_j \alpha_j \eta_{jY} = 1, \quad j = 1, 2, N.$$

Under these assumptions the ordering of rates of change in demand is

$$(31) \quad \hat{D}_N > \hat{D}_1 = \hat{D}_2 > 0.$$

Rates of change in outputs are given by

$$(32) \quad \hat{X}_N = \eta_{NY} \theta_K \hat{K}.$$

$$(33) \quad \hat{X}_1 = \frac{(\lambda_{L2} \lambda_{KN} - \lambda_{LN} \lambda_{K2})}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} \eta_{NY} \theta_K \hat{K} - \frac{\lambda_{L2}}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} \hat{K} \quad \text{and}$$

$$(34) \quad \hat{X}_2 = - \frac{(\lambda_{L1} \lambda_{KN} - \lambda_{LN} \lambda_{K1})}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} \eta_{NY} \theta_K \hat{K} + \frac{\lambda_{L1}}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} \hat{K}.$$

The rate of increase in non-traded goods, equation (32), may exceed the rate of increase in capital for high values of the income elasticity and capital's national income share. The rate of increase in exportables, on the other hand, must exceed that of capital, since both terms on the RHS of (33) are positive and the ratio $\lambda_{L2}/(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})$ is greater than unity in absolute value. The first term is the Rybczynski effect on exportables of an increase in non-traded goods noted in the preceding section, and the second term is a "direct" Rybczynski effect due to the increase in capital. Importables, equation (34), must contract for analogous reasons; both terms on the RHS are negative.

Collecting our results for demands and outputs we have that

$$(36) \quad \hat{X}_1 > \hat{K}_1 > \hat{Y} > \hat{D}_1 = \hat{D}_2 > \hat{L} = 0 > \hat{X}_2 \quad \text{and}$$

$$\hat{X}_N = \hat{D}_N > \hat{Y} > \hat{D}_1 = \hat{D}_2.$$

We are now able to determine the effect of an increase in capital on the trade share. Note in (36) that the rate of change in national income, $\hat{Y}$, is bounded by the rates of change of exportable production, $\hat{X}_1$, and domestic demand, $\hat{D}_1$, with the latter being the lower rate. Hence, we can immediately conclude that the trade share rises. Also, consider conditions, expressed in rates of change, for marginal export and import shares respectively to be greater than the corresponding average shares,

$$(37) \quad \frac{\hat{P}_1}{\hat{Y}} + \frac{\hat{X}_1}{\hat{Y}} - 1 > \frac{D_1}{X_1} \left(\frac{\hat{P}_1}{\hat{Y}} + \frac{\hat{D}_1}{\hat{Y}} - 1 \right) \quad \text{and}$$

$$(38) \quad \frac{\hat{P}_2}{\hat{Y}} + \frac{\hat{D}_2}{\hat{Y}} + 1 > \frac{X_2}{D_2} \left(\frac{\hat{P}_2}{\hat{Y}} + \frac{\hat{X}_2}{\hat{Y}} + 1 \right) .$$

Using the results in (36) the LHS of (37) is positive, and the RHS negative.

5. Increased efficiency in the tradable sector

Instead of taking growth as synonymous with factor augmentation, we will in this section assume that it is due to technical progress. Specifically, we assume that Hicks neutral technical progress takes place in the production of exportables and importables at a uniform rate, and that no technical progress takes place in the production of non-traded goods. Such a differential has strong empirical support, see e.g. Fuchs (1967) for the relative rate of productivity increase in services and Flam (1981). In terms of our model the assumption is that

$$\pi_1 = \pi_2 = \pi_T > \pi_N = 0 ,$$

where π_T is the uniform rate of technical change in the tradables sector.

Factor prices, the price of non-traded goods and national income all increase at the same rate as technical change, cf. equations (19)-(22)

$$(39) \quad \hat{w} = \hat{r} = \hat{p}_N = \hat{Y} = \pi_T.$$

Factor rewards are raised because factors are now more productive in making exportables, the numeraire good. The increase in the price of non-traded goods reflects increased costs, and the increase in national income increased factor rewards in terms of exportables.

The demand equations (23) - (25) can now be written as

$$(40) \quad \hat{D}_j = (\eta_{jN} + \eta_{jY}) \pi_T , \quad j = 1, 2, N.$$

We make the reasonable assumptions that cross-price and income elasticities are positive. It follows that demand for both tradables

must increase. There is no presumption that demands for exportables and importables are different; we will assume that income and cross-price elasticities are the same so that the rates of increase in the two demands are equal. As for non-traded goods demand, the direction of change depends on the size of the own-price elasticity relative to that of the income elasticity. The latter is, according to the proponents of the modern version of the law of declining international trade, higher than unity. There is some evidence for Sweden that the own-price elasticity is equal to or lower than the income elasticity for the aggregate of non-traded goods (Flam (1981)). We will assume that the elasticities are equal in size, and only indicate what the effects would be with a relatively higher income elasticity. Under these assumptions about demand parameters it can be shown that

$$(41) \quad \hat{D}_1 = \hat{D}_2 = \hat{Y} > \hat{D}_N = 0 \quad .^5$$

Outputs change at the rates given by

$$(42) \quad \hat{X}_N = (\eta_{NN} + \eta_{NY}) \pi_T ,$$

$$(43) \quad \hat{X}_1 = \left[\frac{(\lambda_{L2} \lambda_{KN} - \lambda_{LN} \lambda_{K2})}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} (\eta_{NN} + \eta_{NY}) + 1 \right] \pi_T = \pi_T \quad \text{and}$$

$$(44) \quad \hat{X}_2 = \left[\frac{(\lambda_{L1} \lambda_{KN} - \lambda_{LN} \lambda_{K1})}{(\lambda_{L1} \lambda_{K2} - \lambda_{L2} \lambda_{K1})} (\eta_{NN} + \eta_{NY}) + 1 \right] \pi_T = \pi_T .$$

5 $\hat{Y}$ is a weighted average of $\hat{D}_1$, $\hat{D}_2$ and $\hat{P}_N$ in this case. By (39) $\hat{Y} = \hat{P}_N = \pi$. Since $\hat{D}_1 = \hat{D}_2$, (41) follows.

Under the assumption that the price and income elasticities are equal in size in the demand for non-traded goods there will be no change in the output of non-traded goods, and the output of exportables and importables will increase at the same rate as technical progress. (A rise in the output of non-traded goods would cause trade biased Rybczynski effects in the tradables sector in the way shown in Section 4.)

Summing up, the ordering of rates of change in demand, output and income is

$$(45) \quad \hat{D}_1 = \hat{D}_2 = \hat{X}_1 = \hat{X}_2 = \hat{Y} > \hat{X}_N = \hat{D}_N = 0 \quad .$$

Consider now the conditions for an increase in the trade share, (37) and (38). Substituting in the results summed up in (45) both sides become equal. Hence, there is no change in the trade share. (The share would increase if we change our assumptions about demand for non-traded goods so that the income elasticity is greater than the price elasticity.)

6. Limitations of the analysis

The conclusion of the analysis, or at least the strong presumption, is that a growing, capital abundant country will become increasingly dependent on trade. The non-traded sector, instead of playing an anti-trade biased role, is instrumental for this outcome. How seriously one is to take this conclusion depends on the limitations of the analysis; some limitations will be pointed out below. But first, two paragraphs are devoted to possible empirical support for the law of declining international trade.

The number of attempts to establish significant association between the trade share and other economic variables, such as GNP or per capita income, is quite small. Kuznets (1967) found no average trend in long term time series data for individual countries. Deutsch and Eckstein (1961) present data for the period 1913 - 1957 for 11 countries, and time series data for both the 19th and 20th century for a few of these countries, and they conclude that there exists an increasing trend in the 19th century and a decreasing trend in the 20th century in the trade share. Kindleberger (1962) seems to share their interpretation of the data, while Lipsey (1963) comments that Deutsch and Eckstein's conclusion requires "a considerable effort of the imagination". If the time span is limited to the post World War II period it is of course true that the volume of trade has grown more rapidly than GNP in the industrialized countries.

Cross-section findings are somewhat contradictory to the results from time series studies. Kuznets (1964) established negative associations between the trade share on one hand, and GNP and population size respectively on the other among 120 countries in 1958. When his

per capita income data are adjusted for economic size (GDP), there exists a significant positive association between the trade share and per capita income. Kuznets' study has been criticized by Studenmund (1973) on the grounds that it did not allow for non-linear relations. Studenmund divides 66 countries, mostly in 1967, into three per capita income groups, and obtains significant positive correlations for the lowest group, and significant negative correlations for the two higher groups. (The results are insensitive to alternative groupings.) Thus, if one is prepared to draw conclusions about time trends from cross-section data it seems that Studenmund's result lends support to the law of declining international trade.

One crucial assumption in my analysis is that the non-traded sector is labor intensive relative to the sector producing tradables. It has already been mentioned that this assumption, although it is part of conventional wisdom, may not conform to actual facts, at least in Sweden. The assumption is a knife-edge condition: if the difference in factor proportions is small between the tradable and the non-traded sector there will be large reallocations in the tradable sector following changes in the size of the non-traded sector (either trade or anti-trade biased, depending on the factor intensity ordering). The reason is that with small factor proportions differences large reallocations are required to keep all factors fully employed. The bigger the difference in factor proportions the smaller the reallocations.

It has been assumed that the non-traded sector increases its share of total product as factor endowments increase and there is technical progress. The assumption is supported by cross-section and time series studies by Kuznets (1971) of the private part of the economy for the non-traded sector as a whole, but not for private services, which are the non-traded activities Keynes had

in mind when he made his statement referred to in the introduction. Private services make up roughly 80 per cent of the private non-traded sector in the most advanced countries.⁶ The share of services in total product is more or less constant in both cross-section and time series data according to Kuznets. It is therefore not clear that services are subject to a high income elasticity of demand. The share of services in total labor force, on the other hand, is rising steadily, with per capita income, reflecting a lower than average productivity increase in the service sector. Consequently, the share of services in total income is also increasing, as a result of ~~higher relative prices for services. The conclusion to be drawn from~~ Kuznet's findings is that the private non-traded sector has grown over time, but not much, and that therefore its effects on resource allocation in the tradable sector and on trade proportions as told by the Heckscher-Ohlin model are not very strong. It is possible that inclusion of public services would mean a higher relative growth of the non-traded sector and stronger effects.

It should be pointed out that the analysis in sections 3 - 5 is based on the implicit assumption that the rest of the world is constant. Most importantly, it is assumed that factor supplies are constant, so that the difference in factor endowments is increasing between the capital abundant country and its trading partners. If anything, this difference has been decreasing between industrial

6 Kuznets divides the economy into 3 major sectors, Agriculture, Industry and Services. Industry and Services are then subdivided into 5 sectors each. The subdivisions of Industry are Mining and quarrying, Manufacturing, Construction, Electricity, gas and water, and Transport and communication. In the discussion above, the non-traded sector is defined to consist of the last three subsectors plus the whole of Services.

and less industrialized countries in recent decades. Hence, the basis for trade according to the standard Heckscher-Ohlin model has been diminished. Increased capital abundance in the rest of the world would result in falling prices on capital intensive goods, ceteris paribus, and hence in decreased specialization and trade dependence in our model economy.

Finally, in cataloguing limitations of the present analysis I should also point out that the standard Heckscher-Ohlin model, which has been employed here, does not capture other important determinants of international trade than differences in factor proportions, such as economies of scale and product differentiation. A full theoretical investigation of the relation between the trade share of GNP and income per capita should therefore employ a model which incorporates these factors, as the elegant generalization of the Heckscher-Ohlin model by Helpman (1981). As observed by Helpman, his model is capable of explaining the general post World War II development of increasing trade shares in the industrialized countries by taking account of increasing product differentiation and economies of scale with higher levels of total income.

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