Chapter 8
The Precursors

In this chapter we give a brief treatment of the precursors to the new explanations for international trade.

8.1 Availability

According this approach, due to Kravis (1956), international trade is explained by the fact that each country imports the goods that are not available at home. This unavailability may be due to lack of natural resources (oil, gold, etc.: this is *absolute* unavailability) or to the fact that the goods cannot be produced domestically, or could only be produced at prohibitive costs (for technological or other reasons): this is *relative* unavailability. On the other hand, each country exports the goods that are available at home.

Now, as regards the presence or absence of natural resources, this aspect could easily be fitted into the Heckscher-Ohlin model that, as we know, stresses the differences in relative factor endowments. We only have to add a factor *natural resources* (and, indeed, this has been done: see the discussion of Leontief's paradox in Sect. 4.6; for a general treatment of natural resources see Kemp & Long, 1984) and use the generalized version of the model (see Sect. 20.4)

The originality of this approach lies in its second aspect, that is, in the reasons put forward to explain international differences in relative availability. Essentially there are two reasons: *technical progress* and *product differentiation.*

As regards the first reason, Kravis observes that the stimulus to exports provided by *technological change* is not confined to the reduction in costs (in which case we remain in the context of the traditional theory) but also includes the advantages deriving from the possession of completely new products and of the most recent improvements of existing types of goods. In such cases the operation of the *demonstration effect* of Duesenberry (1949) creates an almost instantaneous demand

abroad for the products of the innovating country and thus generates international trade.

As regards *product differentiation,* the idea of Kravis is to extend to international trade the results of the theory of monopolistic competition. Different countries produce similar commodities or, more exactly, commodities that are not substantially different from the point of view of their intended purpose (clothes, automobiles, watches, cameras, cigarettes, liqueurs, etc.). These commodities, however, due to different industrial designs, past excellence, advertising, real or imaginary secondary characteristics and so on and so forth, are *considered* different by consumers. This creates, on the one hand, a more or less limited monopolistic power of the single producing countries, and on the other a consumers' demand for foreign commodities that they believe different from similar domestic commodities, the result being to create international trade.

8.2   Technology Gaps

The advantage enjoyed by the country that introduces new goods, already considered by Kravis as one of the elements of his availability approach, is focused on by other authors (Hufbauer, 1966; Posner, 1961). As a consequence of research activity (especially of the Research & Development type) and entrepreneurship, new goods are produced and the innovating country enjoys a monopoly until the other countries learn to produce these goods: in the meantime they have to import them. Thus, international trade is created for the time necessary to imitate the new goods (*imitation lag*).

This lag has several components, that Posner (1961) classifies (from the point of view of the importing country) in the following categories:

(a) *Foreign reaction lag*. This is the time between the successful utilization of the innovation by entrepreneurs in the innovating country and the new goods becoming regarded, by some firms in the importing country, as a likely competitor for their products.
(b) *Domestic reaction lag*, which is the time required for all firms in the importing country to become aware of the competition from the new good.
(c) *Learning period*, which is the time required for the importing country's firms to learn to produce the new good, and actually produce and begin selling it on the domestic market.

According to Posner, to get the total net lag, one should subtract from the imitation lag a *demand lag*, that is, the time elapsing between the introduction of the new good in the innovating country and the appearance of a demand for it in other countries (some time elapses before the other countries' consumers come to know of the new good and acquire a taste for it). Imports of the new good will therefore take place only in the period of time resulting from the difference between the imitation lag and the demand lag. Contrary to this subtraction one may argue that

it is consumers demand that stimulates the imitation by the firms of the importing country, so that the imitation lag starts from the moment in which demand appears; it is therefore incorrect to subtract the demand lag. This is however a unessential problem.

Once the imitation has been successfully performed, imports by the imitating country tend to cease, but as there is a *flow of innovations* through time, this aspect of international trade perpetuates itself. Besides, the imitation lag has not the same length in all countries, so that even if one or more countries successfully imitate new good, the innovating country will have an advantage in other countries, where the imitation lag is longer thanks to its greater experience in producing the good.

With reference to this, Posner defines the *dynamism* of a country as a function of its flow of innovations (that is, the number of new goods that it successfully introduces per unit of time) and of the speed with which it imitates foreign innovations.

When, in a two-country model, one is much more dynamic than the other, the less dynamic country will have to pay for its imports of new goods by exports of traditional goods at less and less favourable prices, and thus will not be able to carry out the massive investment (so as to modernise plants, etc.) required to increase its own dynamism. In other words, the less dynamic country remains trapped in its low level of dynamism.

On the contrary, when various countries have a very similar dynamism, international trade can stimulate a general growth process thanks to the fact that the innovations introduced in any country are rapidly imitated by the others. According to some authors, this is the phenomenon that occurred in the "golden age" of the European Economic Community (now European Union).

8.3   The Product Cycle

According to this theory, due to Hirsch (1967, 1975) and Vernon (1966, 1979), in the life cycle of a product it is possible to distinguish various phases: the *introduction* of the new good, its *maturation,* and its *standardization*, which together constitute the product cycle, with important effects on international trade.

The starting point is that equal *access* to scientific principles in all the advanced countries does *not mean equal probability of the application* of these principles in the production of new goods. According to Vernon (1966, p. 192), in fact, there are good reasons (for example, information costs) to believe that entrepreneurs' ability to get to know of new opportunities and to respond to them is a function of ease of communication with the market, which in turn depends on geographical proximity. As a consequence, firms generally introduce new products which are likely to satisfy the demand of the national market in which they sell. In the first phase, then, the production of the new good will be located in the country where the innovating firm operates, and the domestic market will be served.

When the new product has gained a hold upon the domestic market, the producer will begin to get into foreign markets, initially by exporting the good to them. In this phase of *maturation* the motives underlying the initial location disappear, and the firm will begin to examine the best way of serving foreign demand. On the one hand, the firm can continue to produce all the output at home and export the amount demanded abroad. On the other, the firm can licence foreign producers, or directly engage in producing the good in plants located in foreign countries where a demand exists; in this phase, the countries concerned will usually be advanced countries.

According to Vernon, in the case of new goods the licensing alternative is an inferior choice due to the inefficiencies and imperfections in the international market for technology (patents, licences, etc.). The firm having a monopolistic power thanks to the introduction of the new good will try to exploit this power also by way of price discrimination. As it is usually impossible to satisfy the conditions for optimal discrimination by using licences, to produce on one's own (either domestically or abroad) is a superior choice. To choose rationally between producing for exports at home or setting up producing subsidiaries abroad, the firm will compare the marginal cost of producing for exports at home, augmented by transport costs and tariffs (if any) levied by importing countries, with the unit cost of producing in a foreign subsidiary. A possible triggering event that induces the firm to set up a subsidiary abroad is the appearance in the foreign importing countries of local producers of the good. Another important element is the danger that the governments of importing countries, to protect their industries, may impose rigid restrictions such as quotas on the imports of the new product.

In the second phase, therefore, it is likely that the innovating firm will set up producing subsidiaries abroad, in developed countries. Thus, the export from the innovating country to these countries will dwindle away to zero, whilst it will continue to export to developing countries.

Finally, in the third phase of the cycle, we have advanced *standardization* of the good, hence the central, if not exclusive, importance of the cost of production in determining profitability. In this phase it may become advantageous to locate production units in less-developed countries because of the low cost of labour there. It may seem strange that this advantage makes itself felt also in the case of capital-intensive goods, but a less-developed country may offer competitive advantages as a location for the production of these goods, because the cost of capital may be less important than other factors (e.g., the marketing of the product, or such a low cost of labour to more than offset the greater capital intensity).

In the third phase, according to Vernon, in the country where the commodity originated, production dwindles whilst demand keeps increasing, so that this country gradually becomes an importer of the commodity, from other industrialised countries to begin with, then from less-developed countries.

The product cycle model also implicitly offers an explanation of the localization of production in different parts of the world and of the changes in this localization, hence it can also be considered as a precursor of the 'economic geography' models (see Sects. 16.3–16.5).

8.4   Income Effects

We examine here the theories which first focused on demand and income, among which are the theories of Linder (1961) and Barker (1977).

8.4.1   Linder's Theory

According to this theory, while the Heckscher-Ohlin theory is well suited to explain the pattern of trade in primary goods and, generally, in products intensive in natural resources, it is inadequate to explain the pattern of trade in manufactures. The alternative theory that he suggests starts from the concept of *potential trade* (potential exports and potential imports) of a country.

Potential exports are determined by domestic demand. More precisely, Linder's basic proposition (Linder, 1961, p. 87) is this: a necessary (albeit not a sufficient) condition for a product to be a potential export is that this product should be used as a consumption or an investment good in the home country. i.e. that a "representative" domestic demand for the product exists. Representative means that the product should be generally demanded. For example, although there is a demand for Ferraris, Rolls and Cadillacs in Saudi Arabia, this is not a representative demand and so it cannot turn luxury cars into potential export goods for Saudi Arabia.

Three main reasons are given by Linder to support his proposition:

1. It is unlikely for entrepreneurs to undertake the production of goods for which there is no domestic need;
2. Even if the existence for such a need abroad were perceived by entrepreneurs, they may be unable to conceive the product that will suit this need;
3. Even if this product were conceived, it is unlikely that it could be adapted to unfamiliar conditions without additional prohibitive costs.

This amounts to saying that, contrary to Heckscher-Ohlin theory, production functions are not internationally identical but that, for the entrepreneurs of a country, the production functions of commodities domestically demanded are the most advantageous. In other words, all this amounts to what businessmen call "the support of the domestic market".

As regards *potential imports*, it is domestic demand that determines which commodities may be imported (obviously this demand need not be representative). It follows that the range of potential exports coincides with, or is a subset of, the range of potential imports.

From this basic proposition it follows that the more similar the demand structures of two countries are, the more intense the potential trade between them will be. As an index of this similarity Linder takes the *similarity of per capita income levels*, since, in his opinion, there is a strong relationship between per-capita income and the

types of commodities that demanded: for example, as per-capita income increases, higher-quality consumer goods will be demanded.

So far we have dealt with potential trade; we must now examine the forces that cause *actual* trade. Let us begin with an extreme case, in which two countries have identical per-capita income and so identical potential trade, for the potential exportables and importables are the same in both countries. Why then should there be (actual) trade between these countries? The answer is simple. When entrepreneurs broaden their horizons to the international market, they discover that they can expand into each other's country thanks to *product differentiation*. As Linder (1961, p. 102) remarks, "the almost unlimited scope for product differentiation—real or advertised—could, in combination with the seemingly unrestricted buyer idiosyncrasies, make possible flourishing trade in what is virtually the same commodity".

As regards countries with different per capita income, it is plausible to think that the same forces are at work, with the difference that the number of commodities for which the demands overlap will be lower and so actual trade will also be lower.

It goes without saying that growth induces increases in the per capita income of a country and so the structure of demand changes. As a consequence, the range of potential exports (and so of actual exports) is changing through time in a gradual and predictable way: "If Japan has been an importer of cars and exporter of bicycles, she might, within a decade, export cars and import bicycles" (Linder, 1961, p. 106). This is a prediction that hit the nail on the head.

Side by side with the forces that foster actual trade, there are forces that put a brake on it, for example distance (which comes into play in the form not only of transport costs, but also of other elements such as the imperfect knowledge of faraway markets), tariffs and other impediments to trade. Therefore, the braking forces will make actual trade—which, in their absence, would coincide with potential trade—smaller than the latter.

It is important to stress, in conclusion, that in Linder's theory it is the *similarity in demand* that generates trade (in similar but differentiated products): the greater the similarity the more trade there is, contrary to the traditional theory where one of the causes of trade is the *difference* in preferences (see Chap. 3), and the volume of trade increases as the economies become more dissimilar. For a re-examination of this idea see Economides (1984); for empirical tests of Linder's theory see the survey by Deardoff (1984), Eltis (1983), Kleinman and Kop (1984), and Hanink (1990).

8.4.2   Barker's Variety Hypothesis

Barker (1977) puts demand at the centre of the picture and acknowledges the contributions of Linder and other authors, but observes that these do not come to grips with the fact that trade grows *more than proportionally* to income. He therefore

formulates the *variety hypothesis*, according to which consumers love variety, and so "as real incomes increase, purchasers are enabled to buy more varieties of a product; and since a greater number of these extra varieties is available from abroad rather than at home, the share of imports in demand tends to increase. Taking imports as a whole the quantity of imports in demand tends to increase more than proportionally with real income *per capita*" (Barker, 1977, p. 155).

The variety hypothesis starts from the theory of demand based on the *characteristics* of goods. As we cannot fully explain this theory here, we shall only recall its general principles, and refer the reader to its author (Lancaster, 1966, 1971).

According to this theory, the consumer actually desires the characteristics of the goods available, rather than the goods themselves. Characteristics are defined as "those objective properties that are relevant to choice by people" (Lancaster, 1971, p. 6). Thus the consumer purchases the good to obtain the characteristics embodied in them. To make an example, the consumer does not desire the commodity "automobile" as such, but desires a set of characteristics such as safety, fuel consumption, comfort, colour, acceleration, braking, steering, prestige, speed, etc., embodied in varying degrees in the various automobiles available on the market.

The first step in the consumer's choice is to find the *efficient* set of goods, that is, the set of goods which are not dominated by any other good. A good is dominated by another when, at the same price, it contains a lower amount of at least one characteristic and no higher amount of any characteristic.

The choice within the efficient set of goods will then be made on the basis of the budget constraint and of the utility function of the consumer; the arguments of this function are, as we said, the characteristics not the goods.

This said, Barker adds a series of assumptions (the goods are produced and can be purchased in several countries; there are transport costs, etc.) and demonstrates various propositions, amongst which (Barker, 1977, p. 160):

(a) There will be international trade in any tradeable good, since foreign goods will contain combinations of characteristics preferred by some buyers.
(b) The volume of trade in a set of goods having similar combinations of characteristics increases as per-capita real income increases, because the higher spending possibilities (relaxation of the budget constraint) enable consumers to buy more of the available goods.
(c) Up to the point of saturation, as per-capita real income increases, the purchase of imported goods increases by more than the purchase of analogous goods produced at home.

From these propositions, in particular from (c), Barker shows, by aggregating, the validity of the variety hypothesis formulated at the beginning. For empirical tests of the variety hypothesis see Barker (1977) and Vori (1984).

Table 8.1 Example of SITC classification

Digits	Items
8	Miscellaneous manufactured articles
…	…
85	Footwear
851	Footwear
…	…
851.01	Footwear with outer soles and uppers of rubber or artificial plastic material
851.02	Footwear with outer soles of leather or composition leather; footwear (other than footwear falling within heading 851.01) with outer soles of rubber or artificial plastic material

8.5 Intra-industry Trade or, the Traditional Theory Strikes Back

Let us recall from Sect. 7.1 that intra-industry trade is defined as the simultaneous export and import of products belonging to the same industry, which gives rise to an exchange of goods within, rather than between, industries. The empirical studies (see, e.g., Kol & Tharakan, 1989; Tharakan, 1983; these studies also describe the indexes used to measure intra-industry trade) show an increasing quantitative importance of this phenomenon.

Now, it is often alleged that the traditional theory cannot explain intra-industry trade which, on the contrary, is the normal outcome of the new trade theories. Hence an alleged superior explanatory power of the new theories. This claim is ill-founded, since—as shown both by precursors (Grubel & Lloyd, 1975) and by more recent writers (Davis, 1995)—intra-industry can be accounted for by the traditional theory.

To begin with, it should be observed that—apart from problems of physical homogeneity, which will be dealt with presently—internationally traded goods are usually classified in categories according to the Standard International Trade Classification (SITC) issued by United Nations (1975). This classification starts from a limited number of very broad basic classes, distinguished by *one* digit: for example, Sect. 1 is "Beverages and Tobacco", Sect. 8 is "Miscellaneous Manufactured Articles". Within each of these, more detailed categories are distinguished by *two* digits; each two-digit category is in turn disaggregated into various *three*-digit categories, and so on up to *five* digits. It should be noted that SITC, as internationally adopted, arrives at five digits; for further disaggregation, the individual countries are free to choose their own description and coverage. In practice the maximum disaggregation used arrives at seven digits (an example is 851.02.07 – Sand shoes, rubber-soled—see Grubel & Lloyd, 1975, pp. 19–20). It is clear that the higher the number of digits of an item the more precisely defined the set of similar goods included in that item. In Table 8.1 we give an example of the SITC classification, in which we have considered only a few disaggregations.

Obviously, if one considers the two-digit items only, the phenomenon of intra-industry trade is not a surprise, for we are dealing with classes so broad as to include heterogeneous goods.

Intra-industry trade would then be a spurious phenomenon, due to statistical aggregation. But since intra-industry trade is also observed in higher-digit items (Vona, 1990), even going as far as the seven-digit ones, it cannot be neglected from the theoretical point of view. Grubel and Lloyd were among the first systematically to examine the problem (Grubel, 1967; Grubel & Lloyd, 1975). From the theoretical point of view we must distinguish between the case of *identical* goods and the case of non-identical (though belonging to the same industry) goods.

8.5.1   Perfectly Homogeneous Goods

In the case of identical goods the traditional theory can supply various explanations, the oldest being that of transport costs (see Sect. 6.3). A second explanation is given by what Grubel and Lloyd call *periodic trade*, which can be due to:

 (i) Seasonal factors. For example, country 1 and country 2 both produce the same summer fruit, but they lie at the antipodes, so that when it is summer in country 1 this country will export summer fruit to country 2 where it is winter, and vice versa. Thus we shall observe intra-industry trade on a yearly basis. This can be easily fitted in the traditional theory, by assuming transformation curves that periodically change their position.
(ii) Varying conditions of demand. For example, it is normal that neighbouring countries exchange electrical power with one another to meet demand peaks in one or another country. This can also be fitted into the traditional theory, by assuming demand curves that periodically change their position.

A third explanation refers to the import and export of goods after mere storage and wholesaling (*entrepôt trade)* or after simple manipulations (such as packaging, bottling, cleaning, sorting, etc.) which leave the goods essentially unchanged (*re-export trade*) . Even in the case of re-export trade the manipulations are usually not sufficient to warrant the reclassification of the goods in a different SITC class, so that intra-industry trade is observed.

A fourth explanation refers to the effects of government intervention. Let us assume, for example, that in a three-country world countries 1 and 2 join a free trade area and country 2 levies higher duties against country 3 than country 1 does. It may then be advantageous for country 3, in order to export a good to country 2, first to export the good to country 1 and so pay a lower tariff, and then re-export it to country 2 as coming from country 1, thus paying no further duties. Country 1 will then appear as an importer and exporter of the same commodity.

To conclude: intra-industry trade in perfectly homogeneous goods can be quite well accommodated by the traditional theory. But what about differentiated products?

8.5.2   Differentiated Products

As soon as we drop the traditional assumption of product homogeneity, the presence
of intra-industry trade in products which are sufficiently similar to belong to the
same SITC category but have some degree of differentiation, becomes a necessary
consequence. As a matter of fact, *all the theories treated in* Sects. 8.1–8.4, *which
consider product differentiation an essential element of trade, can be used to explain
intra-industry trade.*

To examine intra-industry trade in differentiated products, it is convenient to
follow a classification introduced by Grubel and Lloyd (1975) , based on similarity
of input requirements and substitutability in use.

The *first group* contains commodities with similar input requirements but low
substitutability in use, such as bars and sheets of iron.

The *second group* includes commodities with low similarity in input
requirements but high substitutability in use, such as wood and plastic chairs.

The *third group* contains commodities with similarity in input requirements and
high substitutability in use, such as cars with similar characteristics, but manufac-
tured by different producers.

It goes without saying that the group of commodities with low similarity in
input requirements and low substitutability in use does not come into consideration,
for these commodities belong to different SITC classes and no intra-industry trade
will be observed.

Intra-industry trade in commodities belonging to the first group can be explained
by the traditional theory, for their low substitutability in use makes them *different*
commodities from the point of view of demand. Intra-industry trade is simply a
phenomenon due to statistical aggregation.

Intra-industry trade in commodities belonging to the second group can also be
explained by the traditional theory, for the dissimilarity in their input requirements
means that they have to be considered as *different* commodities from viewpoint
of production: intra-industry trade is, again, a phenomenon due to statistical
aggregation.

We are left with the third group in which we may further distinguish two cases.

The first one is when the commodities are so similar (as regards both
input requirements and substitutability in use) that they can be considered as
homogeneous for all practical purposes, and we are back in the situation examined
in the previous section.

The second case is the relevant one: the commodities, though very similar,
have to be considered different from the economic point of view, because of
technological differences in production and/or because consumers believe them to
be different (for reasons of brand, design, advertising, etc.) even if they are perfectly
substitutable in use and with identical inputs (toothpastes or medicines with the
identical chemical composition are an example). At this point the market form
becomes essential.

If the differentiated goods are produced under constant returns to scale and the market remains perfectly competitive, then the traditional theory can again be invoked. In fact, a commodity which differs, however slightly, from another commodity from the point of view of production and/or demand can be formally treated as a different commodity (for example, two commodities that have identical factor proportions but even a slight Hicks-neutral productivity difference have to be classified as different commodities, though belonging to the same industry). And, as long as markets are perfectly competitive, we can apply the traditional theory in its generalization to *n* commodities (see Sects. 2.4, 3.7, and 20.4).

It should be emphasized that by "traditional theory" we do not mean solely the Heckscher-Ohlin model, but—as clearly stated in Sect. 7.1—all the theories examined in Part II, hence also the Ricardian theory. As we know (see Sect. 1.2), the Ricardian model emphasizes technical differences while the Heckscher-Ohlin model emphasizes factor endowments; both are firmly rooted in the perfectly competitive framework with constant returns to scale.

Now, commodity differentiation from the production point of view can arise from different factor proportions (Heckscher-Ohlin) and/or from different technologies (Ricardo), as we pointed out above. This is, in fact, the approach followed by Davis (1995) who, after defining "perfectly-intraindustry goods" as those goods that for all factor price ratios are produced under identical factor intensity (hence they are Heckscher-Ohlin identical), assumes that two such goods have a small Hicks-neutral productivity difference across the two trading countries (hence they are Ricardo different).

It is then no surprise that intra-industry trade can take place, which can coexist with inter-industry trade in a model (called by Davis a Ricardo-Heckscher-Ohlin model) in which there also are perfectly homogeneous goods (i.e., goods with absolutely identical production functions).

This result reinforces what we have repeatedly noted in this section on intra-industry trade, namely that this phenomenon can quite well be accommodated in the context of the traditional theory.

To conclude: increasing returns to scale (which are typically associated with imperfect competition and hence with the new theories of international trade, see Sect. 7.1) are not necessary to account for intra-industry trade. A conclusion that does not detract from the merits of the new trade theories, but puts the entire question into proper perspective: the traditional theory cannot be attacked (and the new theories cannot be praised) just on the basis of the inability or ability to explain intra-industry trade. The focus must shift on whether we are dealing with perfectly or imperfectly competitive markets, which is a factual rather than a theoretical question. It is comforting to know that international trade theory (both old and new) gives us the tools for coping with all market forms.

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