

## Comparative Costs Revisited

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**Abstract:** The theory of comparative advantage is the oldest – and most fundamental – principle in international economics. Its empirical significance, however, changes with the times. Given the intensification of the forces of globalisation, the importance of comparative costs should now be revisited in order to consider dynamic changes in the global economy, the connection between a country's comparative advantage and a firm's competitive advantage, and the effects on more developed countries of trade with less developed countries.

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### Introduction

The theory of comparative costs is the oldest – and most fundamental – principle in international economics. Indeed, the law of comparative advantage may be regarded 'as one of the greatest achievements of economic theory' (Machlup, 1977:42). Its analysis has general relevance as an efficiency rule – whether applied to a nation, region, or multi-product. Its logic is institution-free and applicable to any decision mechanism that must exercise the logic of choice in resource allocation. From the time of Ricardo's exposition to now, the theory has been validated in words, diagrams, mathematics, and by the computer.

The empirical significance of the theory, however, changes with the times. Given the intensification of the forces of globalisation, the theory of comparative advantage should now be revisited in order to consider dynamic changes in the global economy, the connection between a nation's comparative advantage and a firm's competitive

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advantage, and the effects on the more developed countries of trade with the less developed countries (LDCs). This article considers these empirical issues.<sup>1</sup>

## **Dynamic Comparative Advantage**

The Ricardian and Heckscher-Ohlin (H-O) analyses of comparative costs are based on 'natural advantage' and are for trade at a given moment of time. But a country's comparative advantage can be 'acquired'. And it is not static, given once for all. Instead, it is dynamic – changing over time as a new comparative advantage is acquired.

In the beginning, Adam Smith actually referred to both 'natural advantage' and 'acquired advantage'. He said,

‘Whether the advantage which one country has over another, be natural or acquired, is in this respect of no consequence. As long as the one country has these advantages, and the other wants them, it will always be more advantageous for the latter, rather to buy of the former than to make. It is an acquired advantage only, which one artificer has over his neighbour, who exercises another trade; and yet they both find it more advantageous to buy of one another, than to make what does not belong to their particular trades’.  
(Smith, 1776: Book IV, ch. II)

The natural advantage of Ricardian-type goods is based on historical differences in labour productivity, and the natural advantage of Heckscher-Ohlin -type goods is based on relative factor endowments. More significantly, however, comparative advantage can be acquired over time through the evolution of the product life cycle, changes in factor endowments, the differentiation of products, and the acquisition of increasing returns to scale.

Nations have a comparative advantage in industries in which their firms gain a lead in technology, thereby allowing the creation of new products or product improvement. Innovations based on new technology initially give a country a temporary monopoly position and easy access to foreign markets. The first-entrant country may enjoy an export monopoly as long as there is an imitation lag in other countries. But eventually the technological gap is narrowed, the imitation lag is overcome, and other countries may then acquire a comparative advantage in the product.

This type of product life cycle is significant in the passing of old products from the more developed countries to new production in the less developed economies. The determinants of comparative costs may change so much over time that a country that

initially imported a product begins to substitute home-competing production for the import, becomes more efficient in its import-substitution production, and eventually acquires a comparative advantage for the mature product based on its lower costs of production. This is the other side of the product cycle – what Japanese economists call the ‘catching-up product cycle’ (Kojima, 1977:150-52).

Overseas producers may then actually begin to export the old product to third countries and to the first country, which has lost its initial comparative advantage. A global product life cycle can thus occur over several country markets. For example, the production and export of TV sets from the US gave way to imports from Japan and then from South Korea and Taiwan. Finally, in 1995, a Korean firm acquired control of Zenith, the last American manufacturer.

As the technological gap narrows and the imitation lag shortens, so too does the product gap. As the comparative advantage in the mix of input requirements changes over the product’s life cycle, so does the comparative advantage of producing the product in one country rather than another. Through technological change, there is a continually changing international division of labour. Changes in comparative costs can be expected to be even more rapid in the future as technological progress accelerates, imitation lags shorten, and product life cycles speed up.

More generally, comparative advantage changes as a country’s factor endowment evolves over time. A country that is initially labour abundant may become relatively labour scarce over time; a country that is capital scarce may become more plentifully endowed with capital. South Korea and Taiwan, for example, have now reached a situation in which labour is relatively scarce, and inexpensive labour has disappeared. At the same time, capital accumulation has been rapid, and more of their exports reflect capital intensity.

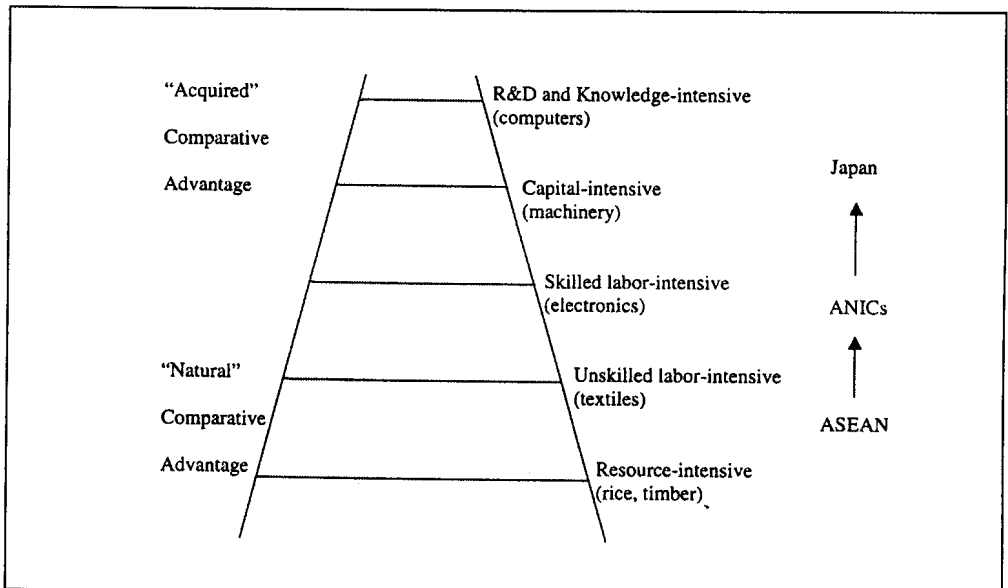
In the more developed countries, the evolution of factor endowments increasingly favours capital-intensive and research-intensive products. Over time, labour skills are upgraded, R&D efforts become more extensive, technological progress occurs. In essence, factors are created and comparative advantage is acquired. As Porter (1990:78) emphasises, ‘Nations succeed in industries where they are particularly good at factor creation’. In an industrial export industry of an advanced country, the characteristics of high skill-intensity, high research intensity, technical change, innovations, and economies of scale are all likely to be strongly interrelated.

Over time, an industrialising country tends to proceed up a ladder of comparative advantage – from initially exporting commodities that are natural resource-intensive (sugar or rice) to commodities that are unskilled labour-intensive (textiles) to semiskilled and skilled labour-intensive (electronics) to capital-intensive (machinery) and finally to the export of knowledge-intensive commodities (computers, control equipment). As depicted in Figure 1, the upward movement is from exports that embody basic factors such as natural resources and unskilled or

semiskilled labour to exports that embody more advanced and specialised factors such as highly educated and skilled personnel and R&D activities. The basic factors are passively inherited, representing natural or historical comparative advantage based on differences in labour productivity (Ricardo-type goods) or in factor endowments (H-O-type goods). They give a cost-based advantage in the production of some products. But the basic factors dominate only the lower rungs of the ladder. As a country develops, the advanced factors that dominate the top rungs are upgraded over time through considerable investment in human and physical capital to allow the country to acquire comparative advantage in differentiated products and proprietary production technology (Porter- and Krugman-type goods) (Porter, 1990:77; Krugman, 1986:8-14). This gives a product-based advantage derived from differentiated products or increasing returns to scale.

At the same time as the early-comers climb the ladder of comparative advantage, latecomers in the queue can occupy the vacant rungs. For example, as Japan proceeded up the ladder, South Korea came behind it – first exporting primary products in the late 1950s, subsequently moving upscale to textiles and plywood in the 1960s, and then iron and steel products and electrical machinery in the 1970s. By 1995, Korea's top three semiconductor makers were expanding to take away most of the global memory chip market from Japan.

Figure 1. Ladder of Comparative Advantage



The sources of comparative advantage evolve over time, thereby changing a country's composition of trade and its position on the ladder of comparative advantage. At the lower rungs, 'natural' comparative advantage is related to Ricardian and H-O-type of goods that have a cost-based type of advantage. The higher rungs of 'acquired' comparative advantage relate to Porter- and Krugman-type of goods that have a product-based type of advantage.

While Japan proceeds up the ladder of comparative advantage, it is now being followed by the Asian NICs (Taiwan, South Korea, Hong Kong and Singapore). Accordingly, Japan now imports more of the labour-intensive, low price manufactures (footwear, watches, radios, and TVs) from the latecomers to development. As the upper tier country moves on to specialisation in the more sophisticated products, the lower tier countries also expand their exports of the lower technology products to the markets of third countries. Japan's labour cost advantage in textiles and consumer electronics has long since been lost to South Korea and Hong Kong. The Asian NICs export textiles and the simpler consumer electronics products to North America and Europe as Japan specialises on even higher technology exports. Indeed, competition between Japan and the Asian NICs has been occurring more often in third country markets than in their own.

As the Asian NICs, in turn, move up the ladder of comparative advantage, their former positions on the lower rungs of the ladder are being taken by those behind them in the queue: Thailand, Malaysia, Indonesia, the Philippines. Thailand and Malaysia, in particular, have in recent years gained impressive footholds in export markets for manufactures. The dynamics of 'the ladder and the queue' have certainly been pronounced within the Asia Pacific region.

The changing pattern of Asia Pacific trade has also carried over the changes in trade patterns between the OECD countries (North America, Japan, European Union) and Asia Pacific. The more industrialised OECD countries engage in complementary trade with Asia in manufactures, exchanging capital goods for final consumer goods. Capital-intensive and technology-intensive goods are exchanged for labour-intensive and lower-technology consumer goods. To a lesser extent, the same is true for the OECD area and Latin America. Europe's trade with Africa, however, has remained of the more traditional type of manufactures for primary commodities, because sub-Saharan African countries have not yet become exporters of manufactures. While the major source in the developing world of US consumer goods imports is Asia Pacific, the major destination of American exports is Latin America. Japan's trade is the most complementary and integrated with the Asian countries.

## Dynamic Gains from Trade

The 'gains from trade' in the Ricardian or H-O models are on the side of importables. Instead of directly producing the importables, in which the country has a comparative disadvantage, it is more efficient to indirectly produce the importables by directly producing the exportables, in which the country has a comparative advantage. Foreign trade is thus like an industry that uses exports as inputs to produce imports as output. The principle of comparative advantage becomes an efficiency rule for maximising output (i.e., importables) per unit of input (i.e., exportables).

Beyond the gains on the import side, there are also dynamic gains from exports. Whereas the static gains from trade as a result of reallocating resources in accordance with comparative advantage explain a once-over change to a higher level of real income, the dynamic gains from exports explain the higher rate of growth in income over time.

Although dynamic elements were not central in classical and neo-classical thought, they were not ignored. John Stuart Mill, for one, was particularly clear on the dynamic gains. Trade, according to comparative advantage, results in a 'more efficient employment of the productive forces of the world,' and this Mill considered to be the 'direct economical advantage of foreign trade'. But, emphasised Mill, 'there are, besides, indirect effects, which must be counted as benefits of a high order'. One of the most significant 'indirect' dynamic benefits is

' the tendency of every extension of the market to improve the processes of production. A country which produces for a larger market than its own can introduce a more extended division of labour, can make greater use of machinery, and is more likely to make inventions and improvement in the processes of production' (Mill, 1848: vol. II, Book III, ch. XVII).

More generally, Myint (1958:318-19) has emphasised the dynamic 'productivity' theory of international trade that was part of classical thought. The 'productivity' theory links growth of the domestic economy to a country's foreign trade by interpreting trade as a dynamic force: trade widens the extent of the market and the scope of the division of labour, permits a greater use of machinery, stimulates innovations, overcomes technical indivisibilities, raises the productivity of labour, and generally enables the trading country to enjoy increasing returns and further growth.

In numerous econometric studies, the rate of growth of exports is the highly significant variable that explains the rate of growth of real GNP (Krueger, 1980: 288-92). The dynamic gains from exports explain in part why export promotion has had such a strong favourable impact in developing countries.

There has been increased capacity utilisation of plants, realisation of economies of scale, the creation of employment through export of labour intensive products, and an increase in total factor productivity. There is evidence that the faster export output grows, the faster is the growth in productivity. This is because of economies of scale, higher investment embodying capital of a more productive later vintage, and a faster pace of innovation in processes and products (Amsden, 1985).

## **Comparative Advantage and Competitive Advantage**

Having examined the sources of and changes in a country's comparative advantage, we may now ask how is this related to the competitive advantage of a firm? Under free trade, a country would import those commodities in which it has a comparative disadvantage. A domestic firm that then competes with these imports is unlikely to have a competitive advantage: costs will be too high or there will be greater demand for the imports because of non-price attributes such as style, quality, or service. Lacking a competitive edge against imports, the domestic firm may seek protection through government restrictions on the imports.

The competitive advantage of a firm with a global strategy, however, depends on where the firm locates its various activities. If the global competitor locates its different activities in different countries according to each country's comparative advantage, it will then at the same time achieve competitive advantage.

Although the classic reason for locating an activity in a particular nation is factor costs, competitive advantages also arise from dispersing activities to several or many nations to perform R&D, gain access to specialised local skills, or develop relationships with private customers. As Porter (1986, ch.1) observes, 'One of the potent advantages of the global firm is that it can spread activities to reflect different preferred locations, something a domestic or country-centred competitor does not do. Thus, components can be made in Taiwan, software written in India, and basic R&D performed in Silicon Valley, for example'. Intra-firm trade (i.e., imports from a firm's own subsidiaries abroad) characterises many multinational firms. Beyond horizontal international specialisation between different final products, multinationals are important in promoting vertical international specialisation between different intermediate stages of production. By decomposing the production process into different activities that are located in various countries according to factor endowments, and by undertaking world-wide sourcing for inputs and commodities, the multinational is seeking corporate advantage in conformity with the comparative advantages of the countries in which it operates.

The multinational thus acts as a unit of integration in the world economy. By investing overseas and transmitting technology, together with its realisation of

economies of scale in R&D and marketing, the multinational is a unit of real international integration.

By its multinational operations and intrafirm transactions, the multinational corporation (MNC) transcends the national barriers to commodity trade and impediments to international factor movements. As such, the MNC can become the mechanism for making effective a developing country's potential comparative advantage. The MNC provides the complementary resources of capital, technology, management, and market outlets that may be necessary to bestow an 'effective' comparative advantage to the labour-surplus factor endowment in the host country.

This can be appraised as efficient international production. The MNC views production as a set of activities or processes, and the global strategy of the MNC is tantamount to the solution of activity models of production, with production processes in many countries. A competitive equilibrium solution to the programming problem is imposed within the MNC when it operates efficiently as a planning unit.

This interpretation of the MNC as an efficient technical and allocational unit or integration means that whereas intrafirm trade conforms to corporate advantage, it is also identical with the realisation of comparative advantage. If the nation-state fragments the world economy through restrictions on commodity and factor movements and thwarts international economic integration, the MNC may serve a complementary – rather than competitive – function to the nation-state: the MNC may be the vehicle for evoking, in practice, the principle of comparative advantage in world trade, for trade in both outputs and inputs. The internal resource allocation in the MNC is a substitute mechanism of the market; when it realises comparative advantage in processes and activities, the resource allocation decisions of the MNC will be more efficient than those in unintegrated markets that are characterised by imperfections and uncertainty. For global technical efficiency, the world economy is the territorial unit of international production, not the nation-state, which is a unit of international politics.

Dynamic comparative advantage is what matters in allowing enterprises to proceed up the nation's comparative advantage ladder. The stock of factors at any particular time is less important than the rate at which they are created, upgraded, and made more specialised to particular industries (Porter, 1990:74). Over time, to maintain its competitive advantage or to achieve higher-order competitive advantages, a firm must invest and innovate. As Porter (1990:173) maintains, 'Sustaining advantage requires still further improvement and innovation to broaden and upgrade the sources of competitive advantage through advancing the product, the production process, marketing methods, and service.'

Comparative advantage refers to the nation. Competitive advantage refers to the firm.<sup>2</sup> But to retain the competitive advantage of a firm, management must continually anticipate changes in the comparative advantage of nations and be



prepared to respond to these changes. Over time, a country's comparative advantage in the production of different products may widen or narrow, according to changes in factor supplies, factor quality and factor prices, the opening and closing of technological gaps, the dynamics of innovations, and variations in learning curves. A firm's competitive advantage in those products will thereby also change, and strategic responses then become necessary to achieve total efficiency.

### **Effects of the LDCs on the More Developed Countries**

A new argument for protection has been propounded as a result of the growing importation of unskilled labour-intensive goods from the LDCs into the US, where since the late 1970s the real wages of less-skilled labour have declined relative to skilled labour. Some argue that, in accordance with the Heckscher-Ohlin factor endowment theory of comparative advantage, trade with the less developed countries should make skilled labour scarcer in the more developed countries, raising their wage, while it makes unskilled labour effectively more abundant, reducing its wage. It is also claimed that because of the movement of capital and the transmission of technology to the less developed countries, their productivity has increased. It is then contended that higher productivity combined with low wages have led to imports from the developing countries that push down the relative real wages of low skilled labour in the industrialised countries. Moreover, because of wage inflexibility in European labour markets, it is alleged that the importation leads to the pressures being felt in high unemployment in Europe.

Empirical studies do confirm the trends in earnings inequality during the 1980s and 1990s. For instance, in the US, the percentage by which the average annual earnings of those with a college education exceeded the average earnings of those with only a high school education rose steadily from 27 per cent in 1979 to 65 per cent in 1993. The drop in the relative position of the less skilled also appears in other ways: greater earnings differentials between older and younger workers; greater differentials between high-skilled and low-skilled occupations; in a wider earnings distribution overall and within demographic and skill groups; and in less time worked by low-skill and low-paid workers. The essential question, however, is whether trade is responsible.

Although growth in imports of unskilled labour intensive goods has been rapid, the amount is still too small to have a significant effect on wages. Since the industrialised nations spend only a little more than one percent of their combined GDPs on imports of manufactures from the developing countries, the new flows of labour embodied in that trade are small compared with the overall size of the labour force.

Although the relative wage decline for the unskilled is economy-wide, only a small proportion of workers – some 17 per cent in the US – are employed in manufacturing. Most of the unskilled are in service sectors where their wages can scarcely be determined by traded goods.

Furthermore, if trade lowered the relative wages of unskilled workers, we would expect to see a decline in the relative price of unskilled-labour intensive goods. Companies should then also substitute unskilled workers for more expensive skilled workers. But the evidence does not show these effects.

The evidence in the US suggests that the rise in demand for skilled workers was overwhelmingly caused by changes in demand within each industrial sector, not by a shift of the industrial mix in response to trade. The declining demand for less-skilled US workers has been across a whole range of industries, not simply those that produce tradable goods. Indeed the evidence is that between 1969 and 1993 industries unaffected by trade cut their use of low-skill workers even faster than trade-affected industries (Burtless, 1996:30). The reduction in the relative demand for less-skilled workers throughout the economy is primarily the result of technology and biased technological change. The substitution of capital and skilled labour for unskilled labour has been much more important than the effect of trade. Technological progress has made it profitable to use relatively more of better educated labour despite the fact that the less educated labour has become relatively cheaper. Besides biased changes in technology, the unskilled and less-skilled have also been adversely affected by forms of business organisation, economic deregulation, new patterns of immigration, and the diminishing influence of trade unions. It is also apparent that the wage gap between high- and low-skill workers has been accompanied by the growing segregation of workers by skill. It has become less common for high- and low-skill workers to work in the same firm. An increase in the mean skill level in a firm raises wages of highly skilled workers but causes those of poorly skilled workers to decline.<sup>3</sup>

Many analysts interpret the growth in earned income inequality as equivalent to a rise in skill premiums and an increase in economic returns to skills. Bigger wage differentials are especially evident for extra education, occupational skill and work experience.

From these empirical studies, we can conclude that trade is not a major cause of the inequality in relative wages in the US. For OECD countries, a study also found no major impact of trade on OECD employment or wage differentials either in total or by type of labour.<sup>4</sup>

In general, technical change within a country causes much more dislocation than do imports. In Joseph Schumpeter's words, innovations and technical progress lead to 'creative destruction'. The new industry outcompetes the old. Similarly, senile or lower-productivity industries in the more developed countries lose their markets to imports. Just as technical change in the domestic economy should not be inhibited,

neither should the workings of dynamic comparative advantage in the world economy. In neither case should the benefits of economic change be sacrificed for the sake of avoiding the cost of dislocation.

Further, the cost of dislocation in job displacement as a result of imports is often exaggerated. Not only is the number of those directly displaced lower, but in a general equilibrium analysis that allows for indirect consequences there may actually be an increase in employment. This may happen when the importation of lower priced intermediate inputs allows an expansion of the final output with greater employment in the final stages of production. An increase in consumers' real income as a result of lower priced imports may also increase demand for other products and expand employment in the other industries.

To the extent that imports may cause a problem of dislocation for labour, the superior policy reaction should be education and skill training and job relocation assistance rather than the  $n^{\text{th}}$  best policy of protection. Although particular groups within a nation may be adversely affected by imports, the total real national income still rises, thereby allowing some form of compensation, and the long-term gain outweighs any short-term loss.

## NOTES

<sup>1</sup> Some of the discussion is adapted from the author's (1998), *The International Environment of Business: Competition and Governance in the Global Economy* (New York: Oxford University Press).

<sup>2</sup> For a clarification of the distinction between comparative advantage that applies to a country and competitive advantage that applies to a firm, see Peter G. Warr (1994), 'Comparative and Competitive Advantage', *Asian-Pacific Economic Literature* (November): 1-14; Peter G. Warr (1992), 'Comparative Advantages and Competitive Advantage in Manufactured Exports', *EDI Working Paper*, World Bank; John H. Dunning (1992), 'The Competitive Advantage of Countries and the Activities of Transnational Corporations', Review Article, in U.N., *Transnational Corporations*, (February): 135-68.

<sup>3</sup> Michael Kremer and Eric Maskin (1996), 'Wage Inequality and Segregation by Skill', *NBER Working Paper 5718*, August.

<sup>4</sup> The OECD Jobs Study (1994), *Evidence and Explorations* (Paris: OECD Publications).

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