Trade

& Structural Change

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To my wife Clara and children, Mark and Karen

PREFACE

During the 1960s the world economy grew at an unprecedented rate. Expanded trade volumes were accommodated with a minimum of friction as the advantages emanating from trade and specialisation were widely realised and perceived. Similarly, tariffs and other trade barriers were steadily dismantled in the general expectation that within a relatively free trade regime, the world economy would become increasingly integrated and prosperous. Unfortunately, with the advent of recessionary forces which manifested themselves with menacing vigour in the wake of OPEC price rises, and of the near univeral imperative to contain inflation, hopes for immediate and continued economic progress withered. Industrial nations have begun to doubt the value of unfettered free trade and disaffected elements within them have been seeking to bolster flagging incomes and employment prospects through the curtailment of imports. This trend has been particularly ominous for the newly emerged industrial less developed countries (LDCs) which, despite the world recession, have made dramatic headway in gaining comparative advantages in fields which have hitherto been the exclusive prerogative of the wealthy. As matters now stand, if the OECD countries are yet again to derive maximum trade gains and if their economic recoveries are to be founded on sustainable and healthy foundations, sooner or later they have to respond to the changing international environment by undertaking various structural adjustments. With this issue in mind, this book attempts to enhance the reader's understanding of the implications of living in a period of imminent trade induced adaptations. Hopefully, this greater understanding will be achieved through the provision of a concise review of the forces that generate trade and those that retard it, and of the difficulties entailed in coming to terms with the decline of traditional industrial activities.

This book can readily be followed by anyone with a basic knowledge of first year university/college or even high school economics. It is partly based on material presented in an undergraduate international economics course at Macquarie University but it would also be of value to postgraduate students wishing to obtain a bird's eye view of salient trade issues. I have attempted to economise on verbiage and, accordingly, I sincerely hope that any prospective reader fearing that on

account of the book's apparent brevity, major considerations are not comprehensively reviewed, would soon have such fears allayed. In short, I have tried to provide a comprehensive yet compact rendition of our current understanding of some trade and structural transformation problems.

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Preface

1 TRADE DETERMINATION THEORIES

Classical Trade Theory

From the late eighteenth century, with the advent of Adam Smith's pioneering tract *The Wealth of Nations*, the probable causes and consequences of international trade have preoccupied the minds of renowned economists. Until fairly recently, Ricardo's comparative advantage doctrine held sway. In its most rudimentary form, the Ricardian or classical theory assumes a two country world in which each country produces the same two commodities with one homogeneous production factor; labour. Fixed input-output ratios, which may differ across industries within a country or within an industry between countries, exist. Labour is assumed to be fully employed and internally mobile. Perfect competition prevails so that internal pre-trade prices are equal to marginal costs which are determined by labour-product coefficients. Within this general setting, the potential for profitable international exchange lies in differences in each country's relative price structure. This is so, even if one country is absolutely more efficient in the production of both goods. If for instance, in one country, say the USA, a unit of each product, say cloth and wheat, is produced by 4 and 2 labour units respectively, and in the other country, say the UK, 8 labour units yield a unit of either commodity, mutually advantageous trade could still occur. Despite the USA's overall technological superiority, its comparative advantage lies only in wheat, while the UK has a competitive forte in cloth. From the USA's viewpoint, the internal opportunity cost of acquiring a unit of cloth involves the sacrifice of two units of wheat. In the UK by contrast, the cost of a unit of cloth is equivalent to only one foregone wheat unit. Suppose that in the international arena, cloth and wheat are exchanged at a price ratio lying somewhere between each country's individual autarchic one, say at the rate of 1 cloth for 1.3 wheat.[1] Should the USA wish to acquire 1 cloth from its own industry, it would have to expend 4 labour units but if it availed itself of the opportunity of acquiring 1 cloth indirectly, by exporting 1.3 wheat, it need only deploy 2.6 labour units for that purpose. Likewise, in the UK, the option to obtain 1.3 wheat from its own farmers necessitates the use of 10.4 labour units whereas if that quantity of wheat were imported,

1

Figure 1.1
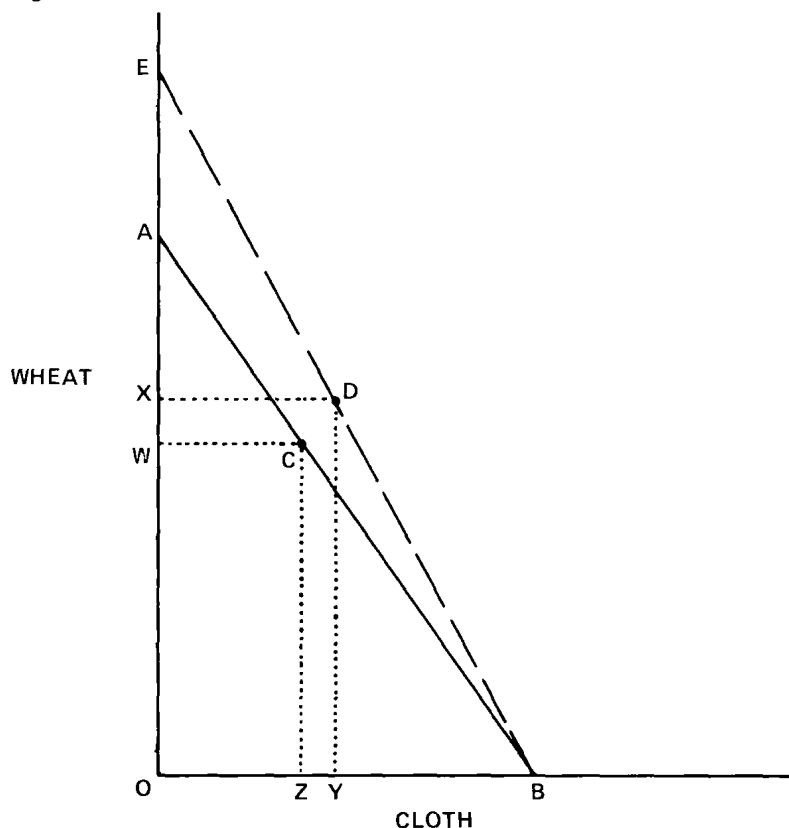
only 8 labour units need be employed in producing the 1 cloth required to finance wheat imports. Trade, by permitting both countries to economise on their resources, facilitates simultaneous living standard improvements.

The nature of the aforementioned trade gains can be highlighted iconographically with the use of simple co-ordinate geometry. In Figure 1.1, **AB** represents the production possibility curve of a certain country. Reflecting the constant cost assumption, it is a perfectly straight line whose slope is derived from prevailing labour output ratios, and whose position is governed by the overall size of the workforce. Given full employment, output produced is indicated by some point on the line such as C, involving OZ of cloth and OW of wheat. If, subsequently, an opportunity to engage in world trade at prices indicated by the slope of the broken line emerges, production may shift

from C to B, involving complete cloth specialisation.[2] In this event, YB of cloth may be exported for YD of wheat to obtain a consumption bundle shown by point D, which represents a larger combination of both commodities compared with the one depicted by point C. Trade gains arise from the fact that the country is enabled to consume aggregate amounts of goods which it is itself incapable of directly producing. Before trade, the country's consumption options were restricted to points along AB, its production possibility curve, but with trade it can consume somewhere along BE, the international exchange curve, and therefore consumption and production points need no longer converge. Consequently, the trade gain potential depends on the extent of the divergence between rates of transformation in production (the slope of AB) and foreign rates of transformation in exchange (the slope of BE). The larger this divergence, the larger are the country's trade gain possibilities.

If the source of trade gains lies in a discrepancy between local and foreign prices, the source of that discrepancy in turn can be traced to international differences in relative labour productivities. In a two good model, demand has no bearing on internal price formation and on determining which good is to be exported. It is of course significant in influencing world prices and trade volumes. When however, the model is extended to a multi-good one, it still remains true that exports all embody lower labour to output ratios than do imports but demand now becomes crucial in determining the cut off point between the two.

A major drawback of the classical model is its one factor assumption. It has been suggested that this was merely intended didactically to illustrate the gains from trade, and that a careful reading of Ricardo reveals that a multi-factor economy was not necessarily precluded.[3] Even so, the classical theory could still be faulted for not posing the question of what might become of the source of comparative advantages if knowledge and skills were to be universalised, thereby eroding the basis for inter-country production function differences.

The Heckscher–Ohlin Theorem

Within the past few decades, the ideas of Heckscher and Ohlin superseded those of Ricardo and have since become synonymous with modern trade theory. By contrast with Ricardian doctrine, the Heckscher–Ohlin (H/O) model assumes two production factors and an internationally uniform production function for each of two industries,

the qualities of factor inputs and state of the technical arts being every-where the same. In these circumstances, trade can no longer be regarded as being determined by inter-country differences in relative factor efficiency, instead, relative factor supplies become crucial. This appears evident in noting that the H/O theory's most significant prediction is that a country will export the good that is relatively intensive in the use of its relatively abundant factor.[4] If a country happens to be labour abundant, and if cloth happens to be labour intensive, then that country would export cloth. In a two factor model, relative factor intensity is indicated by the comparative ratio of the two factors (labour and capital) employed by each industry at any set of common factor prices. Relative factor abundance is a little more ambiguous. It can be ascertained by comparing ratios of factors of production measured in physical units, so that if $KI/LI > KII/LII$, country I is capital abundant ($K + L$ being total quantities of capital and labour, the numerals referring to the corresponding countries) or by relative factor prices, so that if $PKI/PLI < PKII/PLII$ (P standing for price), country I is once again, capital abundant. Only if factor abundance is defined in price terms, are the H/O predictions assured, given of course the maintenance of all crucial assumptions, which, apart from those already alluded to, include: perfect competition, internal but not international resource mobility, full employment, linear homo-geneous production functions and an absence of transport costs or other trade impediments. Sometimes, similar if not identical inter-country taste patterns are also included. In general, all significant differences, except for those pertaining to relative factor endowments, are assumed away. This is done to highlight the significance of relative factor supplies as trade determinants, and for this reason, the H/O model is also known as the factor proportions theory.

That the H/O's postulates are readily derived from the above-men-tioned assumptions, can be seen with the aid of Figure 1.2, in which ww and cc depict the respective isoquants of one unit of wheat and cloth.[5] Within country I, the slope of line AB reflects pre-trade factor costs which will induce product maximising entrepreneurs to produce units of wheat and cloth with input combinations indicated respectively by points E and F. Capital to labour ratios in each industry can be gauged by comparing the slopes of rays from the origin through points E and F (not drawn) which would reveal that wheat is relatively capital intensive. If the unit production costs of each commodity are expressed solely in terms of capital, then both would be equally assessed at OA, with the opportunity cost of 1 wheat equalling 1 cloth.[6] Now assume

Figure 1.2
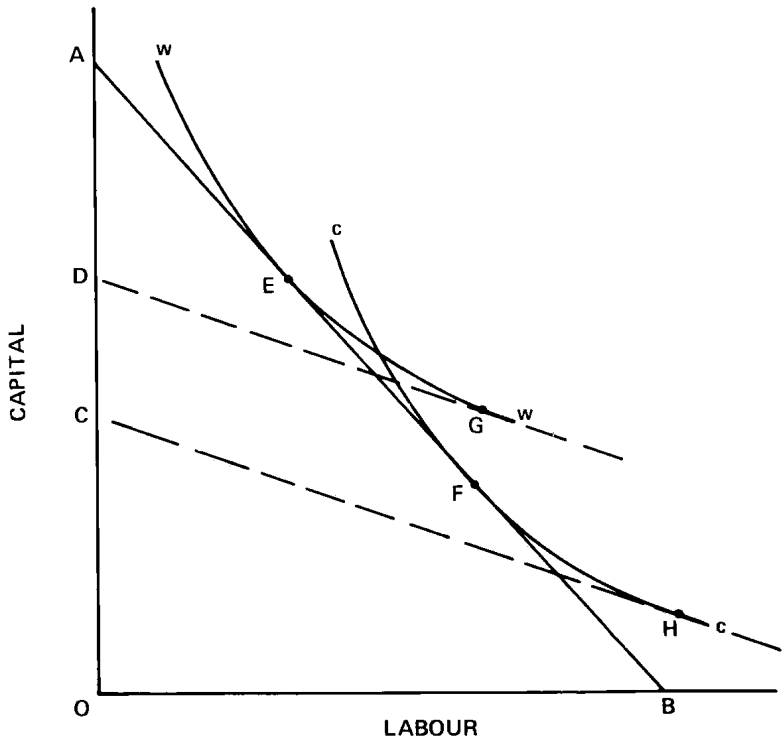
that in country II factor prices are equal to the slope of the broken parallel lines.[7] In this event, the production of one unit of wheat and cloth commands input combinations shown by points G and H, which when valued in terms of capital amount respectively to OD and OC. Since OD > OC, a unit of cloth is cheaper to produce than a unit of wheat, so that bearing in mind the other country's cost ratio, country II would be competitive in cloth and would be inclined to import wheat. [cost of wheat in I/cost of cloth in I < cost of wheat in II/ cost of cloth in II]. These results accord with the H/O theory. PKI/PLI < PKII/PLII (line AB is steeper than the broken parallel ones) therefore country I is capital abundant and, as already noted, is likely to export its capital intensive item wheat; similarly, labour abundant country II would export labour intensive cloth.

Within its two factor, two good, two country framework, the H/O model is remarkably neat and precise. Unfortunately, such clarity is gained through the maintenance of what many may regard as an unreasonable set of assumptions. Granted that a theory's predictive power

is the touchstone by which it is adjudged, it can still be argued that the H/O model's general usefulness has been vitiated for the sake of analytical rigour. Trade theorists spellbound by the model's elegance and locked into its assumptions have expended prodigious efforts in refining it further. Generations of scholars engrossed in non-operational issues (such as the factor price equalisation theorem) and in otiose welfare considerations, have bequeathed to countless students a very narrow and constricting account of trade determinants. Rigid adherence to what has come to be more aptly described as the H/O–Samuelson theory, forestalled widespread and serious contemplation of the impact on trade of non-competitive markets, product differentiation, economies of scale, multinational corporations, transport costs, industrial location, unemployment, taxes and subsidies, internal factor immobility, money costs and prices, to name but a few factors which common sense would suggest are of relevance. As incredible as it may seem, Ohlin himself actually did take such considerations into account delving into them quite deeply (especially in his work's second edition)[8] affording ironically one of the finest critiques of his much parodied theory. Although Ohlin believed that relative factor proportions are extremely significant in explaining trade flows, he stressed the importance of treating them as but one among many ingredients in a general interdependent model. Since his finer views have habitually been overlooked,[9] it would not be amiss to highlight some of them.

As far as Ohlin was concerned, trade models which do not explicitly incorporate location theory could not adequately explain world trade flows. The question that would-be investigators were invited to pose was not simply why certain countries exchange certain goods but why production is divided among them in a certain way, for in general 'the exchange of goods is determined once the location of production has been fixed'.[10] In this regard, transport costs are crucial and are to be considered not simply as trade inhibitors (the role assigned to them by contemporary economists) but in many instances as trade determinants. To illustrate this point, comparative reference was made to the UK's and the USA'a iron and steel industries, which in the early part of this century were located in regions which involved average haulage distances in attaining necessary inputs and then delivering the steel output to a port of shipment of 30 and 500 miles respectively.[11]

Weight was also attached to the influence of scale economies,[12] for even if factor proportions between countries were originally identical, Ohlin believed that trade could still be profitable if 'the market for some articles within each region is not large enough to permit the most

efficient scale of production'.[13] In such circumstances, the specific industries in which countries specialise may be selected on an aleatory basis but upon their establishment, unique demand patterns for factor inputs are likely to emerge, leading to inter-country differences in factor prices thereby providing an additional basis for specialisation. In practice, Ohlin felt that, initially, factor prices were likely to diverge, and that scale economies would complement trade advantages derived from differing factor proportions. However, when the additional impact of both scale economies and transport considerations is acknowledged 'conclusions are reached regarding the location of production and the character and effects of international trade that *deviate considerably* from those that would have been arrived at if only the scarcity of the factors of production has been taken into account'.[14]

The role of innovation, technology and skill differentials was also stressed. Ohlin realised that certain manufactured goods were exported from the US 'simply because by chance some inventions originated there and sustained effort maintained technical superiority'.[15] As for skills, 'a few engineers in one country may have a special knowledge of a particular technical process and may for that reason be able to produce more cheaply than other countries'.[16]

Upon exploring the consequences of relaxing the product homogeneity assumption, it was conceded that issues of 'goodwill, trademarks, exclusive selling rights given to a number of retailers etc.'[17] would be pertinent, and in reference to product differentiation, the phenomenon of intra-industry trade (which only began to receive widespread attention from the early 1970s) was clearly identified. As noted by Ohlin, intra-industry trade was partly due to transport factors and partly due 'to the fact that the imported and exported commodities are of different quality. For instance, before World War I Denmark imported butter from Siberia and exported Danish butter to Great Britain, because of the marked difference in taste. *A study of international trade statistics reveals many similar cases*.'[18]

Endorsing Linder's hypothesis (reviewed below) Ohlin declared that 'the volume of trade is dependent upon the absolute quantity of productive agents in the various regions, not upon the inequality of their endowment'[19] and that 'the best clients of leading manufacturing countries are the other manufacturing countries'.[20] What is more, in relation to trade between industrial and Third World countries we are cautioned to take into account qualitative factor differences as well as differences in public administration, political stability and legal security.[21]

Hopefully, the above discussion absolves the H/O theory's co-founder from responsibility for the model's degeneration into relative aridity.

While qualms about the H/O model's limitations have intermittently been voiced, only fairly recently have serious attempts been made either to construct alternative hypotheses, or to place the theory in proper perspective as just one important but not exclusive trade explanator. An approach typically adopted has been one of attempting to redress glaring deficiencies by modifying the model ever so slightly. In this respect, Bhagwati's strictures are fairly representative.[22] Lamenting that the model had not (at the time he was writing) been extended to a multi-country and multi-commodity framework, Bhagwati envisaged various ways in which a multi-country assumption could be accommodated. Factor proportions could be compared between a given country and the rest of the world, between a country and all its direct trading partners, between a country and all its direct plus indirect trading partners, or between a country and each of those in direct trade with it 'so that the H/O hypothesis would hold for each pair of countries bilaterally'.[23]

With regard to the previous statement, Baldwin maintained that in a multi-country setting, where all goods are traded, the number of products exceeds the number of factors and factor-price equalisation is realised, then although the H/O model would apply for a country's total trade, it 'need not hold on a bilateral basis'.[24] Unfortunately, Baldwin furnished inadequate proof in support of this proposition. A geometric illustration showing how it is possible for say a capital abundant country to import a capital intensive good from a relatively labour abundant partner, while yet globally speaking being a net capital exporter, was provided. Nevertheless, the diagram in question is more akin to a flow chart, indicating the mechanical possibility of bilateral trade diverging from H/O outcomes, with overall trade conforming. What is lacking is an account of the economic bases, motives or incentives for such bilateral trade. Later, Baldwin concurred that in the event of non-factor-price equalisation, the H/O theory would 'hold between any pair of countries', although not necessarily between a given country and all its trading partners.[25]

Baldwin's statement was based partly on work by Caves and Jones whose rather neat and innovative exposition is worth summarising.[26] Assume that a country incapable of influencing world prices produces a number of different products whose representative isoquants are shown in Figure 1.3. Each isoquant depicts alternative input combinations that

Figure 1.3
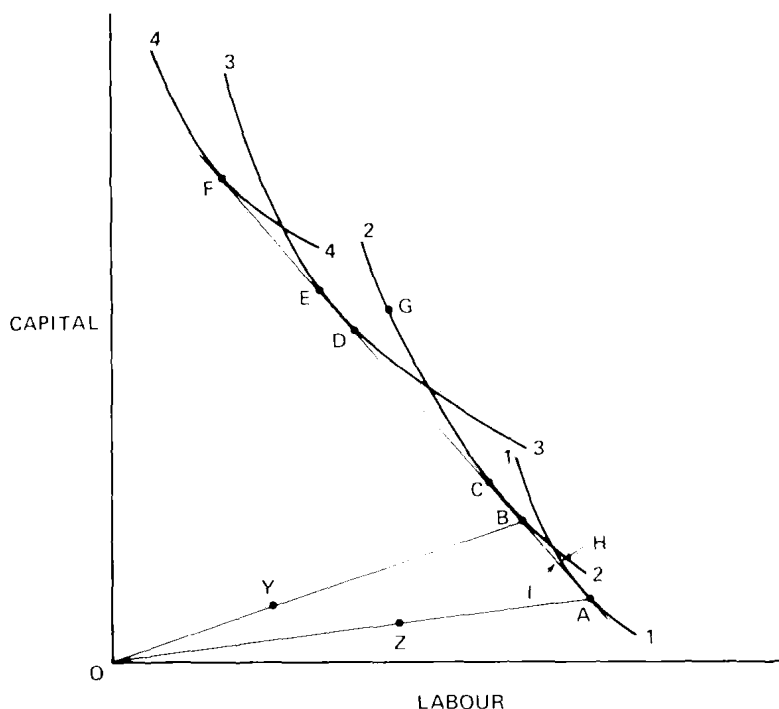
yield products all worth $1 in the international market. At prevailing prices, some points on each isoquant would be economically unattractive. Such a point for instance, would be G on isoquant 2, on the grounds that if, instead, good 3 was produced with inputs represented by point D, involving less of both inputs, good 2 could be obtained indirectly by trading good 3. Similarly, point I is economically preferable to point H even though I is not on an isoquant below H. I in fact indicates an output mix of both goods 1 and 2. Assume that 60 per cent of good 1 is produced with factors in ratios indicated by the slope of ray OA and that Z lying 60 per cent along OA (from O) portrays the actual amounts of factors involved. Now let 40 per cent of good 2 be produced by combinations of capital and labour shown by point Y. The linear combination of vectors OY and OZ is OI (not drawn). It should now be apparent that points along line AB represent varying fractions of goods 1 and 2 which, in combination, yield $1. Likewise, lines DC and EF depict alternative mixes of goods 2 and 3, and 3 and 4. The lines AB, CD and EF are all tangent to the sets of isoquants they

are connecting. If the country's relative factor endowments are indicated by the slope of a ray projecting from O to a point between D and E (not drawn) the country would specialise in good 3 importing the relatively more labour intensive goods 1 and 2 (from more abundant labour sources) and the relatively more capital intensive good 4 (from a more capital abundant country) violating the H/O theory in terms of the country's aggregate though not bilateral trade.

Two versions of the H/O theory have been forthcoming. The first, identified by Baldwin as the 'commodity' version, suggests that a country will export those goods which intensively use its relatively abundant factors. This version is the most widely known and utilised. The second, the 'factor-content' version, 'states that a country will be a net exporter of its relatively abundant factors in the sense that the amounts of these factors embodied in its commodity exports will be greater than the quantities embodied in a representative bundle of import-competing commodities'.[27] This version is said to apply in a multi-country, multi-commodity framework irrespective of whether or not factor price equalisation occurs.

During the 1950s investigations by Leontief indicated that the USA's exports were more labour intensive than its import competing goods. These findings generated numerous forays in attempting either to reconcile Leontief's results with the reigning H/O model, to account for them in terms beyond the model's assumptions or to confirm or confute Leontief's empirical work by replicating it both in the US and elsewhere. The 'Leontief paradox', which will be more extensively treated in the next chapter, undoubtedly created much scepticism with regard to the H/O model and encouraged progress towards its modification. One type of reaction, for example, involved the decomposition of capital into physical and human components, with the contention that when the relative skills of US workers are taken into account, US exports are manifestly more capital intensive than are US imports.[28]

Intra-industry Trade

The general malaise over the capabilities of the H/O model was heightened with increasing observations of intra-industry trade, defined as the 'value of exports of an "industry" which is exactly matched by the imports of the same industry'.[29] On the basis of 1967 trade flows, Grubel and Lloyd estimated that 48 per cent of the average unweighted trade of eleven major industrial countries consisted of intra-industry