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Productivity, Welfare, Growth and Competitiveness

By

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ABSTRACT - This article introduces and relates the notions of productivity, welfare, competitiveness and growth. It is attempting in this manner to provide an overall analytical framework for a better interpretation of the meaning of the multifactor productivity measures published by Statistics Canada in the wider contexts of the analyses of competitiveness and welfare. This analytical framework is also used to assess alternative views on competitiveness and its indicators.

RÉSUMÉ - Cet article présente et relie les notions de productivité, de bien-être, de compétitivité et de croissance. Il tente ainsi de fournir un cadre analytique d'ensemble permettant de mieux interpréter la signification des mesures de productivité multifactorielle publiées par Statistique Canada dans les contextes plus amples de l'analyse de la compétitivité et du bien-être. On utilise également ce cadre analytique pour évaluer diverses vues alternatives sur la compétitivité et ses indicateurs.

1 - Introduction

The purpose of this article is to appraise the analytical interpretation and usefulness of the productivity accounts produced by Statistics Canada[1]. The article attempts to bring together the notions of productivity and welfare and of productivity, growth and international competitiveness. The concept of productivity involved here corresponds to the concept of efficiency of the processes whereby the primary production factors, namely capital and labour, are transformed into various goods and services. It is thus a matter of total factor productivity, which theoretically increases only for reasons associated with technological change[2].

The total factor productivity accounts are normative in nature, as are - to a lesser extent, perhaps - the other components of national accounting as they center on the analysis of the efficiency performance of the economy. Performance analysis would for this purpose apply various evaluation criteria. These criteria may be objective, as, for example, in comparing the productivity of Canadian industries with that of corresponding industries in other countries. This performance analysis then falls within the broader framework of competitiveness analysis[3].

The evaluation criteria may, on the other hand, be more subjective, as in the analysis of welfare. The measurement of welfare calls upon the notion of a social utility function. This

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1. See Statistics Canada, Aggregate Productivity Measures, cat. 15-204.
2. It primarily a matter of the economies of scale which characterize the technology in a given period or the technological progress which characterizes its change over time.
3. The very notion of competitiveness, while highly popular, is not without problems, as will be seen below. Many authors, such as Markusen (1992, p. 6) even see a problem in using this term, given the many meanings attributed to it.

function measures, in ordinal fashion, the welfare of a society by weighting the utility functions of its members. One may, however, following Fisher (1930), analyse welfare on the basis of the more objective measure of the aggregate level of consumption. The higher aggregate consumption is, the higher, it may be assumed, will be the society's level of welfare, although this welfare depends on the distribution of such consumption among the members of the society and the weight assigned to its members in the social utility function.

In addition, productivity analysis is one of the major foundations of the analysis of long-term economic growth. Indeed, the purpose of the productivity accounts is to separate out the contribution of the factors of production, which represent a cost, from the other factors which underlie growth, such as technical progress, and which are grouped together in the residual of multifactor productivity. Even in a closed economy, it is important to study productivity in order to identify the factors that contribute to it and thus be able to act, through appropriate policies, on the growth of the economy.

Initially, then, the study of productivity appears to be of fundamental importance, both for studies on growth and competitiveness and for welfare studies. This is what we shall attempt to explore further in the paragraphs below. The following section takes a general look at the relationship between productivity and welfare. Section 3 examines the concept of competitiveness between countries, starting from the concept of competitiveness between business firms. This is followed by an analysis of the relationship between productivity, competitiveness, welfare and growth. An analysis of several alternative views of competitiveness is then presented. Section 6 provides a brief review of several hypotheses that seek to explain the relative performance of different countries. This is followed by a few conclusions.

2 - Productivity and welfare

Above, welfare was provisionally defined by the level of consumption. This concept of welfare is restrictive, not only because it ignores certain realities such as income distribution, as already noted, but also and above all because it does not take account of the fact that consumption depends on the sacrifices - in saving and leisure time - that are necessary to support it. This leads us to suggest here a more comprehensive concept of welfare as a cost-benefit ratio between, on the one hand, the efforts expended to support production, and on the other hand, the benefits that society derives from its consumption. This is a concept, then, that brings together the notions of welfare and efficiency.

This cost-benefit ratio is in a sense an expanded performance or efficiency measure which may be identified as the fundamental measure of productivity and at the same time the fundamental measure of aggregate welfare[4]. Of course, the distributional aspects are not immediately taken into account by what occurs in the production system other than by

4. This idea would seem not to be a new one, as it can be found in the writings of Ricardo. As Blaug (1962 and 1968, p 118) reports, "For Ricardo, `value' is an inverse index of the average productivity of labor and therefore of economic welfare; welfare is a matter of minimizing human effort per unit of output."

the relationship between efficiency and factor payment. But the fact remains that in this perspective, the growth and measure of productivity do not affect the growth and measure of welfare. Rather, they are one and the same[5].

To be sure, the traditional measure of welfare associated with the level of consumption can be broadened by expanding the basket of goods consumed to include leisure time. Labour then become endogenous. But it is less clear that the basket can be expanded to include the postponement of gratification which saving requires, and which defines it[6]. To endogenize saving, it is necessary to introduce future consumption into the social utility function as well as a factor of equivalence between present consumption and future consumption - a discount rate[7], in a sense. Only then will the two measures of welfare - the one conceived in terms of consumption and the one developed above as being a cost-benefit ratio - be equivalent.

Already the traditional concept of economic efficiency encompasses the concept of technical efficiency and at the same time transcends it, adding to it the minimization of costs in the perspective of a long-term equilibrium. Here this concept is further expanded by including, in the results of production activity, not only the support for current consumption of goods and services but also the accumulation of capital.

In a dynamic perspective with an unlimited time horizon, this amounts to considering that the performance standard for production activities relates to the sustainable path of consumption over time, the boundary of which is hence delimited by net national income, that is, current consumption augmented by net capital formation. Between two societies which, all things being otherwise equal, at a given point have the same level of consumption, it is the one that accumulates the greatest wealth that will eventually be able to sustain the highest level of consumption[8].

The expanded efficiency standard that we have just developed thus serves to impose a standard on the measure of production activity itself and shed new light on an old debate: that of choosing between the gross domestic product and the net domestic product as an aggregate measure of the activity of the economy. As we know, ecologists, for example, have often suggested that in calculating the gross domestic product it is necessary to deduct the value of the consumption of natural resources and, more generally, the costs caused to the environment by production activities. The expanded concept of efficiency proposed here tends to support their hypothesis.

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5. Excluding potential short-term effects associated with changes in the terms of trade. See Diewart and Morrison (1986).
6. Saving amounts to deferring one's present consumption in favour of future consumption.
7. This discount rate may be seen as the price of future goods in relation to the price of present goods, but an equivalent, although less usual, way of representing it is as a volume ratio, with future goods being in a way depreciated in relation to present goods.
8. For a more extensive discussion of this issue, see Durand R. (1993b).

3 - Alternative Concepts of Competitiveness

Microeconomic concept

If the notions of productivity and welfare are relatively clear, the notion of competitiveness is much less so. In general, competitiveness refers to the relative performance of competitors in the marketplace. For business firms, being competitive means doing as well as their competitors in the marketplace. This is measured in various ways, primarily through relative prices or market shares. In general, a business firm is said to be competitive if its manages to sell at the same price or for less than its competitors or if it manages to maintain or increase its market share.

On the domestic market, business firms in a competitive situation must pay the same prices for their factor inputs, and hence it is only by acting on their efficiency that they can compete with respect to the price of their products. Price competitiveness between business firms depends solely on their relative efficiency.

The question is whether this notion of competitiveness can apply to international trade between countries as fully as it does to business firms. To be sure, the companies in various countries are in competition among themselves as much on export markets as on the domestic market. One can thus, for countries as for business firms, calculate relative prices for various goods and services tradable on international markets as well as their market shares, and one can speak of their competitiveness. But the relative prices of goods traded on international markets also depend on the evolution of the exchange rates of the various currencies, which introduces a major additional dimension into the analysis.

Microeconomic competitiveness, at the international level as well as at the national level, is differentiated according to the goods and services produced. Some firms or industries, by increasing their relative productivity in relation to foreign competitors more than other firms or industries, thereby increase their competitiveness on the domestic market as well as on the international market. By contrast, the other firms or industries see their comparative advantages reduced. This is one way of looking at the law of comparative advantages in a dynamic and microeconomic perspective. Economies can increase their relative strengths in some sectors and can weaken in other sectors.

When one looks at things from the latter perspective, which clearly differentiates the goods and services traded on international markets, one realizes that these goods and services in a sense have their own exchange rate. These exchange rates are none other than purchasing power parities, that is, the relative price levels of each good or service in a common currency. Thus, microeconomic competitiveness analysis must involve a fine-grained analysis of the various goods and services traded on international markets after their quantity and price have been converted into common units of measurement. The unit prices of tradable goods, expressed in a common currency, for identical quantities with the same qualitative characteristics, are one of the most fundamental indicators of the specific competitiveness of each of these goods. Thus in a microeconomic perspective,

purchasing power parities and international market shares would be the most fundamental indicators of competitiveness specific to each of these. But competition also operates in other ways that would take too long to discuss here. We would simply mention the knowledge of markets, qualitative differentiation of products, publicity, access to and control of major distribution channels, linguistic and cultural affinities, etc.

It should immediately be added, however, that unlike competitiveness on international markets, competition between countries for specific goods depends on the evolution of exchange rates. Since these rates are not subject to the control of individual entrepreneurs, the latter may see the price of their goods fluctuate on foreign markets independently of their will and, more particularly, of their efforts to increase their productivity and reduce their production costs. Thus microeconomic competitiveness on the international scale depends not only on factor prices and efficiency gains but also on changes in exchange rates. Hence competitiveness may be artificially maintained by a devaluation of the national currency.

In a microeconomic perspective familiar to entrepreneurs, the latter can perceive advantages to devaluing the national currency, whereas these advantages have no real counterpart for economic agents in general. Devaluation of the currency gives rise to the possibility of either reducing prices abroad while maintaining the same prices in the national currency or raising prices in the national currency while maintaining the same prices in foreign currencies or a combination of the two. In all these cases, the effect is to improve business firms' profit prospects, and hence for many observers there is an apparent improvement in the competitiveness of the economy as a whole.

Macroeconomic concept

In macroeconomic terms, this is unfortunately only an illusion, other than for short-term real gains which might be realized in an economic downturn as a result of the stimulation of foreign demand for export goods. In actual fact, the devaluation of the currency also causes an increase in import prices and a decrease in the real income of consumers, most of whom are workers. The main effect of the devaluation is thus to bring about a redistribution of income in favour of business firms at the expense of workers. Under no circumstances can it support the long-term expansion of real incomes, as is the case with productivity.

From a long-term perspective, devaluation is instead much more likely to create tensions with respect to income distribution, which will be reflected in wage increases and generalized inflation unless the latter is countered by restrictive macroeconomic policies. In either case this will bring the economy more or less back to where it started.

Thus there are a number of major differences between business firms and countries, and because of these differences the concept of competitiveness between firms does not apply as such to countries, at least from a macroeconomic perspective. In the first place, the competitiveness of a country on the international market, if measured simply in terms

of relative prices of domestic goods in relation to foreign goods for comparable and tradable goods, would appear to depend on both the evolution of exchange rates and the evolution of the structure of the relative prices of the various goods in the trading countries. Canada's international competitiveness depends, at its outer lines of defence, on the evolution of the currency exchange rates that serve to determine the price of Canadian goods in relation to foreign goods in a common currency.

However, exchange rates do not provide only common units of measurement of the value of goods in different countries. Quite to the contrary, they act as locks (in the sense of the gated chambers in a canal system) to equilibrate trade between countries. Trade tends to come into balance when the locks are open, that is, when there are fluctuating exchange rates, determined solely by private demand for and supply of the various currencies on the international market. But governments can - and often do - intervene to control exchange rates. Where they are strictly controlled, exchange rates remain fixed and no longer serve to equilibrate commercial exchanges between countries.

In a perfectly flexible exchange rate system, a country cannot increase its competitiveness, in the sense of reducing all its prices relative to those of competitor countries, by increasing its productivity more quickly than its trading partners. This would mean, in effect, that it would continually increase its sales abroad while cutting back its own purchases from foreign countries, meaning that it would continually expand its trade surpluses. With flexible exchange rates, the relative appreciation of its currency in relation to foreign currencies would quickly restore its trade balance and bring relative prices into equilibrium.

These, however, are conclusions that emerge from a first level of analysis, which ignores the fact that exchange rates do not serve to balance only commercial exchanges, but more broadly, all exchanges between countries that have a currency exchange. If the door is thus opened to capital flows, these flows can themselves offset the flows of goods and services in commercial exchanges without there being any change in exchange rates. The latter measure the relative prices of the various currencies in terms of their supply and their aggregate demand, which in turn depends fully as much on capital flows as on trade.

Thus exchange rates introduce two major differences between price competitiveness on the domestic market and on the international market. First there is the idea of globalization, according to which the competitiveness of one producer depends as much on the competitiveness of the other producers in the various industries as on the movements of capital that globally determine the changes in exchange rates, and second there is the idea that price competitiveness and market share are based as much on these changes in exchange rates as on the real strengths of the competitors.

On the domestic market, competitors theoretically pay the same price for their factor inputs. However, a business firm may, by increasing its efficiency more than its competitors, "vanquish" them and in so doing, contribute to the general increase in the productivity of the economy and hence of the general welfare. Its commercial success at the international level does not necessarily have the same meaning. Such success may

be based on a mere devaluation of the currency, which results in no creation of wealth but a mere redistribution of income in the business firm's favour. The productivity gain in relation to foreign business firms is obtained by a transfer of income from workers to entrepreneurs, without there being any creation of real wealth.

A third major distinction results from the fact that the very survival of the firm depends on its competitiveness, whereas this is not the case for a country. A country can continue to exist when the relative performance of its business firms declines in relation to the performance of competing foreign business firms. The gradual decline of its currency may artificially maintain its prices and its market share; its level of economic activity may even remain sufficient to ensure full employment of its resources. The changes in exchange rates totally offset performance differentials with respect to productivity or the differences in inflation levels. But this brings higher prices on the domestic market and an at least temporary redistribution of income, and not higher living standards. For a country, the lack of competitiveness -- not in terms of relative prices and market share, but in the sense of the loss of relative efficiency -- tends much more to be measured by the relatively low increase in the real incomes of its inhabitants. For this reason, the concept of competitiveness on the international level is often associated with the level of welfare. For example, Markusen (1992, p.8) offers the following definition:

> "**Competitiveness: A Normative, Macro Definition** A country is competitive if it maintains a growth rate of real income equal to that of its trading partners in an environment of free and (long run) balanced trade"

For our part, we would be tempted to characterize the competitiveness that results solely from changes in exchange rates as nominal or apparent competitiveness as opposed to the competitiveness that results from the supply of factors on the domestic market and the increase of efficiency -- in other words, fundamentals that sustain growth. This could be called real competitiveness. The latter is the only kind that can contribute to the growth of real incomes in the long run. This concept is similar to Markusen's except that it adds the "sports" connotation of doing better in this regard than one's trading partners.

To summarize, from a macroeconomic perspective, the competitiveness of a country is measured to a much greater extent by the relative change in the standard of living of its population than by the price of its products or its share of the international market for various goods and services. The standard of living is itself very closely related to the evolution of productivity, as was seen in Section 2. If we wanted to draw a parallel, we could associate real or macroeconomic competitiveness between countries at the international level with their efficiency, just as in the case of competitiveness between business firms competing on the domestic market.

One final point: the profound meaning of competitiveness between business firms, which is that of business firms fighting for their survival, does not really apply to countries. Not only is their survival not at stake, but countries have, on the contrary, an interest in participating in trade insofar as such trade enables all partners to derive benefits through a greater specialization of their production activities. Thus competitiveness between

countries should instead be seen as more of a game between partners than as a struggle between adversaries.

4 - Productivity, competitiveness, welfare and growth

The latter paragraphs lead us to consider that, in a macroeconomic perspective at the very least, aggregate competitiveness has perhaps no other meaning than to reflect the change in the relative performance of various production activities of trading countries and, more generally, to reflect their relative growth. Rapid growth associated with the judicious use and assignment of scarce resources is, all in all, the true performance criterion with regard to which trade activities themselves must be evaluated. Insofar as these activities favour absolute growth (the full employment of productive resources), as well as the growth of productivity, they support improvement in overall welfare.

Earlier, we established as reasonable the idea that competitiveness analysis brought to bear the same variables as growth analysis, namely efficiency (in an expanded sense of the term) and the availability of primary factors. From there to establishing an equation between competitiveness and growth there is only one further step.

This step appears to have already been taken, by economists such as Harris and Watson (1992), who have focused on analysing three recent views of competitiveness, namely those of Porter, Reich and Thurow. At the outset, Harris and Watson tackle the question of what it is that we are primarily seeking to optimize. In the language of economists, the answer is, of course, welfare. In the less formal language of business persons and various other groups concerned with economic matters, it may be a matter of maximizing things such as the trade surplus, the market share of Canadian products abroad, the value-added content of our exports, etc. It is not unusual to see such objectives expressed in economics-oriented newspapers and periodicals, for example.

But aggregate growth is generally also what most participants in the competitiveness debate have in mind, either explicitly or otherwise. Why, after all, would we want to maximize our market share or our value-added content, if not to increase employment, income and welfare? To be competitive, it would seem, is associated, in the popular debate, with the full use of our resources and especially our labour, and with success in high-tech industries. Why these industries, if it is not that they are industries of the future that generally pay high salaries and realize equally high profits? And it is only because they are highly productive that these industries so generously pay the primary factors.

There could thus be two alternative visions of competitiveness, depending on whether the emphasis is on overall growth or raising the standard of living. Countries' competitiveness on the international scale could basically be measured, from a macroeconomic perspective, by their relative overall growth, which for its part depends on the evolution of their productivity and the availability of their primary inputs. However, to the extent that what matters is qualitative rather than quantitative growth, competitiveness should

instead be measured by relative levels of welfare, that is, in the final analysis, by relative levels of efficiency.

5 - Alternative views

Whatever the case, this leads us to propose two basic equations. The first is the equality between the notion of efficiency and that of welfare, for a given income distribution. The second is the equality between the issue of growth and the one of real macro economic competitiveness. But when we consider leisure and the preference for present consumption as items in the consumption basket, it leads us to the maximization of relative growth rather than the maximization of absolute growth, or, in the final analysis, the maximization of efficiency or of what others would call qualitative growth. To be competitive, in real terms, it would seem to be necessary to maximize efficiency or welfare. Thus these three themes of analysis could be completely superposed, with a single equation rather than two.

But from this no immediate conclusions may be drawn as to maximization of industry value-added or maximization of export market share. Favouring the growth of so-called high-value-added industries is due to a limited understanding of the functioning of society's productive apparatus. Any delivery to final demand in the economy and, in particular, any delivery so greatly appreciated and recommended on the export markets, is only pure value-added, even though a part of this value-added may come from the contribution of imported factors of production.

This popular maxim is perhaps due to the largely artificial division of the economy's production activities into industries. Each industry contributes only partially to the value-added of goods and services delivered to final demand by the use of its capital and its labour. The value of goods and services delivered to final demand also depends on the contribution of purchased factors, which in the jargon of national accounting are called intermediate purchases. To maximize value-added at the industry level is to minimize the purchase of intermediate factors so as to maximize the value-added content specific to the industry. But what are purchases of intermediate goods and services, if not the value-added of upstream industries? What then remains of this popular maxim, considering that the division of production activities by industry is purely artificial?

What should be maximized, it appears, is the content consisting of domestic primary factors, as opposed to primary factors indirectly imported in the form of intermediate inputs of goods and services[9]. But once again, what is the merit of maximizing, in the production of each good or service, the domestic value-added? Should not the value of these imports be gauged only in terms of the criterion of efficiency? But what difference does it make whether foreign factors are used if this contributes overall to our efficiency through a better use of our resources for other purposes?

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9. This proposition is also to be found in the theories, long popular in Latin America, of development based on import substitution.

Of course, one could argue here for instead using the more macroeconomic criterion of job creation. But does not job creation depend in part on our competitiveness, that is, the efficiency of our use and allocation of resources? And does it not depend more fundamentally on the more or less harmonious functioning of factor markets and macroeconomic policies for achieving economic equilibrium?

The maximization of value-added at the aggregate level does not consist, in all cases, in maximizing the value-added of each product delivered to final demand, but rather in maximizing the value-added of the economy as a whole through the allocation of productive resources to activities with the highest productivity for which, furthermore, we possess comparative advantages on the international market. International specialization may call for importing factors of production in many sectors. In other words, industrial clusters, so often discussed these days, potentially have, or ideally should have, transnational ramifications.

In a macro economic perspective, the analysis of the market share of exported goods on international markets quickly reaches its limits for similar reasons. Why seek to maximize our share of markets for products - such as clothing, for example - which generate activities in low-efficiency industries? Once again such prescriptions should be more selective.

It is hardly surprising, furthermore, to find that there is no correlation between the degree of openness of economies and their successfulness as measured by indicators such as the per capita net domestic product (NDP), for example. The importance of external trade for a given country depends on a host of factors, including in particular its resource endowment and the size of its domestic market. Some countries, such as the United States, have attained high levels of efficiency and welfare for many decades despite a relatively low level of external trade in relation to their NDP as compared to other less fortunate countries. External trade is not in itself a panacea for growth problems, and the maximization of market share, whether by product or more generally, has no particular prescriptive value.

Thus microeconomic indicators of competitiveness, market share and purchasing power parity, are imperfect indicators of the relative performance of economies with respect to their global growth and efficiency. For instance, a decrease in the importance of international trade in a given country in itself is not a symptom of endemic illness, although it can signal a loss of relative importance. But once again, when one is a front-runner, is losing some of one's lead so serious? Rather, is it not inevitable and even desirable?

6 - The Catch-Up Hypothesis

This hypothesis refers to the fact that the differences observed in the evolution of productivity between countries would seem to be linked to differences in levels of productivity. According to this hypothesis, countries with a low level of productivity experience high growth of their productivity by acquiring technologies from more

developed countries to which they tend to catch up by way of imitation, whereas leading countries advance only be investing in research and development of new technologies. This hypothesis is an attractive one in that it would seem to explain the very rapid growth of many countries in recent decades. We speak of the Japanese miracle, or the Korean miracle, for example. However, this hypothesis is not sufficient to explain everything, since many Third World countries are still waiting for their take-off. Other factors, as yet unknown, would therefore seem to be in play.

Numerous sociological factors would appear to act on the capacity and will of a society to take off and to catch up to the more advanced countries. In addition, differences in how productivity evolves, by favouring differences in how factor payment evolves, can also thereby cause these factors to move from one place to another. This is especially true for capital, which circulates quite freely among the developed countries. Administrative know-how usually immigrates with capital when the latter moves in the form of direct investment abroad. This is one of the many channels by which technical progress is disseminated among countries. But the emigration of manpower is also a major factor which often has the effect of slowing down the advancement of developing countries. Their skilled manpower, lured by more attractive remuneration, is often drained off to more developed countries.

On the other hand, by maintaining relatively low prices on the international market (owing to its relative efficiency and the prices of its primary factors) a country can apparently achieve high trade surpluses, which are themselves offset by direct investment abroad in a situation where exchange rates are perfectly flexible. Despite the gradual rise in the value of the yen, this example cannot help but remind us of trade in recent decades between Japan and its trading partners.

This example brings another dimension into the analysis. The current account surplus can be eliminated only by an equivalent deficit in the capital account. This deficit itself assumes a sufficient domestic savings flow[10]. Without these savings, the balance of payments deficit would result in the fall of the exchange rate and the working out of a new trade equilibrium. But these savings show the will of the mass of individuals to move forward by deferring their consumption for the benefit of future generations.

This dynamic implies the coming into play of real forces that influence the evolution of exchange rates, by way of both the balance of capital movements and the current account balance. Exchange rates would appear to depend doubly on the relative real strengths of the economies involved, for they depend firstly on the growth in these economies' supply of primary factors and secondly on the evolution of technical progress. In short, the maintenance of high industrial growth, as in the case of Japan and many other Asian countries, cannot rely solely on pure price competitiveness. It involves other variables such as saving: saving must be sufficient not only to absorb the trade surplus by

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10. It could also be absorbed in part by issuing currency that serves as an international currency in the framework of expanding trade.

investments abroad, but also to support the growth of the domestic capital stock required for industrial expansion itself. It also involves an expansion of available labour.

The required growth of the primary factors in the national economy may, however, be mitigated by strong growth of productivity. However, the causal link might go in the opposite direction. Investment may be considered as deferring to the future the use of resources that could have been used in the present to increase the production of consumption goods. But why would one want to defer the use of productive resources to the future without deriving the benefit of increased production? In other words, investment would itself appear to depend on expected productivity gains. Thus the growth of productivity could provide a major support to the will to save and an explanation of the rapid growth of investment, and not the opposite, as is often assumed. Without major prospects of technological improvements, investments would probably be much less substantial. Countries which are catching up technologically, and which can therefore obtain greater benefits from new investment, could well be the countries in which savings rates are the highest.

What is operating here, clearly, is a dynamic which tends to run down and which can sooner or later lead to its own end. This end could result - this is a double hypothesis - on the one hand, from the gradual rise in the standard of living that is brought on by the rapid increase in productivity and, on the other hand, from the reduction in the perspectives of technological gains. Thus, to be more competitive, the economy needs innovations and a strong supply of work and savings. These primary inputs negatively affect the level of welfare, as we have just seen, whereas technical progress positively affects it. It follows that a society may choose to voluntarily reduce its level of welfare in order to support its "competitiveness" and its commercial expansion, particularly since the prospects of technological gains are tempting.

With the gradual rise in the standard of living, it can be expected that leisure will take on more importance, and accompanying this leisure, the consumption of goods and services will rise. An increase in leisure and consumption means, all things otherwise being equal, a reduction in hours of work and in saving. A rise in the standard of living can thus lead to a change in the behaviour of economic agents and a reduction in the supply of primary factors, which would slow down the growth rate. Reduced prospects for major technological gains would serve to reinforce this trend.

Thus people often speak of the Westernization of the lifestyle of Asian peoples. Might this phenomenon lead to a reduction in the propensity to save and work among the Japanese, gradually leading Japan on a path of less rapid growth, more similar to the group of front-running nations that it will have joined? Japan, like many European countries, experienced rapid growth for several decades, seemingly attributable both to technological upgrading and to the determination of that country to regain the standing that it had prior to World War II with regard to the wellbeing of its population in relation to the richest countries.

Once the target is reached, will there be a desire to go beyond it? Or, as seems more likely, will people in both Japan and the Western European countries maintain the rank while gradually reorienting the system toward more consumption and less saving? It is of course difficult to guess the future and find the answer to such a question. What seems certain is that one of the levers of accelerated growth of these countries will no longer be able to operate, namely the technological upgrading that kept the rates of productivity growth in those countries at a higher level than in the front-running countries such as Canada and the United States. According to the catch-up hypothesis, we should now expect to see an equalization of technical progress among the industrialized countries, and consequently a reduction of the growth disparities among them. Growth could also become more uniform as a result of more similar patterns of population growth and growth of the labour force in the developed countries and perhaps, as mentioned above, as a result of increased uniformity of economic behaviours and attitudes. We are nevertheless still very far from being able to answer these questions with any certainty.

7 - Conclusion

In this article, we have tried to articulate an analytical interpretation of the concept of economic efficiency and to relate this concept to the concepts of competitiveness, growth and welfare. We put forward two equations, namely the equality between efficiency and welfare for a given income distribution, and the equality between real or macro economic competitiveness and the relative growth of countries.

In pushing the analysis only a little further by considering that what matters most is to maximize qualitative growth rather than absolute growth, we have managed to bring these three themes of analysis back to the theme of efficiency. The analysis of competitiveness at the macroeconomic level thus consists in analysing relative efficiency levels among countries or, what amounts to the same thing, analysing their relative levels of welfare. This furthermore led us to specify the notion of competitiveness at the international level and, following Markusen in this regard, to make a distinction between microeconomic competitiveness and macroeconomic competitiveness.

The competitiveness of Canadian producers on international markets, measured, according to the microeconomic concept, by the relative prices of their products in foreign currencies or by their market share, can be maintained by the devaluation of the currency fully as much as by an improvement in their productivity. The evolution of currency exchange rates would nevertheless appear to be linked to the real strengths that support overall growth, so that the notion of competitiveness on the microeconomic scale could ultimately be closely linked to the notion of competitiveness on the macroeconomic scale. It should be noted that the latter depends on efficiency, which is also the gauge of relative performance of business firms on the domestic market. Competitiveness between countries, unlike competitiveness between business firms, nevertheless brings into play all the strengths present in all sectors, and their combined action would seem to influence the evolution of exchange rates. By contrast, exchange rates are beyond the control of individual business firms.

For our part, we have timidly advanced the hypothesis that the historical catch-up of various rapidly developing countries found its limit not only in the gradual slowing of technical progress but also in a gradual transformation of the behaviour of economic agents, more specifically in a gradual decline in their propensity to work and save, which might itself result as much from the rise in welfare as from the reduction in expected technological progress. In short, our view of the relationship that characterizes the processing of factors into goods and services - generally perceived as an objective relationship, technical in nature - should perhaps, in the final analysis, be only the reverse view, that of the more subjective relationship of utility.

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