

# **INTERNATIONAL ECONOMICS (TRADE)**

**EC 357**

**Topic No. 5:**

## **“COMPARE AND CONTRAST THE HECKSCHER-OHLIN EXPLANATION OF TRADE AND THAT OF LINDER“**

this essay was written by:

**Stefan Ebler**

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## 1 Introduction

The history of economics, especially the history of international trade and international trade theories can be divided up into four main stages.

1. Mercantilism:
2. Classical Theories:
3. Modern Trade Theories:
4. New Trade Theories:

The modern trade theories were detailed and worked out by a number of economists. One of the most important works is the theory of Heckscher and Ohlin, called the *Factor Proportions Theory*. This theory was used as a fundamental basis for further explanations of international Trade like the work of Samuelson, Rybczynski, Leontief, Stolper, Linder<sup>1</sup>, ... . Especially Linder added some important thoughts, especially he incorporated the *role of demand*. This was an important prework for the (later) *intra-industry theory*<sup>2</sup>.

In the next chapter, the Heckscher-Ohlin-Model will be explained and some of the 'problems' with this theory will be outlined.

One attempt to 'solve' this problems is the approach of Staffan Linder which will be described in chapter 3.

Finally (chapter 4) the theory of Heckscher-Ohlin will be compared and contrasted to the 'additional' work of Linder.

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<sup>1</sup> a good overview is given in: Ethier, Wilfried J. Modern International Economics, Norton & Company, 1995

<sup>2</sup> see: Grubel and Lloyd, Intra-Industry Trade, 1975

## 2 The Heckscher-Ohlin-Model

The most simple and basic of all theories dealing with the patterns of trade is, of course, the observation that a country will export goods, which can be produced domestically at lower costs than in other countries; and that it will import goods which can be produced only at higher costs at home. So one important question is *why prices differ*. One attempt to explain this is the model of Heckscher and Ohlin. This model has served as the backbone of traditional trade theory for almost 60 years, even if there are several ‘problems’ about it. Before I outline the basics of this theory, I will mention the fundamental assumptions, because there will be several links to these assumptions during the further work.

### 2.1 The basic assumptions

Even if there are given different possibilities to cluster these assumptions in different books<sup>3</sup>, the main content remains the same. These are<sup>4</sup>:

1. There exist two goods, two factors of production and two countries (a so called 2 x 2 x 2 model of trade).
2. Each country faces identical production functions, that is the proportion of the various factors required to produce a certain good are the same in all countries.
3. All countries enjoy equal access to the same body of technological knowledge; any new knowledge about how to produce a certain product is instantly diffused internationally.
4. All factors of production are perfectly mobile within countries but immobile between countries.
5. Both product markets and factor markets are assumed to be perfectly competitive.
6. Transport costs are non-existent.
7. There exist no tariff or other barriers to trade.
8. Products are homogenous, that is there is no product differentiation.
9. Consumer preferences are assumed to be identical in all countries.

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<sup>3</sup> e.g.: Grubel and Lloyd, *Intra-Industry Trade*, 1975 p. 71;  
Ethier, Wilfried J. *Modern International Economics*, Norton & Company, 1995, p. 125/126 ;

<sup>4</sup> Grimwalde Nigel, *New Patterns of Trade*, 1989, p. 11

To be able to handle the theory, Heckscher and Ohlin made the above given assumptions, (even if this assumptions are not very realistic). So they restricted their view on two countries, two factors and two products (see: assumption 1).

Most of the assumptions can be taken as they are given above (No. 1 - 7) because their relaxation would not change the estanciell outcome of this theory; especially with regard to the topic of this work<sup>5</sup>. The important question is whether or not the predictions of the theory hold when the different assumptions are relaxed.

### 2.2 *The Theory*

In the simple Ricardion model, different marginal rates of transformation were a consequence of different labour productivities. But this model does not explain, where the different productivities come from. It just takes the different production possibility frontiers as given.

The attempt of Heckscher and Ohlin was to explain the reason for this different curves. So they had to explain the different productivities. They focus on the advantage based on different *factor endowments* of the countries.

The basic idea of the theory is, that:

*„Generally abundant factors are relatively cheap, scanty factors are relatively dear, in each region.“ - B. Ohlin<sup>6</sup>*

So the different factors like: labour, capital, land, natural resources, skills and so on have different prices in the countries. If for instance one country is highly endowed with factor A and another country relies much more on factor B, the first country will be able to produce goods cheaper, which effort much of good A (because this is cheaper in this country) and the second country will be able to produce good B cheaper (because here this nation has a higher endowment with the recommended good). So, in this example the first country has a comparative advantage in good A and the second one in good B.

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<sup>5</sup> That a relaxation of these assumption **has** an effect on the theory of trade is shown by the new approaches to explain trade, especially intra-industry trade and economics of scale.

<sup>6</sup> see: Ethier, Wilfried J. Modern International Economics, Norton & Company, 1995, p. 123

One important result of this theory would be: The bigger the differences in factor endowment between two countries, the bigger the trade between these countries. As we will see below, this prediction is very problematical, even if there are a number of subsequences which I will mention now shortly.

It is interesting to notice that the sporadic attempts made by earlier writers to explain pattern of comparative advantages centred on the relative abundance of *natural resources*. Capital and labour endowments never seem to have been introduced<sup>7</sup>.

### **2.3 Subsequent extensions.**

One important subsequent extension was made by Paul Samuelson in 1948. This is the so-called ‘factor price equalisation’ theorem<sup>8</sup>.

This theorem states, that if all assumptions of the Heckscher-Ohlin theory hold, then the opening up of trade between any two countries with different factor prices and therefore different comparative costs will lead to a tendency towards the equalisation of factor prices in the two countries because the demand for the abundant (cheap) factor will increase and so the price for this factor will increase too. Heckscher formulated his theory in terms of complete equalisation<sup>9</sup>. Ohlin spoke instead of a ‘tendency towards’ a factor price equalisation, a fully equalisation is very unlikely, it can be regarded as a *border value*. So the Heckscher-Ohlin theory presents two theorems.

- a) International differences in relative factor endowments give rise to differences in the structure of relative commodity prices, thus making international trade possible.
- b) Not only commodity prices, but also factor prices are equalised or then to be equalised through trade.

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<sup>7</sup> Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 16

<sup>8</sup> The factor cost equalisation theorem was first formulated by Heckscher in 1919. It was later taken up and made internationally known by Ohlin. It was later criticised by Samuelson, who, in three papers returned to Heckscher’s ideas. (see Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 124).

<sup>9</sup> see: Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 124

A further extension was made by Stolper and Samuelson<sup>10</sup> in 1941. They have connected the factor price with the product price and mentioned that the possibility exists, that the owners of a country's scarce factor of production may be worse off as a result of trade.

Another, very important factor is regarding the demand-side: the Linder-Theory. The basic thoughts of this theory will be described in the next chapter.

### **2.4 Test of the Theory - Critique**

The theory can be subjected to empirical testing to see how well it explains actual trade patterns. One of the first attempts made in this direction was by Wasily Leontieff. His findings appeared to refute the Heckscher-Ohlin theory. Some more tests have appeared to refute the theory, others have appeared to lend some support to it<sup>11</sup>.

One of the most important hints which seems to refute the theory is the circumstance, that this theory is not able to describe one pattern of trade, which is getting more and more important: Intra-Industry trade. This kind of trade describes the trade between similar countries with similar goods. The Heckscher-Ohlin theory on the other hand stated, that the trade between different countries would be the most important kind of trade.

This contradiction was one of the reasons for further research, like done by the Swedish economist Linder. His theory will be described now.

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<sup>10</sup> see also: Grossmann Gene M., Handbook of international Economics, Elsevier, 1995

<sup>11</sup> even if it "has not a full scale testing" (Richard Cavens in Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 85)

### 3 The Linder-Theory

As already mentioned one of the most important facts that make the factor proportions theorem unsatisfactory is the circumstance is that it does not make it possible to explain intra-regional trade, as factor proportions by Ohlin's definition do not differ within a region<sup>12</sup>.

Linder further claimed that "a country cannot achieve comparative advantage in the production of a good which is not demanded on the home market. If this is a necessary (but not a sufficient) condition for securing a comparative advantage, it follows that trade will be most intensive among countries with similar demand structures."<sup>13</sup>

He hypothesised and found that a country like Sweden tends to specialise in the production and export of such quality products as are demanded by the country's income class with the largest numbers. Product qualities demanded by income groups with smaller numbers typically are imported from countries, where the appropriate income is enjoyed by the largest proportion of the population<sup>14</sup>. More general: Consumers in countries with high per capita incomes had demand patterns skewed towards high-quality goods. Consumer in countries with low per capita income had demand patterns skewed in favour of low-quality goods<sup>15</sup>. This essence is shown in figure 1.

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<sup>12</sup> Linder mentions some more disadvantages like the possibility that 'differences in factor proportions do not have any effect on relative commodity prices'; Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 85 . But these 'possibilities' shall not be regarded further in this essay.

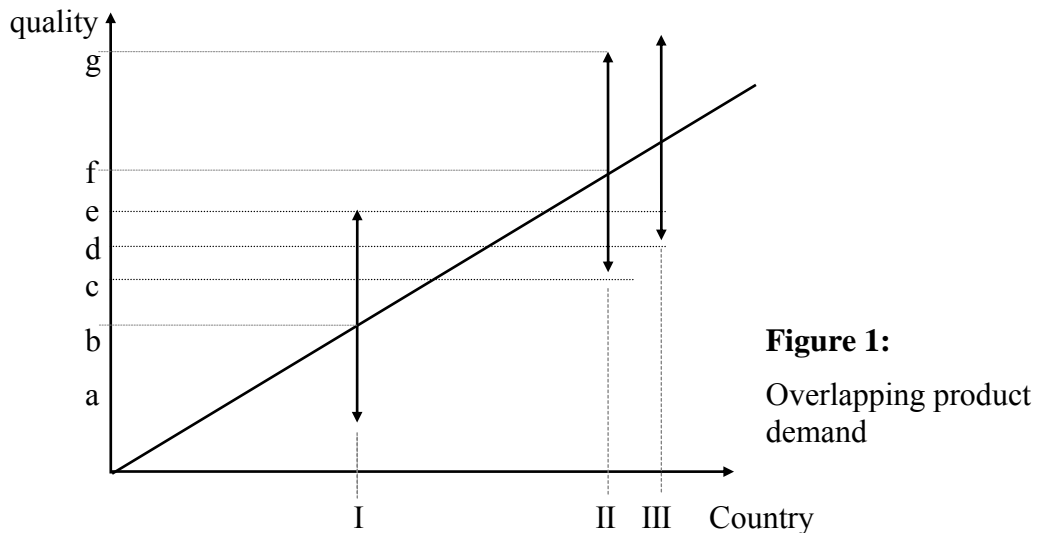
<sup>13</sup> Linder Staffan B. An Essay on Trade and Transformation, New York 1961, p. 17

<sup>14</sup> Grubel and Lloyd, Intra-Industry Trade, 1969, p. 10

<sup>15</sup> Grimwalde Nigel, International Trade - New Patterns of Trade..., 1989, p.16



Country I has a low per capita income and so it is demanding low price products (the qualitative range a-e is common to these countries with b as the average; Country II has a high per capita income and so it is demanding high price products (the qualitative range c-g is common to these countries with f as the average; trade may take place between these two countries, but only within the range of the 'overlapping product demand' (c-e), because Country II has no demand for a product of lower quality than c and Country I has no demand for products of a higher quality than e.



To the extent that per capita income determines the demand structure, trade between countries will be more intensive the more equal the capita incomes are. In the example/ diagram: Country III will trade much more with country II than with Country I.

**Result:**

The more capital and labour proportions -hence per capita incomes and, consequently, demand structures- differ, the more widely will commodity price structures differ and the greater will be the scope for trade.

## 4 Comparing the Theories.

As described above, the Heckscher-Ohlin theory comes to the result, that the countries with the biggest differences in factor endowments have the biggest differences in prices for the produced goods and therefore the biggest comparative advantage. So these countries (with the biggest differences) will do the most trade with one another. But this (the result of the factor proportions model), is exactly the opposite to Linder's hypothesis.

**So the result of the Linder-Theory is<sup>16</sup> the opposite of the Heckscher-Ohlin theory.**

Linder himself gives some very logical answers on the questions whether his theory or the version of Heckscher and Ohlin is 'right'.

He argues, that one basic assumption of the Heckscher Ohlin model is the fact, that the countries are well abundant with different factors. But these factors are natural resources (they must be natural resources because every other kind of factors could be transported/ traded so that differences would disappear soon).

Linder agreed that factor endowments played a dominant role in determining patterns of trade, but he restricted this view on primary commodities. Regarding the primary commodities, the Heckscher-Ohlin-model describes the pattern of trade in the 'correct way'. but trade in manufactured goods is more likely between countries with similar factor endowments; and this leads to the prediction, that countries with similar per capita incomes will do the most trade with one another (especially in manufactured goods).

So the different result follows by relaxing the assumptions, that "the consumer preferences are assumed to be identical in all countries" and " products are homogenous, so that is there is no product differentiation" (see assumption 8 and 9 on page 2). Linder on the other hand made the opposite assumptions and has proofed them empirically.

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<sup>16</sup> or better: ...seems to be the opposite...

There are numbers of (further) hints which make the Linder-Theory appear to be '(more) realistic'.

First most of the empirical testing (Leontieff etc.) like mentioned above appear to refute the theory of Heckscher-Ohlin-Model. The theory of Linder appears to be proofed by the history. So is the phenomena of 'Intra-Industry-Trade' getting more and more important. Meanwhile there is more than 80% of the world trade belonging to this kind of trade. It is an important weakness of the Heckscher-Ohlin-Theory that it cannot explain this kind of trade - because it assumes identical products.

Second it is obvious, that there are important differences between consumer demands and also between the products. 'Differentiation' has been one of the most common words in the area of marketing during the last decade.

Last but not least it is as obvious, that the assumptions for the HOS-Theory are not very realistic. It is immediately apparent that many of these assumptions fail to hold in the real world.

But, never the less the Heckscher-Ohlin-Theory is a good basis for explaining the basic reasons for trade. One of its most important advantages is, that it is very easy to use and to understand and that it is able to describe the directions of trade.

All in all, they are just theories, and the real world is much more complex as that it would be able to describe all possible patterns of trade with one model and this for ever and ever.

## 5 Summary

As shown in this work, the Heckscher-Ohlin-Theory is a good basis for describing the basic reasons of trade. But this theory is based on a number of assumptions, which fail to hold in the real world. So it was only a question of time, when the real patterns of trade could not be described by this theory any more.

The Linder-Theory is one step to fill this gap. He argues that there must be a local demand for a product before a nation will export that product and that the trade will be the greatest between nations with similar<sup>17</sup> demands. This theory is able to describe one of the most important pattern of trade, we face today: The ‘Intra-Industry-Trade’.

Even if the Linder theory comes to (exact) the opposite result as the Heckscher-Ohlin-Theory does<sup>18</sup>, it does not describe the direction of trade or expose the specific attributes of local demand that allow one nation to gain advantage in a particular industry<sup>19</sup>.

Linder himself gives several reasons for his outcome. One of the most important ones is that he restricted his view on the manufacturing sector in which the role of demand is quite different from the one in the primary sector.

So the Linder-Theory can be regarded as an extension to the Heckscher Ohlin model, necessary to describe the patterns of trade especially in the manufacturing sector and the (basic) Heckscher Ohlin model is still feasible in the primary sector.

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<sup>17</sup> or like Linder says: ‘with overlapping’ demands

<sup>18</sup> especially for the manufacturing sector

<sup>19</sup> Porter Michael, The competitive advantage of nations, 1991, p.785

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