

COMPARATIVE ADVANTAGE, ECONOMIC GROWTH AND FREE TRADE*

*Julio López Gallardo***

ABSTRACT The paper has two objectives. The first is to discuss whether developing countries can benefit by specializing according to their comparative advantage. The second objective is to discuss if an economy that adopts a free market policy, will in effect achieve greater economic efficiency. The author concludes that specialization according to comparative advantage would indeed benefit a country. He also argues that in an economy ruled by free competition and without governmental interference, market signals and forces are not by themselves sufficient to provide the necessary incentives to producers so that they fully use the available resources, and produce and trade according to comparative advantage.

Key words: comparative advantage, trade and growth

JEL Code: F10, F43, 00

VANTAGEM COMPARATIVA, CRESCIMENTO ECONÔMICO E LIVRE COMÉRCIO

RESUMO Este artigo tem dois objetivos. O primeiro é discutir se os países em desenvolvimento podem ser beneficiados por uma especialização baseada em sua vantagem comparativa. O segundo objetivo é determinar se uma economia que adota uma política de mercado livre alcança de fato uma maior eficiência econômica. O autor conclui que a especialização baseada na vantagem comparativa pode realmente beneficiar o país. O autor também acredita que, numa economia onde predominam a livre competição e a ausência de interferência governamental, os indicadores e as forças de mercado não são suficientes para oferecer aos produtores os incentivos necessários para que eles utilizem os recursos disponíveis e produzam e comercializem de acordo com a vantagem comparativa.

Palavras-chave: vantagem comparativa; comércio e crescimento

Código JEL: F10, F43, 00

* Paper received on August 27th, 2004 and approved on February 18th, 2005. The author would like to express his deep gratitude to an anonymous referee of the *Revista de Economia Contemporânea*, whose insightful comments stimulated him to carry out a complete revision of a previous version of the paper.

** Professor at the Faculty of Economics, Universidad Nacional Autónoma de México, e-mail: gallardo@servidor.unam.mx

INTRODUCTION

One of the objectives of liberalizing and opening up the economy to free trade carried out in some developing countries has been to modify productive specialization and foreign trade relations in order to increase the relative share in production and trade of tradable goods — particularly those produced with labor-intensive technologies —, and thus improve the efficiency of the economy (World Bank, 1987).

This strategy supposes, implicitly at least, that, by lowering tariffs and eliminating non tariff barriers to trade, the economy will move along its production possibility frontier in such a way that production and exports of labor-intensive goods will rise and efficiency will improve. More particularly, it is thought that, after trade liberalization, the relative price and profitability of labor-intensive goods will go up, leading to the channeling of resources away from capital-intensive in favor of labor-intensive commodities. It is also supposed that full utilization of resources will be safeguarded (apart from temporary and minor disturbances).

This paper has two objectives. The first is to discuss whether developing countries can achieve significant gains in production and external trade by specializing according to their comparative advantage. Unlike other studies on the subject, we are not going to examine the subject from the perspective of the neoclassical theory, but rather from M. Kalecki's theoretical paradigm. It is true that Kalecki did not directly analyze this issue, but his works on socialist economies (1963) can be — and have actually been (Laski, 1966) — fruitfully utilized to shed light on the subject.

The second objective is to discuss to what extent an economy that adopts a free market policy with no government intervention, lowers tariffs and eliminates non tariff barriers to trade will in effect achieve greater economic efficiency, and more specifically, fully utilize its resources and specialize according to comparative advantage.

THE PRINCIPLE OF COMPARATIVE ADVANTAGE

In order to carry out the analysis, first it is necessary to differentiate between two concepts. The first one is the concept of comparative advantage, and

the second, the neoclassical theory of foreign trade. The idea behind each of the two concepts is different.

The concept of comparative advantage belongs to the field of normative economics, and states that a country will benefit if it specializes in the production of goods whose manufacture is intensive in its abundant resources. Thus, in developing countries where the reserve labor force is very large owing to open or disguised unemployment (Myrdal, 1956; Prebisch, 1959), best results can be achieved by specializing in the production of labor-intensive goods.

On the other hand, the neoclassical theory of international trade belongs to the domain of positive economics, and it maintains that in a free trade economy with no government interference, market forces will, on the one hand, safeguard that the economy will produce as much as is allowed by its productive possibility frontier, and, on the other, direct production and resources, as well as trade, in accordance with comparative advantage (Harberler, 1936).¹

We shall first discuss the principle of comparative advantage. In order to proceed, some of concepts have to be clearly defined, and the relationship between them clearly stated.

The first concepts requiring definition are capital intensity and labor intensity. In this paper, capital intensity will be understood as equivalent to the capital-output ratio, i.e., the amount of fixed capital utilized in the production of one unit of a given commodity; and the same goes for labor intensity. Let k_i represent the capital intensity and l_i represent the labor intensity required to produce commodity i . Then,

$$K_i = K_i / Y_i \quad (1)$$

$$l_i = L_i / Y_i \quad (2)$$

where the price of commodity i and the price of the capital good required in its production are set to units, and:

L_i = the number of workers employed in the production of commodity i .

K_i = Capital employed in the production of commodity i .

Y_i = the number of units of commodity i produced and their value.

By definition, labor productivity in the production of commodity i , denoted by a_i , is identically equal to the inverse of the labor intensity of production of commodity i .

$$a_i \equiv Y_i / L_i \quad (3)$$

If j commodities are produced, the average capital-output ratio, k , turns out to be:

$$k = (K_1 + K_2 + \dots + K_j) / (Y_1 + Y_2 + \dots + Y_j)$$

$$k = k_1 \lambda_1 + k_2 \lambda_2 + \dots + k_j \lambda_j \quad (4)$$

where λ_i is the relative share of commodity i in total output ($\lambda_i \equiv Y_i / Y$; $Y \equiv Y_1 + Y_2 + \dots + Y_j$)².

At the same time, average labor productivity in any given year is equal to:

$$a = a_1 \gamma_1 + a_2 \gamma_2 + \dots + a_j \gamma_j \quad (5)$$

where γ_i is relative share of labor in the production of commodity i in relation to total labor L ($L = L_1 + L_2 + \dots + L_j$).

Finally, we will introduce the concept of incremental productivity of labor. This refers to labor productivity in the factories that start operation during the current year, thanks to investments which "mature" this same year. Incremental labor productivity is denoted by a' , and its growth rate by α' . Average labor productivity in year t , denoted by a_t , refers to the average productivity in factories which started operation during the last n years, where n refers to the life span of the capital equipment (i.e., machinery which started operation $n + 1$ years earlier have been scrapped).

Supposing that the intensity of labor and capital in the production of each product remains constant, it is obvious that an increase in the share on production of labor-intensive commodities, which have at the same time low capital intensity, will lead to an increase in average labor intensity and a reduction in the capital-output ratio and average labor productivity.

This elementary idea forms the basis of the principle of comparative advantage. If a country exchanges goods on world markets in such a way that labor-intensive goods are exchanged for capital-intensive goods, then it could specialize in the production of labor-intensive goods and increase average labor intensity.

PRODUCTION SPECIALIZATION AND INTENSITY OF FACTOR USE

Let us now make clear the distinction between absolute and relative advantages. Suppose that an economy can exchange commodities that have equally low capital and labor intensity for commodities that have higher capital and labor intensity. In this case, it has an absolute advantage and it could specialize in the production of this type of commodities. Thanks to such specialization, it could reduce its average capital-output ratio and, at the same time, increase its average labor productivity. The advantage that comes about, thanks to trade based on this specialization, is obvious and needs not further discussion.

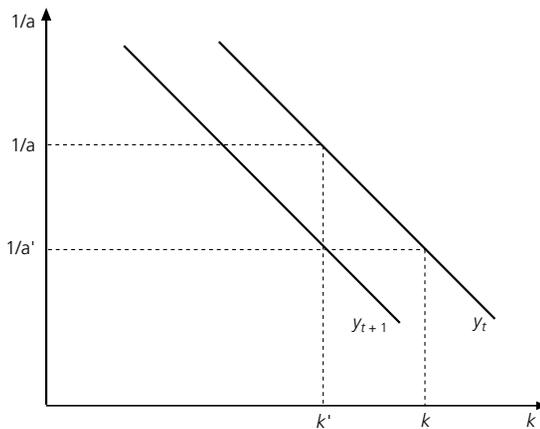
Comparative advantage is a different matter. Suppose a developing economy that, up to a certain year, has not produced and traded according to its comparative advantage: namely, some of the commodities exchanged are high in capital and low in labor intensity. In this case, a shift in the pattern of specialization — in favor of low capital and high labor intensity commodities — brings about a reduction in both incremental and average capital-output ratio, which now goes hand in hand with a reduction in the average productivity of labor.

The economy would then stop producing some high capital-intensive commodities, and the value of parameter λ for these commodities (see equation 4) equals zero, whilst the value of λ for the low capital-intensive commodities increases, which in turn results in the lowering of the average value of k . By the same token, the value of γ for commodities with high labor productivity, which are no longer produced, will be zero, thus raising the value of γ for some commodities with low labor productivity and leading to the lowering of the average value of a in equation (5).

Graph 1 shows the effect of greater specialization between different types of commodities, and specifically, those with comparative but not absolute advantages in relation to average capital-output and average labor productivity.

The horizontal axis of graph 1 shows the capital-output ratio, and the vertical axis shows the inverse of labor productivity. The curve y_i (assumed linear to simplify) shows different patterns of commodity specialization, from which a unit denomination of national income is obtained, under the assumption that the intensity of capital and labor of each particular com-

Graph 1



modity remains the same. For example, greater specialization in low capital-intensive, high labor-intensive commodities will lower the capital-output ratio, and necessarily lead to a fall in labor productivity a ; this accounts for the negative downward slope of curve y_t .

The curve y_{t+1} shows the effects of technological progress. In year $t + 1$, a unit of national output could be obtained with a constant capital-output ratio (k'), while labor productivity goes up in relation to the previous year, passing from $(1/a)$ to $(1/a')$. Alternatively, this same unit of national production could be generated with constant labor productivity (at a'), but with a lower capital-output ratio (from k to k').

As was pointed out above, when the pattern of specialization changes, average labor productivity and capital-output ratio will both change. For example, if the structure of production shifts in favor of low capital intensity goods, this will bring forth the lowering of average labor productivity. In this case the benefits of specialization and trade are not so evident as in the case, of absolute comparative advantage, and will depend on the relative availability of factors of production. We are now going to analyze these benefits through simple, but rigorous, reasoning. In order to focus on the problem, we supposed that effective demand and the degree of utilization of production capacity are not affected by changes in productive specialization,

and we also assumed that there are no impediments to transfer resources, nor costs associated with the transference of resources from one line of production to another. These are very important assumptions, and they will be more thoroughly discussed below.

THE BENEFITS OF COMPARATIVE ADVANTAGE

The growth rate of output can be expressed in two different ways, which are not independent of each other. Let R be the growth rate of output, i denote the investment coefficient, i.e., the share of investment in national output, and let d stand for the depreciation coefficient, i.e., the fall of production, as a share of national output, owing to the scrapping of equipment which is no longer used. Following Kalecki (1969), we posit:

$$R = \frac{i}{k} - d \quad (6)$$

The second method of expressing the growth rate of national output is in relation to the employment growth rate, denoted here by β , and the rate of growth of average labor productivity, denoted by α . Then:

$$R = \alpha + \beta \quad (7)$$

We consider now the case of a developing economy where unemployment is widespread, and where comparative advantage lies in the production of labor-intensive and low capital-intensive commodities. On the basis of a numerical simulation (not shown here to save space), we shall compare the evolution of some key variables under two alternative options. In option 1, productive specialization changes in favor of labor-intensive commodities, while in option 2, productive specialization remains constant. The underlying assumptions to construct the two scenarios are that the life span of machinery is eight years, and that technological progress is taking place and comes about with an annual growth of incremental labor productivity of 1% per year. Technological progress is supposed to be neutral, in the sense that the rate of technological progress is the same for all productive specializations and all capital-output ratios. Homogeneity is also supposed, in the sense that the rate of technological progress remains the same every year.

Assume that, during a period of at least n years ($n > 8$), the structure of production and the capital intensity of all domestically produced goods remain the same. The capital-output ratio will remain the same as long as no changes occur in the technology used in any branch. With homogenous technological progress, incremental and average labor productivity will grow at an equal and constant rate of 1% per annum.³

The numerical results of options 1 and 2 are now discussed. Equations (6) and (7) have been used in both cases, and the assumptions stated above taken into account. In both options, we suppose that the rate of growth accelerates from 2% to 4% in 2005. In the first option, we assume that this is accompanied by a change in productive specialization towards labor-intensive goods. This leads to a reduction in the capital-output ratio from 3 to 2, which in turn leads to a fall in the rate of growth of (incremental and average) labor productivity. In option 2, no such change in the pattern of specialization takes place.

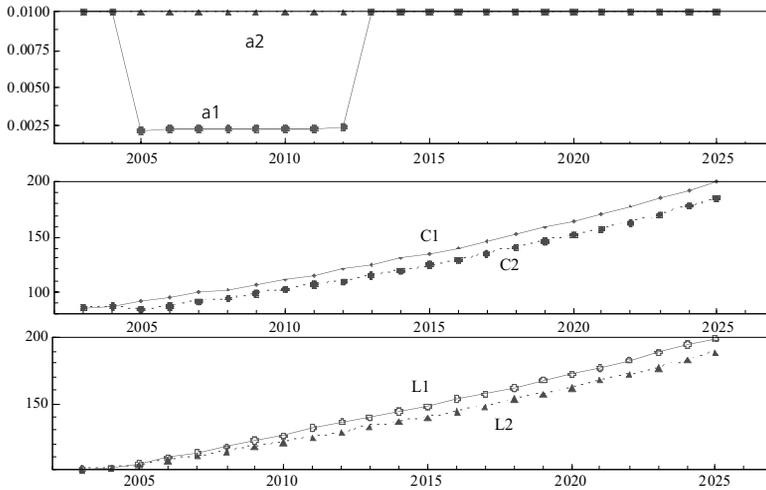
In option 1, the rate of growth of average labor productivity falls below 1%, say, to $\alpha - \delta_\tau$, in which δ_τ is the proportional fall in the growth rate of labor productivity which occurs as a result of the change in the pattern of specialization.⁴ The rate of growth of average labor productivity will be lower than the original α until the investment structure has changed completely. Once retooling is completed, incremental and average labor productivity will start to grow again at their original rate α , but the capital-output ratio will remain at its new, lower level.

What effects will the change in the pattern of specialization have on the main macroeconomic variables? Answers are shown in graph 2 for average labor productivity a , employment L , and consumption C . We assume that the rate of unemployment D (which we define as $D = (L^* - L)/L$, where L^* is labor supply) in 2004 is 23.8% and the annual rate of growth of the labor supply is 2%.

A comparison between the two options shows that, from the point of view of consumption and employment, the best situation is reached under option 1, i.e., when accelerated growth is accompanied with a change in productive specialization in favor of labor-intensive goods.

Indeed, growth rates and output levels are (by construction) identical for both options, but consumption and employment will always be higher

Graph 2



in the first option until the reserve labor force has been completely exhausted (in option 1, this would happen in 2026). In option 1, consumption grows above output between 2005 and 2026, while consumption grows below output in option 2. In the first option, consumption will have grown 9% more than in the second in the final year. At the same time, when the reserve labor force is completely absorbed in option 1, the unemployment rate is still positive in option 2 at 5.6%.

As can be seen, consumption gains are not achieved free of costs. The reduction in the capital-output ratio in option 1 is accompanied by a fall in the rate of growth of labor productivity which leads to the faster growth of employment in option 1 than in option 2. That is to say, consumption gains are paid for with higher employment. However, such a cost is easy to bear in an economy which has a large unoccupied reserve labor force.

Now, taking option 1, if productive specialization and the capital-output ratio remained constant, after year 2026 it would be impossible to sustain a 4% rate of growth of output, unless measures were taken in order to stimulate higher labor productivity. Indeed, the growth rate of output cannot exceed the sum total of the employment growth rate plus the rate of growth of labor productivity. The first cannot rise above 2%, which is the rate of growth of labor supply. The second remains at 1% because of the stability of

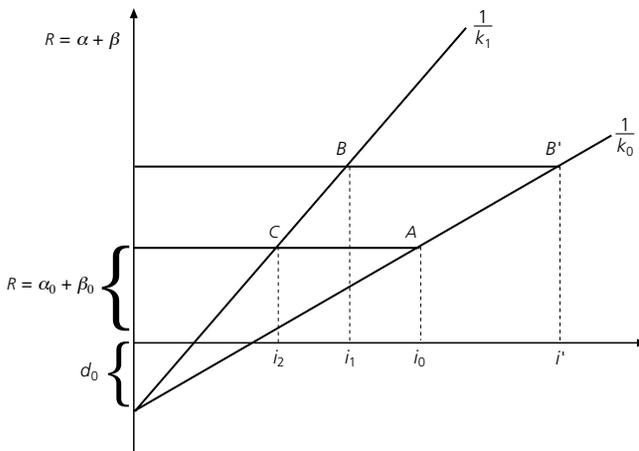
the productive specialization and the capital-output ratio. Therefore, in that year, the growth rate of output will have to go down. This in turn is accompanied with a decline in the investment coefficient i , thus leading to a subsequent rise in the consumption coefficient and in the level of consumption.

Graph 3 shows the process of accelerated growth and changes in productive specialization, capital-output ratios and labor productivity. The horizontal axis shows the investment coefficient i and the vertical axis shows the growth rate of output R .

In the year prior to the beginning of the process of change in the pattern of specialization, an investment coefficient i_0 and a capital-output ratio R_0 (given a depreciation coefficient d) are associated with a rate of growth of output R_0 (point A). Given a rate of growth of labor productivity α_0 , the employment growth rate would be β_0 .

The change in the pattern of specialization brings about a reduction in the capital-output ratio from k_0 to k_1 ($k_1 < k_0$), in such a way that the line which associates the investment coefficient with the growth rate of output shifts upwards. Growth can be accelerated from A to B with an investment coefficient i_1 , which is smaller than the initial investment coefficient. Note that, if the pattern of specialization and the capital-output ratio did not change, the resulting rate of growth ($B' = B$) would require an investment coefficient i' ($i' > i_0 > i_1$).

Graph 3



High growth rates could then be maintained as long as there is a reserve of labor. Once the reserve labor force is absorbed, the economy will have to grow at its previous rate. In the graph, this requires a movement from *B* towards *C*. However, a lower rate of product growth will enable a reduction in the investment coefficient from i_1 to i_2 . But, of course, if higher rates of growth are aimed at after the labor surplus has been exhausted, then, and only then, it would be justified to change productive specialization in favor of capital-intensive industries.

CRITICISMS TO THE PRINCIPLE OF COMPARATIVE ADVANTAGE

The principle of comparative advantage has been criticized for a number of reasons which, in general terms, tend to focus on the idea that a developing economy which specializes in labor-intensive goods will find itself limited or blocked from achieving full modernization.⁵ We are now going to give a brief review of some of the main critiques and then attempt to evaluate their validity in the case of a developing economy.

The first criticism relates to the loss of competitiveness and the resulting reduction in export dynamics in an economy that specializes in labor-intensive goods. This is allegedly due to the fact that income and price elasticity of demand for these products on world markets are small, which is itself the reason for the slow growth of exports.

The truth is that the hypothesis upon which this criticism is founded has not been empirically proven. However, even if it were valid, its implications should not be overstated. Indeed, even relatively large economies' share in total world exports are not significant. Take Mexico as an example: in the last decade, total manufacturing exports represented around 7% of total manufacturing imports from the US. So, even if the rate of growth of demand for labor-intensive commodities on world markets were slow, Mexico would still have a great potential to fill it. On the other hand, both Mexico and Southeast Asian countries' experience shows that the price elasticity of exports from the developing countries can be quite high, and improvements in price competitiveness could increase enormously their exports (Amsdem, 1989; Wade, 1990).

A second criticism argues that specialization in labor-intensive goods means that total wages would be high, which in turn leads to greater con-

sumption and, therefore, lower savings and investment coefficients. With this, the investment process, or capital accumulation, is limited, and economic growth can be hampered. However, the problem with this criticism is that it loses sight of the objective of the economic process, which is not accumulation or even production, but rather consumption (and employment). Growth of consumption and employment can be achieved, as indeed growth in output, with relatively low levels of investment, if the capital-output ratio is relatively low as well.

It is of course true that, if an economy has a rigid pattern of specialization, then, in the long term, when the labor force reserve has been exhausted, the level of output will be lower than if specialization had relied on capital-intensive commodities with higher labor productivity (assuming that the labor surplus has been indeed absorbed). However, once the reserve labor force has been used up, the pattern of specialization can be modified in favor of high labor productivity (and/or production methods which are highly capital-intensive and where labor productivity is also high). From the point of view of the time-pattern of consumption, this type of strategy will be better, insofar as consumption can grow at a faster rate.

It could be argued perhaps that the above example is not really valid because, when a specialization of production is adopted which initially favors labor-intensive, low labor productivity goods, it would be more difficult or even impossible to achieve high levels of productivity in the future, when the unoccupied labor force is used up. However, there are no cogent reasons why this pattern of specialization would lead to a permanent fall in labor productivity or its rate of growth. In fact, it can be argued that the opposite is more likely to happen. Indeed, the pattern of specialization favoring labor-intensive commodities brings forth higher levels of productive employment and of consumption during the first stages of the process. Some of this increased consumption may be directed to higher spending on education.⁶ Thanks to increased spending on education, and thanks also to the rise in productive employment, the training and qualifications of the workforce will be enhanced. As a consequence, it would be easier in the future (and not more difficult) to adopt modern technologies with high labor productivity, or produce goods which are highly capital-intensive and with high labor productivity.

Finally, a third criticism of the principle of comparative advantage sustains that a specialization in labor-intensive goods could have a negative effect on technological progress. In general terms, this is another criticism that does not seem to have many points in its favor. It has already been shown that an initial specialization in labor-intensive goods generates higher productive employment and can lead to higher spending on education. Both factors directly stimulate technological progress.

Either way, the issues raised by the different possible paces of technological progress are important, and it is the case that setting up the production of some particular commodities may indeed further technological progress (Nelson and Winter, 1982; Dosi, Pavitt and Soette, 1990). Without these technology generating industries, the process of technological development can be held back or, alternatively, a country may run the risk of losing the basis for autonomous technological development. Frequently, the technology generating industries have a long maturing process. It is precisely for this reason that it is necessary to start them in the relatively early stages of industrialization.

Clearly, this last element does not retract from the benefits which can be obtained by using the principle of comparative advantage. However, it does demand certain flexibility in order to avoid becoming a rigid and unworkable rule. That is to say, a developing economy should use its comparative advantage to best advantage. As well as this, it should develop a few⁷ industries which will be in a position to generate technological progress, from the start of the industrialization process, and which will have a spread effect on the training of a wider group of industries and workers, even if these industries are capital-intensive.

THE NEOCLASSICAL THEORY OF INTERNATIONAL TRADE

We will now discuss the positive aspect of the principle of comparative advantage, and more specifically the neoclassical theory of international trade, which is mostly embodied in the Heckscher-Ohlin model. The well-known conclusion of the model is that countries will export commodities that are intensive in their abundant resources, and import commodities intensive in scarce resources. An additional conclusion, which is rarely spelled out as

clearly as required, is that productive resources will be fully utilized. It is recognized that, when an economy dismantles barriers to trade, obstacles may appear that cause some resources to get idle, but sooner rather than later, these obstacles will be overcome and those resources will then be productively absorbed.

We shall first review some empirical research on the results achieved about this theory, separating out the two different hypotheses involved. On the one hand, if liberalizing trade ensures that — perhaps after a brief lapse —, resources will be fully utilized. Since no evidence exists about resource utilization, we shall consider a different but closely related question, namely, whether or not economic growth is enhanced thanks to trade liberalization.⁸ On the second hand, we seek an answer to the question of whether or not liberalization changes the pattern of trade more in accord with comparative advantage.

Regarding the second issue, ever since Leontief undertook his pioneering research for the United States, which gave rise to the well-known “Leontief paradox” (he found that, in the USA, the capital-labor ratio embodied in imports exceeded by 60% the ratio embodied in exports), a lot of empirical research has been carried out to test if countries trade according to comparative advantage. The results have been rather inconclusive (Helpman, 1998).⁹ However, the question to which we would like to find an answer is somewhat different, namely, whether or not countries trade more in line with their comparative advantage after trade liberalization than before. To the best of our knowledge, there is hardly any evidence for this. Our own investigation, however, gives a negative answer for Mexico. We found that the opening up of Mexico’s economy to foreign trade between 1985 and 1987 was not followed by a change in trade in accordance to, or by investment efforts more in line with comparative advantage (López and Pérez, 1997). But the results of one single case study cannot, of course, be the basis for a general conclusion on this issue.

We shall now review results pertaining to the effect of trade liberalization on GDP growth. For example, Greenaway et al. (2002) carried out dynamic panel data econometric modeling for a sample of 73 developing countries. They used different indicators of liberalization and included, besides a trade opening indicator, initial GDP, initial schooling, the invest-

ment ratio, population growth, and terms of trade changes, which were all found to be influential in determining cross country patterns of growth. They found that the liberalization effect is initially neutral (or negative), and then positive, tracing out a *J* curve. They thus concluded, “liberalization may impact favorably in growth of real GDP per capita. However, the effect would appear to be lagged and relatively modest” (p. 243).

The Greenaway et al. work can be contrasted with another multi-country analysis. Yanikkaya (2003) carried out a study for 80 countries over the 1970-1997 period, and examined econometrically the relationship between several measures of trade restrictions, along with the commonly used average tariff rates. He found that trade restrictions had a positive and statistically significant effect on economic growth, essentially driven by developing countries.

We refer finally to the results of studies specifically devoted to Latin American economies. In this respect, Lora and Barrera (1998) carried out an econometric study for 19 countries for the 1984-1995 period. With the rate of growth of output as dependent variable, and a trade reform index devised by Lora (1997),¹⁰ as well as the inflation tax, volatility of inflation and the degree of scholarship of the work force as control variables, they concluded that the trade reform had a positive effect on the average rate of growth, either directly or indirectly, through its impact on investment or on labor productivity. However, their inference cannot be taken as conclusive, since their study did not control for other factors that may have an effect on economic growth.

In fact, using also the Lora trade reform index, but with a much wider set of control variables and exploring alternative specifications, Escaith and Morley (2000) carried out econometric research for 17 Latin American countries for the 1970-1996 period to assess the effects of reforms on growth. With regard to trade, they concluded, “trade liberalization and opening to imports tend to negatively affect the rate of growth, controlling for other factors. However, the negative impact of trade reforms on growth is not significantly different from zero, and is not robust *vis-à-vis* other specifications, while we observe a very significant and negative effect on growth of changes in the trade index” (p. 495, emphasis added).

On the whole, the present review leads to the conclusion that the main propositions of the Heckscher-Ohlin model may or may not be complied with in reality, and that the latter is a more likely scenario for developing economies. We will argue below that this is probably because many of the theory's assumptions are generally invalid, particularly in developing countries.

To argue our hypothesis, we will consider the reasoning behind the Heckscher-Ohlin model. Our aim is to show that, when some of its underlying assumptions are subject to small changes, the conclusion that a Pareto optimum will be attained, and more specifically the assumption that resources will be fully utilized, are no longer valid. Furthermore, countries will not necessarily trade according to their comparative advantage. It may be worth pointing out that neoclassical authors have recognized that the conclusion of the model is not immune to changes in the assumptions, so much so that a very interesting analytical apparatus was developed under the concept of domestic distortions, where the consequences of removing some assumptions are studied. The following observations, therefore, are not so much meant to criticize the internal coherence of the neoclassical theory of international trade, as to discuss the consequences of removing some assumptions that are seldom given the importance they deserve. This neglect is particularly important in cases where policy proposals to open up an economy are put forward.

To start with, we assume the existence of an economy that was previously closed, and which is opened up to imports, thanks to the complete elimination of tariffs and other trade barriers. In this situation, the price of commodities in the domestic market will be the same as in international markets. The opening up of the economy will have generally provoked the lowering of the ruling price for each and every commodity, since domestically produced commodities have to compete with imports. However, thanks to the opening up, the price and private profitability for each and every commodity will become the same as their social price and profitability. Moreover, in branches with comparative advantage, prices will fall less than costs, which results in an increase in profitability. The reverse goes for commodities where the country does not enjoy comparative advantage.

If resources were mobile, domestic production in branches where price and profitability had fallen would shrink. This would result in the release of production factors. The latter, however, would be readily demanded in production branches with comparative advantage, where prices that lie even slightly below international prices serve to ensure plentiful demand. Accordingly, imports would drop and additional exports would be generated. The economy would move along its production possibility frontier, no resources would be left idle, and there would be benefits in terms of greater efficiency of the economy.

As can be seen, the equalization of private and social prices and profitability is fundamental in the neoclassical theory of international trade (and in neoclassical economic theory in general). But this is a very general statement, and it seems useful to discuss in more detail what this would exactly amount to. In order to gain insight into the necessary conditions, we will concentrate on only two of them, namely, high elasticity of demand, and high elasticity of supply. In fact, the theory of economic equilibrium usually does not take into account, or alternatively, takes for granted, certain elements of both demand and supply. We are going to present two examples that show that this approach may give rise to misleading conclusions.

Suppose first that the economy's opening up to imports brings about a reduction in the price of some commodities, which results in a reduction in output. In order to achieve a certain degree of realism, we will further suppose that production factors are immobile, but that their income is flexible downwards. Apparently, for the conclusion of the theory, this would not pose a major problem.¹¹ However, an important predicament may in fact appear. Indeed, it may so occur that the fall in factor incomes that follows the fall in production as induced by the opening up to imports brings about a fall in domestic demand. Unless external demand increases sufficiently enough to compensate for that fall, the decline in domestic demand will be accompanied by a reduction of total demand.¹² The result will be that production will fall, as will the utilization of resources.

On the other hand, assume that demand is infinitely price elastic, but that supply is not very elastic. The latter could be the consequence of many factors, for instance, rigidities, asymmetric information, etc. For example, assume that the (potential) improvement in competitiveness and profits of

some industries as brought about by trade liberalization is known to the producers, but not to the banks. In that case, firms in sectors with comparative advantage will not be able to obtain the necessary finance, and production cannot increase (Stiglitz and Weiss, 1981). Accordingly, resources will be released in branches without comparative advantage, but will not be demanded in branches with (potential) comparative advantage; some resources will remain unused, and the (potential) comparative advantage will not materialize, since supply will be unable to respond to the potential increase in profits.

The two previously considered situations lead to the conclusion that price elasticity of both supply and demand must be very high to guarantee that trade liberalization preserves a full utilization of resources. When these conditions are absent, an economy that opens-up to foreign trade will face obstacles to move along its production possibility frontier. It may be the case that production falls below the production possibility frontier, that resources will not be fully utilized, and that the Pareto optimum will not be attained.

In particular, suppose that elasticity of demand is high, so that total demand expands due to liberalization, but elasticity of supply is low. Then liberalization will bring about a mismatch between supply and demand, and a trade deficit will appear. If the latter is persistent, this would require, or even force, sooner rather than later, a contraction of domestic demand and output. Now, this possibility, which cannot be excluded a priori, is hidden from view in the neoclassical story because of its underlying assumptions.

Supporters of trade liberalization sometimes accept that it may bring about a decline in output, due to some less efficient domestic firms being unable to withstand foreign competition, or due to low short-run elasticity of foreign demand, but they apparently believe that the fall will be short-lived. Expansion of efficient industries and of foreign demand, so the argument goes, will sooner rather than later drag with it domestic and aggregate demand, and employ the resources released from less efficient firms, even as it lifts the external constraint. However, this needs not be the case. In fact, if output declines, in the short-run, profits will also be reduced, and the degree of utilization of the productive capacity will fall off. Thus firms will not be stimulated to enlarge their productive capacity with new investments, and no recovery, least of all a strong one, will necessarily take place.

Insufficient price elasticity of demand and supply may also contribute to an understanding of the reason why countries that drastically reduce tariffs and eliminate non tariff restrictions to trade do not necessarily specialize according to comparative advantage. It may be so that demand and supply elasticity are higher for capital-intensive than labor-intensive commodities. But this last problem, namely, that resources are not used in their most efficient way is, at least from the present writer's perspective, of rather secondary importance when compared to the cost and waste entailed when resources are left idle.

SYNTHESIS AND CONCLUSIONS

The above analysis has shown that developing countries can benefit by specializing in production and trade according to their comparative advantage. Of course this should be done in a flexible and not a rigid way, taking into account the technological spread effects of different industries.

Specialization according to comparative advantage would allow a country to reduce its average capital-output ratio, which will open up the possibility of a higher rate of growth of output for any given rate of investment. Alternatively, specialization in labor-intensive commodities will require a smaller share of investment, and will result in a higher rate of growth of consumption for a given rate of growth of output. In both cases, increased employment and consumption in the short term are favored, without medium and long term employment and consumption being jeopardized. It is true that, in order to achieve these favorable effects, employment growth would have to be higher. But this is not an important cost for a developing economy having a large surplus of unemployed labor.

It should be noted that the countries which have grown faster during the postwar period have specialized in accord with their comparative advantage. This is particularly the case of Southeast Asian countries and Japan. There, the pattern of specialization at first favored highly labor-intensive industries — and especially intensive in unskilled labor —, and only at a later stage did it changed in favor of capital intensive industries. This strategy is well reflected in the structure of their foreign trade. To quote one among many studies available, Fujii and Levy (1993) conclude the following about the experience of Korea:

The evolution of the export structure of Korean manufactured goods shows (that)... in the first phase, the export of labor-intensive goods (which could be intensive in either unskilled or in qualified labor) was promoted. In 1971, these goods contributed 58% to exports (broken down by 45.8% unskilled and 1.7% skilled labor, note by J. L.), and, by the end of the 1980's they still represented 49% of all exports (32.3% and 16.6% respectively, note by J. L.).

On the other hand, we have seen that the policy proposal to drastically liberalize trade goes further than the theory of comparative advantage, as it implicitly assumes that, in a freely competitive economy unfettered by government interference, market signals and forces will, on the one hand, ensure full utilization of resources, and on the other, direct production and investment in accordance with its comparative advantage. However, empirical studies on developing economies do not appear to support this conclusion.

Our own review of the logic of the Heckscher-Ohlin model suggests that, in an economy ruled by free competition and without governmental interference, market signals and forces are not by themselves sufficient to provide the necessary incentives to producers so that they fully use the available resources, and produce and trade according to comparative advantage. Developing countries cannot rely exclusively on market forces, and a change in the pattern of specialization to accelerate demand for labor, thus absorbing unemployment, requires State intervention.

Paradoxically, this last statement is much less heterodox than it appears at first sight. Indeed, the analysis of the so-called "internal distortions" drew exactly this conclusion a long time ago, adding that government intervention, through taxes and subsidies, should precisely at the point where internal distortions present themselves (the neoclassical theory of "optimum intervention"). It is indeed a pity that this very interesting branch of the neoclassical theory of international trade seems to have been forgotten today.

NOTES

1. Note, however, that an economy may free from barriers its international trade, and still be characterized by strong State intervention. For an interesting historical illustration on this issue, see especially Senghaas (1985). See also Berend and Ranki (1982), Bairoch (1997), Kindleberger (1978) and Katzenstein (1985).

2. In (4), K_i and Y_i represent the value of capital goods and the value of the product, respectively.
3. We are simplifying the analysis because, as already stated, average labor productivity is a weighted average, where the weights are the shares from each “generation” in relation to total labor.
4. δ_t is a diminishing function of time.
5. Some of these criticisms can be found in Ros (1986), and in Prasch (1996).
6. Spending on education is considered in national accounting as consumption spending. We do the same here.
7. The capacity to establish technologically advanced industries in developing economies is limited because of the relative scarcity of professional and technically skilled labor (Westphal, 1982 and 1990).
8. It can be safely assumed that growth will not be enhanced unless resources are more fully utilized.
9. A part of the research has been theoretical, devoted to widen and refine the model, mostly by extending the number of factors and type of goods considered.
10. The trade reform index elaborated by Lora is the average of two components, the average tariff rate and the tariff dispersion.
11. Johnson (1965) shows in his classic article on the subject that, in order to ensure that the opening up of the economy brings about a movement along the production possibility frontier reaching the Pareto optimum, a necessary condition is the downward flexibility of factor incomes, and not their perfect mobility. In other words, the existence of specific factors does not imply that unemployment will arise; see also Dixit and Norman (1984). It is thus misleading to criticize this theory on the basis that it “typically assumes no cost, or ‘perfect’ mobility of all resources” (Prasch, 1996, 41).
12. Joan Robinson (1980) was probably the first to point out that the neoclassical theory of international trade totally omits any consideration related to demand.

REFERENCES

- AMSDER, A. (1989) “Asia’s next giant: South Korea and late industrialization”. Nova York: Oxford University Press.
- BAIROCH, P. (1997) “Victoires et deboires”. Paris: Gallimard.
- BEREND, I. T. (1982) “The European periphery and industrialization. 1780-1914”. Cambridge: Cambridge University Press.
- DIXIT, A., NORMAN, V. (1984) *Theory of International Trade*. Cambridge: Economic Handbooks.
- DOSI, G., PAVITT, K., SOETTE, L. (1990) “The economics of technical change and international trade”. Nova York: New York University Press.
- ESCAITH, H., MORLEY, S. (2000) “El efecto de las reformas estructurales en el crecimiento económico de América Latina y el Caribe”. Trimestre Económico.

- FUJII, G., LEVY, N. (1993) "Composición de las exportaciones de Brasil, Corea, España y México". *Comercio Exterior*, Sept.
- GREENAWAY, D., MORGAN, W., WRIGHT, P. (2002) "Trade liberalisation and growth in developing countries". *Journal of Development Economics*, v. 67, p. 229-244.
- HARBERLER, G. (1936) "The pure theory of international trade". Londres: William Hodge and Company.
- HELPMAN, E. (1998) "The structure of foreign trade". NBER Working Paper 6.752.
- JOHNSON, H. (1965) "Optimal trade intervention in the presence of domestic distortions". In: R. E. Baldwin *et al.* (eds.). *Trade, growth and the balance of payments*. Rand-McNally and Company, Chicago.
- KALECKI, M. (1969) "Introduction to the theory of growth in a socialist economy". In: Collected works of Michal Kalecki, v. IV, J. Osiatynsky (ed.), Oxford University Press, 1993.
- KATZENSTEIN, P. (1985) "Small states in world markets: industrial policy in Europe". Ithaca, New York: Cornell University Press.
- KINDLEBERGER, C. P. (1978) "Government and international trade". Princeton: Princeton Essays in International Finance.
- LASKI, K. (1966) "The influence of foreign trade on the rate of economic growth". In: *International Trade and Development – Theory and Policy*, Polish Scientific Publishers, Warsaw.
- LÓPEZ, J, PÉREZ, A. (1997) "Ventajas comparativas, comercio exterior y empleo en México". In: J. López (ed.), "Macroeconomía del empleo y políticas de pleno empleo para México". México: Ed. Porrúa.
- LORA, E. (1997) "Una década de reformas estructurales en América Latina: qué se ha reformado y cómo medirlo". Working Paper, Inter American Development Bank, Washington.
- , BARRERA, F. (1998) "El crecimiento económico en América Latina después de una década de reformas estructurales". *Pensamiento Iberoamericano* (edición especial).
- MYRDAL, G. (1956) "An international economy". Nova York: Harper and Row Publishers.
- NELSON, R., WINTER, S. (1982) "An evolutionary theory of economic change". Cambridge, Massachusetts: Harvard University Press.
- PRASCH, R. (1996) "Reassessing the theory of comparative advantage". *Review of Political Economy*, v. 8, n. 1.
- PREBISCH, R. "Commercial policy in underdeveloped countries". *American Economic Review*, Proceedings, v. 49, May.
- ROBINSON, J. (1980) "Reflections on the theory of international trade". *Collected Economic Papers*, v. 5, MIT Press, Cambridge, MA.
- ROS, J. (1986) "Economic growth, international trade and the pattern of specialization". *Political Economy*. Studies in the surplus approach, n. 3.
- SACHS, I. (2004) "Desenvolvimento incluyente, sustentável, sustentado". Rio de Janeiro: Garamond Universitária-Sebrae.

- SENGHAAS, D. (1985) "The European Experience. A Historical Critique of Development Theory". Leamington Spa/Dover, New Hampshire: Berg Publishers.
- STIGLITZ, J., WEISS, A. (1981) "Credit rationing in markets wit imperfect information". *American Economic Review*, Jun.
- WADE, R. (1990) "Governing the market: economic theory and the role of the government in East Asian industrialization". Princeton: Princenton University Press.
- WESTPHAL, L. (1982) "Fostering technological mastery by means of selective infant-industry protection". In: M. Syrquin, S. Teitel (eds.), *Trade, Stability, Technology and Equity in Latin America*. Nova York: Academic Press.
- WESTPHAL, L.(1990) "Industrial policy in an export-propelled economy: Lessons from South Korea's experience". *Journal of Economic Perspectives*, 4.
- WORLD BANK (1987) "World development report". Washington DC, World Bank.
- YANIKKAYA, H. (2003) "Trade openness and economic growth: a cross country empirical investigation". *Journal of Development Economics*, 72 (2003), 57-89.