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Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

## A Note on the Competitiveness Debate

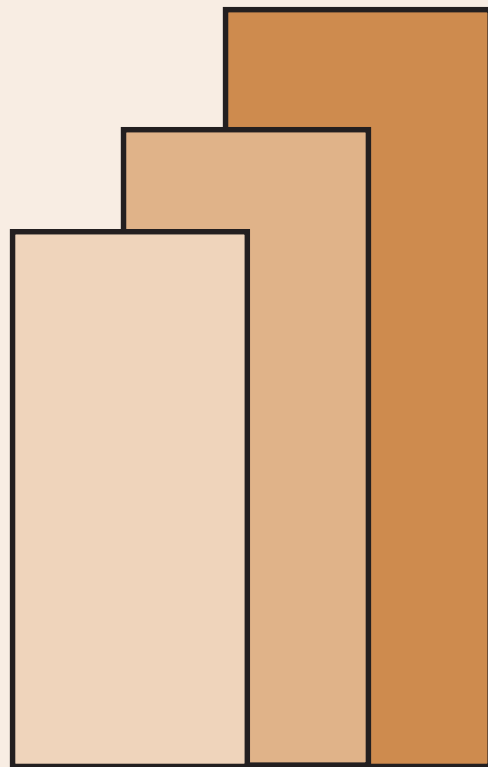
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## A Note on the Competitiveness Debate

*Josef T. Yap*<sup>1</sup>

### **Abstract**

Competitiveness is technically a firm level concept. However, it is oftentimes extended to the national level—the idea of a country’s ‘international competitiveness’—with the following analogies: market share→export share of country; price→real effective exchange rate or unit labor cost; profitability→long run economic growth. The concept of national competitiveness is faulty, in the words of Paul Krugman it has become a ‘dangerous obsession.’ However, national or government policies do have an impact on firm level competitiveness. The only concept related to firm level competitiveness that can be extended to the national level without ambiguity is technological capability. Meanwhile, the Global Competitiveness Report (GCR) presents two measures of national competitiveness: the Global Competitiveness Index (GCI) and the Current Competitiveness index (CCI). The GCI is simply a measure of a country’s potential for economic growth which is not equivalent to competitiveness. The CCI is an exercise in tautology. It simply shows that countries with a higher level of development are ‘more competitive.’ The issue of the appropriate development policies is not addressed. Since technological capability is at the heart of competitiveness, countries must address this issue squarely. One course of action is to adopt a strategic approach to foreign direct investment—as opposed to a passive strategy—similar to what Malaysia and Singapore did.

Key Words: Competitiveness, technological capability

### **I. Defining Competitiveness**

Competition is at the heart of the capitalist paradigm of economic development. Insufficient competition in key sectors or lack thereof has been blamed by pundits for the economic stagnation in many developing countries. Not surprisingly, policy recommendations offered by most multilateral institutions—the Washington Consensus being a prime example—have centered on promoting competition as the key to economic development. The acceleration of globalization, particularly in the flow of goods and services, is a reflection of this policy disposition.

In this context, economic success has been closely associated with the level of competitiveness, i.e. the ability to compete. However, there has been controversy in defining the relevant entities involved and the corresponding concept of competitiveness. Specifically, while “competitiveness” is readily defined at the firm level, the concept becomes a bit vague when applied at the industry and national level. At the firm level, the view of competitiveness can be given as (Buckley, et al., 1988):

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“A firm is competitive if it can produce products and services of superior quality and lower costs than its domestic and international competitors. Competitiveness is synonymous with a firm’s long run profit performance and its ability to compensate its employees and provide superior returns to its owners.”

Hence, a firm’s competitiveness can be measured by its relative price, market share, and degree of profitability over a relevant period of time. If the firm is an exporter, market share can be measured at the global level. Product quality can also be assessed and compared.

Many analysts—mostly non-economists—have extended this concept directly to the national level. For example, national competitiveness has been defined as the "ability of a country to produce goods and services that meet the test of international markets and simultaneously to maintain and expand the real income of its citizens."<sup>2</sup> This definition is consistent with the term “international competitiveness,” bringing to mind President Clinton’s remark that each nation is “like a big corporation competing in the global market place.” The rapid pace of globalization has definitely reinforced this perspective.

The analogy implies that countries compete with each other for shares in the global export market and the equivalent of “profitability” at the national level would be sustained economic growth. Meanwhile, the counterpart of “price” at the macroeconomic level would be measures such as the real effective exchange rate and unit labor cost. For example, an appreciation of the country’s currency in real terms or increase in its unit labor cost would lead to a decline in national competitiveness.

### *Problems with the Concept of National Competitiveness*

Extending the concept of competitiveness from the firm level to the national level thus seems like a rather straightforward process. However, closer analysis would reveal several problems with this approach. One, countries do not necessarily compete with each other when engaging in international trade. More often than not, international trade is a positive sum game where all countries that are involved benefit. This is the fundamental tenet underlying the traditional theory of international trade based on comparative advantage. Hence, a falling share in exports in a particular commodity does not necessarily imply a loss of national competitiveness, but simply shifting comparative advantage. However, the statement that a country is less competitive in a particular sector does have significance.

Two, even if a country consistently experiences a persistent trade deficit, meaning that its exports continually lag behind its imports, this does not necessarily imply that its firms are losing competitiveness. The US has been recording a trade deficit for the past decade or so, but this hardly matters since 90 percent of output is sold on the domestic market. Meanwhile, for a typical developing country, a trade deficit would likely imply that it is

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<sup>2</sup> Cited by Haque (1995) and attributed to the US Commission of Industrial Competitiveness.

applying an intertemporal budget constraint—mortgaging its future for a chance to expand its economy in the present. Thus, using trade performance to gauge an economy's competitiveness should depend on the nature of the economy or its stage of development. For example, comparing Singapore and the US based on trade performance is a meaningless exercise.

Three, economic growth emanates from many factors apart from an increase in exports. If national competitiveness is interpreted in very broad terms so as to encompass total output growth, it simply becomes a development or growth strategy, and ***there is no need to consider it separately*** (Lall, 2001). Hence, not all policies associated with an acceleration of economic growth should be classified as strategies to increase competitiveness.

Four, the bulk in exports can come from resource endowments, like Indonesia and Malaysia prior to the 1970s. Or else, a surge in exports results from being a low-cost producer of a particular commodity. There should be an important distinction between having some activities that compete on the basis of static endowments but fail to produce growth (or lose their competitive edge as wages rise), and having a broad competitive base that is capable of remaining competitive as incomes grow (Lall, 2001b). This issue is directly related to our proposed definition of competitiveness.

Finally, using aggregate prices like the real effective exchange rate and unit labor costs is not without difficulties (see Section II). A rise or fall in either measure can be accompanied by both strong and weak economic performance. In other words, there is no unambiguous relation between these price measures and national competitiveness.

#### *National Competitiveness: A More Useful and Practical Concept*

Mainly for these reasons, some economic theoreticians have been intensely critical of the concept of national competitiveness. However, these problems should not lead to the abandonment of the concept. One reason is that the idea behind national competitiveness—or international competitiveness of an economy—is intuitively sound and simple: people care about how well they do compared to others, individually as well as collectively as a nation (Fagerberg, 1996). It is the method of comparison that can be modified to make it more robust.

Another reason for the relevance of this concept is that there is still need for policy formulation at the macroeconomic level that would increase competitiveness at the microeconomic level. While firms would be the ultimate beneficiaries of such policy, proper analysis and design requires intermediate targets. Therefore, the concept of competitiveness must somehow be extended to a more aggregate level without encountering the aforementioned difficulties. This section attempts to delineate a more useful and practical concept of competitiveness.

The gist of the proposed approach is to be more specific in defining the term “national competitiveness” and measures associated with the idea. The first step would be to

distinguish between the concepts of competitive performance and competitive potential (Buckley, et al. 1988). The simplest way to differentiate the two is by the observation that performance is an outcome of potential. Table 1 gives possible measures of both performance and potential at the firm level. The core of the debate is whether these measures can be extended to the national level without encountering uncertainties.

<b>Table 1. Measures of Competitiveness at the Firm Level</b>	
Performance	Potential
Market share (both domestic and export markets); profitability	Price and cost competitiveness; productivity; technology indicators
Source: Buckley, et al. 1988	

As explained earlier, extending the concept of market share and profitability to the national level leads to problems. This is true also for the industry level. Hence, at both the national and industry level, competitiveness should deal solely with *potential* and policies to increase the economy's or industry's competitive potential. The elements of competitiveness potential are: price and cost competitiveness, productivity, and technology indicators. As will be discussed in Section II, the concept of price and cost competitiveness is ambiguous at the national level. What would be left then are productivity and technology indicators, where the latter characterize the technological capability of an economy.

Productivity refers to the efficiency in the use of resources and factors of production. Aggregating productivity across firms—even if it is only labor productivity—raises a number of delicate issues. First and foremost is the aggregation problem, which questions the validity of postulating a production function at the macroeconomic level. The measure of labor productivity, which is total output divided by employment, assumes that this production function exists. Second, it has been acknowledged that the key to raising per capita income over the long-term is productivity growth (Fagerberg, 1988). Hence, by including “productivity” in the analysis, all policies associated with an acceleration of economic growth would be classified as strategies to increase competitiveness. As mentioned earlier, this situation must be avoided.

Unlike market share, profitability, and productivity, the concept of technological capability can be extended from the firm level to the national level without any form of ambiguity. For example, R&D expenditures can be aggregated and the number of scientists and engineers across sectors can be combined. Moreover, macroeconomic policies generally affect technological development in various sectors in the same direction. It should also be noted that increased labor productivity at the firm level is oftentimes brought about by an improvement in technology.

An extensive literature on the linkage between technology, trade performance and economic growth provides a solid framework for analysis.<sup>3</sup> In the older Keynesian

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<sup>3</sup> See Fagerberg (1996) for a brief review of the theoretical and empirical literature.

approach, exports were considered exogenous and growth endogenous, which implied that the causation runs from trade to growth. Subsequently, the exogenous factors were determined to be at a deeper level and these were elements that had an impact on trade performance. Of particular interest were non-price factors, among which technology was recognized as the prime candidate. Two advances in economic theory have brought technological capability—the major element of non-price competitiveness—to the forefront.

The development of the New Trade Theory represented attempts to relax the restrictive assumptions of the neoclassical framework, which assumes the existence of competitive markets, factor substitutability and mobility, and profit maximization. The new theory sought to extend and develop the traditional framework by incorporating in its analysis such issues as the treatment of economies of scale, externalities, technical progress, product differentiation, and monopolistic and oligopolistic situations (Haque, 1995).

A parallel development occurred in the theory of economic growth that likewise stressed the importance of human resource development and technological accumulation: the development of endogenous growth models which make the hypothesis that investment (either in physical capital, human capital, or R&D activities) generates externalities that offset the decreasing returns to inputs. In this context, technological development became endogenous, thus bringing exogenous factors that determine trade performance to another level. The offshoot of the new trade theory and endogenous growth theory was to shift the focus on technology capability as the primary determinant of an economy's competitiveness.

Technological capability will be more relevant if defined at the industry level rather than at a national level. One reason is that historically, an upward movement in the technological ladder has meant a shift from agriculture and other primary producing activities to manufacturing industry. In this framework, sustained competitiveness means the ability of nations to diversify industrial activity from simple to advanced technologies (Lall, 2001).

Differentiating technological capability across the various sectors in manufacturing would also be useful. This would provide a benchmark on the existing technological structure of the economy. In practical terms, technology-intensive structures offer better prospects for future growth because their products tend to grow faster: they tend to be highly income elastic, create new demand, and substitute for older products (Lall, 2000). Thus, studying the technological structure of the manufacturing sector would be indicative of both trade prospects and the potential for sustained economic growth. Another compelling reason for differentiation at the industry level is that selective interventions—if called for—vary across the different sectors of the economy.

To summarize, competitiveness at the national and industry level should be associated directly with technological capability to avoid any form of ambiguity. Various reasons have been cited to justify this definition. When comparing countries, it would be more

useful to conduct the comparison at the industry level. Analysis at the industry level also provides a better technological profile of the economy.

## II. Measuring Competitiveness

At the firm level, measures of competitive performance are straightforward and these have already been enumerated. In terms of competitive potential, there are various measures of technological capability. These include R&D expenditure, employment of qualified scientists and engineers, and number of patents. Some of these are readily extended to the industry and national level.

Meanwhile, productivity is normally couched in terms of labor productivity. As for the concept of total factor productivity, this is a dubious concept even at the firm level. At the aggregate level, total factor productivity is nothing more than a weighted average of the increase in factor rewards. This has absolutely nothing to do with either competitiveness or long-term economic growth.

In this section, various measures associated with national competitiveness will be discussed. This would include the indices reported by World Economic Forum, which are used to rank countries. The last part of the section deals with possible measures focusing on technological capability.

### *Price Competitiveness Measures at the National Level*

The most frequently used indicator of national price competitiveness are various measures of relative prices and/or costs expressed in a common currency widely known as a real effective exchange rate. In its nominal version, the effective exchange rate consists of a weighted average of bilateral rates reflecting their relative importance to the economic issue being analyzed (Turner and Van t' dack, 1993).

One example is the formula used by the Asia Recovery Information Center, thus:

$$REER_j = \sum_i w_{ij} e_{ij} \cdot \frac{CPI_j}{WPI_j}$$

where  $REER_j$  is the real effective exchange rate of home country  $j$ ;  $WPI_i$  is the wholesale price index of partner country  $i$ ;  $CPI_j$  is the consumer price index of home country  $j$ ;  $e_{ij}$  is the exchange rate index between country  $i$  and  $j$  expressed in foreign currency per local currency; and  $w_{ij}$  is share of country  $i$  in the total trade of country  $j$ . The use of CPI and WPI attempts to distinguish, in a rather rough way, between the price of nontradeables and the price of tradeables, respectively.

In this framework, an increase in domestic prices relative to prices of trading partners would lead to an appreciation of the real effective exchange rate—a rise in REER. The same effect would occur if there is an appreciation of the domestic currency, which translates into an increase in  $e_{ij}$ . Theoretically, an appreciation of REER would make



exports more costly causing the country to lose competitiveness ultimately resulting in a fall in its global market share.

Applying the REER to measure competitiveness assumes underlying structural factors are constant and focuses on the kinds of short-term macroeconomic management that affect prices of national goods and services relative to other countries. However, such a measure is not an unambiguous indicator of a country's competitiveness.

One reason for the ambiguity is that international relative price or cost position can be both cause and result of a country's economic performance. For example, the appreciation of the real effective exchange rate can be explained by the Balassa-Samuelson effect and need not necessarily lead to an overvalued currency. Another source of difficulty, which is true for all aggregate measures, is that the latter can be given many distinct statistical forms, using prices, wages, and other costs. There is no one ideal measure and the large number of different measures that are in common use often diverge appreciably (Turner and Van 't dack, 1993).

Empirically, the real effective exchange rate is not a reliable indicator of a country's competitiveness, if the latter is measured by trade movements. Figure A.1 shows the average percentage change of the REER and average trade balance-GDP ratio for selected developing countries. Theoretically, countries should fall in the second and fourth quadrants—an increase or appreciation of REER should be associated with a lower trade balance—but the graph shows no discernible pattern. In a study of the East Asian financial crisis, it was shown that among the five crisis-affected economies, Korea had a very stable real effective exchange rate in the seven year period prior to 1997, but experienced the largest deterioration in its current account balance, while the Philippines had the sharpest appreciation yet experienced only a relatively mild deterioration in its current account balance (Rana and Yap, 2001).

Another important indicator of competitiveness is unit labor cost in manufacturing, since labor represents the most important non-traded input into manufacturing. Labor costs are also the most easily quantifiable, compared say to the cost of capital. Unit labor cost is defined as total compensation,  $C$ , per hour employed,  $H$ , divided by productivity, where the latter is measured as total output ( $O$ ) per hour employed (Hooper and Larin, 1989). In equation form we have:

$$ULC = \frac{(C/H)}{(O/H)}$$

The central problem concerning intercountry comparisons of labor costs is how to translate the costs calculated for individual countries into comparable or common-currency units. The UNIDO publishes industrial statistics from various countries that include total salaries and wages and valued added for the manufacturing sector. However the latter is available only in current prices measured in local currency. Hence to calculate unit labor costs that are comparable countries, the following formula was applied:

$$ULC = \frac{\text{Total\_wages\_and\_salaries}}{\text{Value\_added\_current\_prices}} \times \text{US\_Manufacturing\_price\_index}$$

This formula is valid under the assumption that the exchange rate adjusts over the long-term to reflect purchasing power parity conditions.

A rise in a country's ULC relative to other countries should lead to a decline in its competitiveness, which would translate into a lower global market share. However, empirical evidence has shown that over the long-term market share for exports and relative unit costs or prices tend to move together, the so-called Kaldor paradox. Figure A.2, shows the average growth of ULC in the manufacturing sector plotted against the trade balance-GDP ratio for selected Asian countries. The pattern indicated in the graph tends to support the Kaldor paradox.

One conclusion that can be drawn from this brief analysis is that the standard macroeconomic indicators of price competitiveness do not mimic their counterparts at the firm level. Hence, at the national level, competitiveness is associated more closely with non-price factors, e.g. technological capability.

#### *The World Economic Forum Competitiveness Index*

The popularity of the idea of international competitiveness was further enhanced with the construction of a competitiveness index by the World Economic Forum, which is published in The Global Competitiveness Report (GCR). A similar index is prepared by the Institute for Management Development and published in the World Competitiveness Report. However, because of the similarity of the two indices—they had at one time been a single outfit—and the lack of a detailed methodology from the IMD, only the GCR index is discussed in this section.

The GCR index will be evaluated using three major criteria. One, its underlying framework will be compared with the definition of national competitiveness laid out in Section I. Two, its consistency with economic theory will be analyzed based on the discussion of Lall (2001). Lastly, the empirical soundness of the GCR methodology will be evaluated.

The GCR deals with two distinct but complementary approaches to the analysis of economic competitiveness. The first measure, which is termed the Growth Competitiveness index (GCI), analyzes the extent to which individual national economies have the structures, institutions, and policies in place for economic growth over the medium term (McArthur and Sachs, 2002). Meanwhile, the Current Competitiveness index (CCI) examines the microeconomic foundations of competitiveness, which consist of company operating practices and strategies as well as the quality of inputs, infrastructure, institutions, and array of regulatory and other policies that constitute the business environment in which a nation's firms compete (Porter, 2002).

The authors of the GCR indices agree that the market share view of national competitiveness is deeply flawed. They argue that to understand competitiveness at this level, it is necessary to move beyond the misleading metaphor of direct market competition and relate competitiveness to the sources of a nation's prosperity. At this point the GCR concept deviates sharply from the proposal laid out earlier in Section I.

It is true that the GCR indices are clearly concerned with dynamic comparative advantage and place technological dynamism at the core of building such an advantage (Lall, 2001). However, in practice, the indices are derived from the notion that "true competitiveness rests on productivity... A nation's standard of living is determined by the productivity of its economy, which is measured by the value of goods and services produced per unit of the nation's human, capital, and natural resources"(Porter, 2002).

The reservations laid out against using "productivity" at an aggregate level have already been laid out and will not be repeated here. The actual methodology described in the GCR shows that the indices are too broad in scope to be considered as measures of competitiveness. The GCI is defined as:

$$GCI = 1/2 \text{technology\_index} + 1/4 \text{public\_institutions\_index} + 1/4 \text{macroeconomic\_environment\_index}$$

Immediately, it can be observed that the policy areas included are quite exhaustive and the objective of analysis is more accurately economic growth and not merely competitiveness. This conclusion is supported by the manner in which the elements of the three main indices are obtained, which is by regression analysis using as a dependent variable a composite indicator based on per capita GDP growth.

The CCI is constructed in a similar fashion but focusing on microeconomic factors. The way the analysis is present is almost an exercise in tautology. Higher GDP growth is related to better physical infrastructure, easier access to capital, more highly trained human resources, and more sophisticated consumers. All this is well known; what is still open to debate is the appropriate development path to be taken.

The overall framework of the GCR competitiveness indices is largely based on neoclassical strictures.<sup>4</sup> Despite the emphasis on technological dynamism and reservations about untrammelled globalization, the approach to the technological strategies needed at the microeconomic level is restricted. The oversimplified view of the process of structural change leads to a bias towards the strong neoclassical position and what is termed the market-friendly government role—as opposed to selective intervention. While this is not necessarily incorrect, the discussion in the next section will analyze the shortcomings of this view.

The CCI is largely based on Michael Porter's framework known as the competitiveness diamond. Competitive advantages—as opposed to comparative advantage—arise from

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<sup>4</sup> The discussion in this paragraph and the next is largely based on Lall (2001), pages 1506-1510.

firm-level efforts to develop new products, make improvements, develop better brands or delivery methods and so on: to innovate in a broad sense. Innovation, in turn, is influenced by conditions given by four elements of the “diamond:” factor conditions, demand conditions, related and supporting industries, and the context for firm strategy and rivalry. However, Porter does not provide a theory of competitive advantage in economic terms. The discussion only explains *post hoc*, and in a rather diffuse way, why certain activities have succeeded in certain countries. The link from competitive advantages at the firm level, where the approach is most useful, to the national level remains weak and unsubstantiated.

Empirically, the main problem lies with the regressions, i.e. whether or not the results are spurious. In technical terms, there seems to be no test for stationarity of the residuals. The lack of theoretical robustness also makes the interpretation of causality problematic. For example, “presence of demanding regulatory standards” and “stringency of environmental regulations” have among the highest adjusted coefficients of determination but the theoretical basis for their causal impact on output is so unconvincing that the results appear meaningless or misleading (Lall, 2001). Another problem is that causality can actually run in both directions for several of the variables considered.

There is also concern about aggregating different indices into a single number, which is similar to the criticism raised against the assumption of continuity in utility functions. In standard choice theory, a consumption bundle may lie in the same indifference curve so long as commodity  $x$  can substitute for commodity  $y$ . In the case of competitiveness, a country may have a skewed distribution of the relevant elements for economic growth and may still outrank another country. Singular measures generally fail to capture the nuances involved in defining national competitiveness.<sup>5</sup>

#### *Measures of Competitiveness: A Practical and Useful Approach*

Given the shortcomings of the macroeconomic measures of price competitiveness and the GCR indices, the next step would be to develop measures that would complement the “practical and useful” definition outlined earlier. Fortunately, the inaugural Industrial Development Report of UNIDO (2002) has proposed a framework along this line. This framework is much more concise than the GCR approach and more consistent with the definition of competitiveness explained earlier.

The measures used by UNIDO are divided into two categories. The first set of indicators are combined to gauge the ability of countries to produce and export manufactures competitively. The second set is focused on the “drivers” of industrial performance, or factors that affect the first set. The classification is analogous to the performance/potential distinction made earlier.

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<sup>5</sup> Think about comparing two cars A and B. Car A has a very modern engine but has only three wheels and hence cannot run on the road. On the other hand, Car B has an older type of engine but has complete accessories. If the characteristics of the cars are quantified and the values combined to form an index, it is still conceivable for Car A to outrank Car B even if the former is not functional at all.

Four indicators comprise the first set: manufacturing value added per capita, manufactured exports per capita, and the shares of medium- and high tech products in manufacturing value added and in manufactured exports. Rather than “competitive performance”, these indicators provide more of a technological “profile” of the manufacturing sector. The first two indicators reflect industrial capacity while the last two are a gauge of technological complexity and industrial upgrading (UNIDO, 2002). It can be readily observed that any reference to global market share is not included.

The major drawback in the UNIDO approach is the aggregation of these factors into a composite number called the competitive industrial performance (CIP) index (see footnote 4). Since the economies being analyzed are at various stages of development and have different orientations, it would be more appropriate to examine the individual indicators. A comparison of four selected countries will illustrate the benefits of this suggestion (Table 2).

	CIP Ranking	Manufacturing Value Added per Capita	Manufactured Exports per capita	Share of medium-and – high tech in manufacturing value added	Share of medium-and-high tech in manufactured exports
US	6	7	26	6	5
Singapore	1	4	1	1	3
Philippines	25	60	44	42	2
Thailand	32	44	34	38	25
Source: UNIDO (2002)					

The data for the US and Singapore show why it is inadvisable to focus solely on exports as a basis for measuring competitiveness. The ranking based on manufactured exports and manufacturing value added is quite disparate. The US is ranked seventh in terms of manufacturing value added but only twenty-sixth in terms of manufactured exports. Other indicators give a more accurate description. Meanwhile, the comparison of the Philippines and Thailand (and even between the US and the Philippines) illustrates how one indicator can distort the rankings based on the CIP index. Thailand has clearly outperformed the Philippines in the past two decades, which is evident in the structure and size of the manufacturing sector. However, the quirk in the export structure of the Philippines—where it is ranked second only to Japan in terms of share of medium- and high-tech exports—results in a higher CIP ranking compared to Thailand.<sup>6</sup> This quirk also narrows the gap considerably between the Philippines and the US and Singapore.

<sup>6</sup> This “quirk” will be explained in the box that compares the Philippines and Malaysia.

Detailed analysis of individual variables will also be more useful for design of policy intended to improve competitiveness. An example is provided in Box 1, which makes a comparison between Malaysia and the Philippines. Supplementary measures such as the ratio of value added in a particular sector to total exports of that sector are discussed in this section.

The potential set focuses on five variables directly relevant for industry: skills, technological effort, inward foreign direct investment, royalty and technical payments, and modern infrastructure. These factors are quite similar to those listed by the GCR except for “effective intellectual property laws that promote research and development.” The latter is less relevant for developing countries that are improving their technological capability through a catch-up process.

### **III. Enhancing Competitiveness: Theoretical Considerations**

Granted that technological capability is at the center of competitiveness, the evolution of national competitiveness would likely follow the stages of technological development. An illustrative sequence is provided in the GCR.<sup>7</sup> At low levels of development, economic growth is determined primarily by the mobilization of primary factors of production. As economies move from low- to middle-income status, global competitiveness becomes investment-driven, wherein economic growth is increasingly achieved by harnessing global technologies to local production. Foreign direct investment, joint ventures, and outsourcing arrangements help to integrate the national economy into international production systems, thereby facilitating the improvement of technologies and the inflows of foreign capital and technologies that support economic growth.

In most economies, the evolution from middle-income to high-income status involves the transition from a technology-improving economy to a technology-generating economy, one that innovates in at least some sectors at the global technology frontier. The principal factors that contribute to global competitiveness, and thereby improved living standards, will therefore differ for economies at different levels of development. For example, the main challenge for many middle-income developing economies is to make connections with international production systems by attracting sufficient flows of FDI.

In this context, the key issue becomes the role of government policy to enhance international competitiveness. Would there be role for government to accelerate the progress of an economy through the various stages of technological development? If yes, what would this role be? The debate can be resolved by examining the contending positions and determining which is closest to historical experience. In its simplified form, there are currently two broad approaches to technology in economies: neoclassical—including endogenous growth theory—and evolutionary.<sup>8</sup> Other variants allude to a capacity versus capability debate, and accumulation versus assimilation.

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<sup>7</sup> Lifted from Porter, et al. (2001).

<sup>8</sup> The description of the two schools of thought is lifted from Lall (2001b), Chapter 2.

In a neoclassical world, technology development takes place under highly simplified assumptions: small, homogeneous firms operating in perfectly competitive markets, where all technological options are known (that is, ‘well-behaved’ production functions), choices are made costlessly to optimize allocation on the basis of capital/labor costs, and technology is absorbed and used without further effort or cost. In this world, technical change takes the form of shifts of the function resulting from exogenous ‘innovation’—in traditional models—or from firm’s optimizing R&D choices with predictable outcomes—in endogenous growth models. Firms do not need to learn to use existing technologies, and they operate essentially in isolation, without interlinkages and spillovers. The case for government intervention in this framework is very limited. The assumptions lead logically to the conclusion that free markets optimize resources as long as they are efficient: market failures are possible but of limited significance.

The other approach is more structuralist in nature, and draws upon evolutionary theory of economic growth. In evolutionary theory, firms do not work with full information on technological alternatives, with instantaneous and costless mastery of existing technologies and in isolation from other firms. They operate instead with imperfect, rather hazy and variable, knowledge of the technologies they are using. They need time and effort to learn to use technologies efficiently, and to conduct technological effort. Technical choice, mastery of technologies, minor improvements or adaptations, and more major technological innovations, are part of a continuum of technical effort, undertaken in a relatively risky and unpredictable world of imperfectly understood information and an even more imperfectly foreseen future. Firms cope, not by maximizing a clear and well-defined objective function, but by developing organizational and managerial routines. These routines are adapted over time as new information is collected, experience accumulated and other firms imitated.

As mentioned earlier, the GCR framework adheres more closely to the neoclassical approach. This is implicit in the above discussion wherein progress through the various stages of development seems like a seamless process. However, the existence of market failure prevents the optimal allocation of resources, which results in an uneven growth path. The diverse and widespread nature of market failures in developing countries is well known, especially in industrial technology and development (Lall, 2001).

Lall goes on to argue that in imperfect markets, there are valid issues concerning national competitive ability, which Krugman (1996) accepts fully. However, Lall seems to confuse the issue of defining national competitiveness—which he apparently considers valid only in the presence of market failure—and laying down the case for competitive strategy, i.e. government intervention. Nevertheless, he makes the compelling argument that the main aim of competitiveness strategy in the presence of market failure is to help countries realize or build dynamic comparative advantage.

Two general types of government intervention are identified. Functional interventions are intended to improve markets, in particular factor markets, without favoring particular activities. Provision of basic infrastructure and free education are the primary examples

of the so-called “market friendly” approach. Krugman acknowledges the role and efficacy of functional interventions. The GCR framework also accepts the necessity of this type of intervention.

On the other hand, selective interventions target particular activities and in its extreme form this approach has been identified with the strategy of “picking winners.” Meanwhile, Lall (2001b) has argued for a third category of interventions that lies between selective and functional, which can be termed “horizontal” and refers to policies that promote selected activities across sectors. Horizontal policies address activities for which markets are missing or particularly difficult to create in developing countries, especially in the technology field (e.g. subsidizing R&D). This type of intervention is largely consistent with the evolutionary approach to technological development.

Government intervention can also be justified with regard to influencing export structure, since the latter is not flexible and fully responsive to changing factor prices. From a structuralist viewpoint, export structures are path-dependent and difficult to change. They are the outcome of long, cumulative processes of learning, agglomeration, institution-building and business culture. Moving from low-technology structure to a high-technology one is thus difficult, and may involve a broad and integrated set of policy interventions.<sup>9</sup>

The development of the semiconductor industry in East Asia provides a very interesting and illuminating case study. The creation of new knowledge-intensive, high-technology industries in East Asia, of which the semiconductor is the most prominent, has been described as the real miracle in the region (Matthews and Cho, 2000). Rather than pursue a conventional R&D-led innovation strategy, firms in East Asia appear instead to have perfected a strategy of leveraging advanced technology as the principal resource for participation in high-technology industries. The strategy is based on the creation in these countries of an institutional framework, involving both public and private sectors, that provides a capacity not just to receive the imported technology and knowledge associated with it, but to absorb, adapt, diffuse, or disseminate and ultimately improve it through the efforts of indigenous technologists and engineers.

Based on their experience, five characteristics of high-technology industrialization in East Asia can be outlined:<sup>10</sup>

- New high-technology industries were created not through the spontaneous diffusion of industries or production systems from advanced countries, but as deliberate act of policy designed and implemented by the countries themselves, working within the technological dynamics of the industries concerned.
- The process of high-technology creation in East Asia was achieved through the management of technological diffusion, via imitation, leverage, and learning, rather than through R&D-led knowledge generation by individual firms.

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<sup>9</sup>This argument is made by Lall (2000). This is related to the proposal that the indicators of the CIP are better analyzed individually. Recall that the export structure is one of the four indicators.

<sup>10</sup> This part was lifted from Matthews and Cho (2000), pages 4-21.



- Technological capability was enhanced through resource leverage, by harnessing collaborative networks and competition between sophisticated firms in a developmental, “catch-up” institutional setting.
- The process was affected through industry “nurturing” rather than “protection,” with industry policy evolving as the industries themselves took root and diffused via “governed interdependence” between state agencies and industries.
- The process of high-technology industry creation was iterative, with each cycle leading to the enhancement of technological capabilities and ultimately to industrial sustainability, accomplished within national systems of economic learning. The latter term is preferred over “national system of innovation” since the emphasis is on knowledge diffusion rather than generation.

Policy makers must realize that the context of policy making has changed significantly over the past two decades. The international rules of the game discourage or rule out policies that were implemented by the NICs, some examples of which are selective import protection, local content requirements, export subsidies, and performance and entry rules for foreign investors (Lall, 2001b). However, there are also benefits from the more open and transparent regime, including greater access to OECD markets and international capital and technology flows. The challenge is to design competitiveness policies that would overcome market failures without violating the international rules of the game.

### **Box: A Look at the Electronics Sector of Malaysia and the Philippines**

The study of the World Bank on the East Asia miracle was designed to resolve the debate on the role of industrial policy in economic development. The distinction between functional and selective interventions originated from this study. While it acknowledged the positive contribution of selective policy, the World Bank study cautioned against any attempts to replicate the policies followed by Japan, Korea, Chinese Taipei, and Singapore. In their view, the conditions that underpinned the success of these strategies—referring to the special historical, political and cultural circumstances that enabled competent, meritocratic, and insulated technocracies to succeed—are unlikely to prevail elsewhere.

The report further argued that Indonesia, Malaysia, and Thailand “may show the way for the next generation of developing economies to follow export-push strategies”; unlike the Northeast Asian economies, these three economies followed strategies courting FDI and creating a favorable environment for exporters without at the same time following policies of financial repression and industrial targeting. Thus, the World Bank study claims that the Southeast Asian second-tier NICs have grown rapidly by relying on market forces and minimal, but appropriate and generally supportive, i.e. functional, interventions.

Several studies have disputed this version of the development process of the Southeast Asian NICS (Jomo, et al, 1997; Rasiah, 2002 ). Contrary to the World Bank study, industrial policy played a significant role in the transformation of these economies. An analysis of the electronics sector in two countries will help shed light on this debate.

Malaysia and the Philippines are two countries that benefited from plugging into the global value chain of the electronics sector but with contrasting results. Depending on the data presented and the author cited, one would get different impressions regarding the performance and prospects of these two countries. Data in Table 3 show the distribution of manufactured exports by technological categories. The Philippines has a larger share of high-technology exports, which are mostly electronics. Lall (2000) observed that the Philippine economy has been expanding because of MNCs in the electronics industry, where it has already overtaken Malaysia in semiconductor exports. Its cheap, technically proficient and English-speaking manpower is the major competitive asset.

On the other hand, Lall (2001b) argues that Malaysia has achieved a technologically-sophisticated export structure despite having few of the attributes of a mature industry. These would include a diverse manufacturing base with capital goods manufacturing capabilities, a well-developed local supplier and subcontracting system with large “clusters” of high-technology activities, a well-educated and technically trained workforce, and significant R&D both within and outside enterprises. Lall maintains that Malaysia’s performance is based on high-tech export-oriented FDI that entered more by good luck than by deliberate targeting.

However, Table 4, shows that Malaysia has a more developed domestic manufacturing sector than the Philippines that is obviously more allied to the export sector. Moreover, the value added in the electronics sector as a ratio of total electronics exports has consistently been higher in Malaysia than in the Philippines (Table 5). Since, exchange rate movements after 1997 distorted the trend, the ratio of value added in the electronics sector to GDP is also reported (Table 6). The performance of Malaysia far outstrips that of the Philippines in this aspect.

The enigma of a high-technology export structure in the Philippines remains to be explained. The bulk of these exports are actually re-exports. Hence, the Philippines has been used as a major transshipment point, resulting in low value-added from electronics exports. The concentration of exports in one category can also be problematic in the event the boom in the semiconductor industry fades. Lall (2001b) also contends that it is inappropriate for labor-intensive activities to decline at this stage of Philippine economic development.

Surprisingly, the unit labor costs in the electronics sector in Malaysia have generally been higher than the Philippines between 1990 and 1997 (Table 7). This pattern implies two things. One, there has been considerable effort to upgrade the technological structure of the manufacturing sector in line with the rising unit labor costs. And two, ULC is definitely a weak indicator of competitiveness.

<b>Table 3. Shares of Total Manufactured Exports by Technological Categories 1998</b>				
	Resource Based	Low Tech	Medium Tech	High Tech
Malaysia	16.7	11.0	20.3	52.1
Philippines	7.2	14.5	10.9	67.4

Source: Lall (2000), Table A4.  
 Note: A similar table was published in UNIDO (2002) but the numbers do not add up to 100.

<b>Table 4. Shares of Value Added in Manufactured by Technological Categories 1998</b>				
	Resource Based	Low Tech	Medium Tech	High Tech
Malaysia	34.0	18.4	11.3	36.2
Philippines	50.9	12.9	18.1	18.1

Source of Basic Data: UNIDO Industrial Statistics, 1996 – 2002. ISIC Classification based on the SITC classifications applied by Lall (2000).  
 Notes: Data for Malaysia are for 1997. The UNIDO Industrial Development Report 2002 publishes similar data for 1998 but combines the first two categories and the last two. Data for the Philippines are consistent but not for Malaysia (the ratio in the UNIDO report is 60:40 while the ratio above is 47.5:52.4). One reason may be that Malaysia did not conduct a manufacturing sector survey in 1998. The data reported in Table 4 seem more plausible.

<b>Table 5. Value Added as a Percentage of Total Exports, Electronics Sector</b>									
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Malaysia	24.03	22.47	20.81	19.26	22.51	21.10	NA	17.63	NA
Philippines	17.43	15.61	14.99	13.92	11.72	10.01	6.35	6.48	7.04
Source of Basic Data: PCTAS, various years; National Income Accounts of the Philippines; Monthly Statistical Bulletin (publication of Bank Negara Malaysia), August 2002									
<b>Table 6. Ratio of Value Added in Electronics Sector to GDP</b>									
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Malaysia	6.08	6.62	7.55	7.76	8.59	8.43	NA	10.86	NA
Philippines	0.98	1.09	1.34	1.47	1.55	1.88	1.99	2.23	2.61
Source of Basic Data: National Income Accounts, Philippines; Monthly Statistical Bulletin (publication of Bank Negara Malaysia), August 2002									
<b>Table 7. Ratio of Unit Labor Costs in the Electronics Sector (Malaysia/Philippines)</b>									
1990	1991	1992	1993	1994	1995	1996	1997	1998	
1.29	1.35	1.03	1.11	0.96	1.16	1.33	1.42	NA	
Source of Basic Data: UNIDO Industrial Statistics, 1996 – 2002. Note: Data available only up to 1998. Malaysia did not conduct a survey of the manufacturing sector in 1998.									
<p>The variance in their performances may be partly attributed to the earlier beginnings of the electronics sector in Malaysia, but more detailed analysis would reveal a divergence in technology policy. Industrial policy in Malaysia has generally been perceived as having interethnic redistribution as its overriding objective, resulting in a great deal of inefficiency. The dualism between its import substituting sector—which experienced a revival under the program of heavy industrialization in the early 1980s—and the export oriented sector, is also cited as a product of poorly conceived and managed government intervention. These considerations, which by no means are a consensus view, often overshadow other policy interventions which have been designed and sometimes implemented on a more careful basis, e.g. the Malaysian Industrial Master Plan for 1986-1995 or its 1990 technology development policy (Jomo et al., 1997).</p> <p>The more successful interventions have played an important role in shaping the overall trajectory of the semiconductor industry in Malaysia, and in building up the capabilities needed to develop an indigenous industry. In the earlier years a Singapore-style development agency was established, the Penang Development Corporation, which was at the center of efforts to leverage skills and business from multinational corporations. More recently, Malaysia has made a breakthrough in the electronics sector with the start of front-end wafer fabrication. Critical to this development has been the creation of advanced infrastructure and R&amp;D support in the form of the Kulim High-technology Park in Kedah, and the Malaysian Institute of Microelectronic Systems (Matthews and Cho, 2000).</p>									

There is a way to summarize Malaysia's experience and reconcile it with the earlier critique by Lall. Among Indonesia, Thailand and Malaysia, only the latter attempted to build the institutions necessary to stimulate structural upgrading in firms—particularly in the 1990s— much of which, however, have been eclectically implemented. These eclectic strategies have reduced Malaysia's potential for long-term solutions (Rasiah, 2002).

Protectionism and government intervention have been cited as the factors behind the stagnation of the Philippine economy. More outward oriented policies were implemented beginning in the early 1970s and the orthodox economic program was accelerated in the 1990s. Ironically, the relatively low-value added in the electronics sector is primarily attributed to lack of political will to implement a comprehensive policy to promote information technology as an industry (Austria, 2000). Other factors of course include infrastructure and institutional bottlenecks and the lack of specialized skills for high value-added IT products, which generally require both functional and selective government interventions. Nevertheless, the religious adherence of economic managers in the Philippines to orthodox economic programs may have resulted in more passive policies with regard to multinational corporations.\* Industrial policy that targeted activities for entry by local firms or functions for upgrading was never seriously considered.

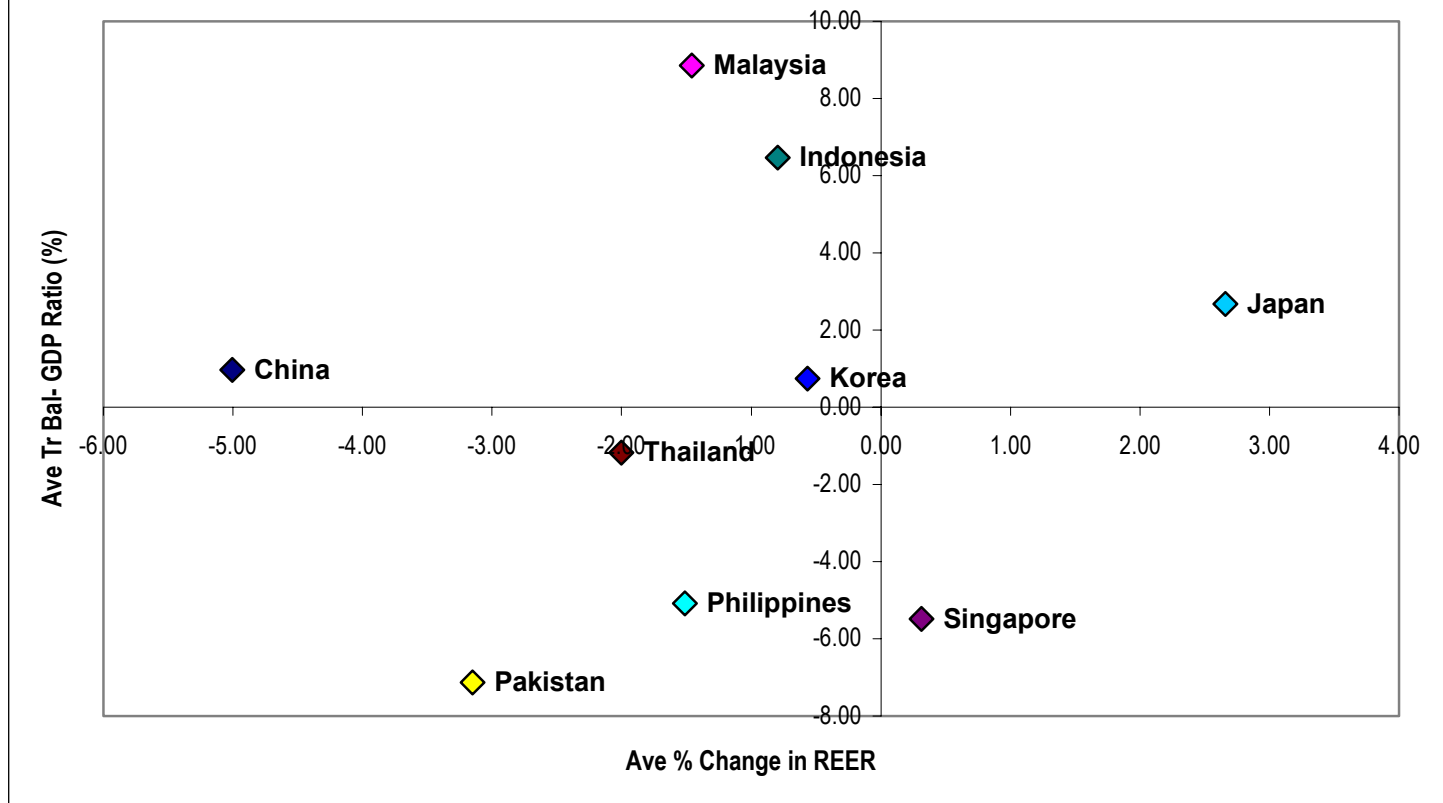
\*One can distinguish between a passive FDI-dependent strategy and a strategic FDI-dependent one. The latter is characterized by strong efforts to upgrade MNC activity, directing investments into higher value-added activities, and inducing existing affiliates to upgrade their technologies and functions. On the other hand, the passive strategy relies on market forces to upgrade the structure. The main tools are a welcoming FDI regime, strong incentives for exports, with good export infrastructure, and cheap, trainable labor.

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Figure A.1. Average Trade Balance-GDP Ratio Against Average % Change in REER



Source of Basic Data: IMF-IFS, ARIC website

Source of Basic Data: UNIDO Industrial Statistics, 1996 – 2002.

Figure A.2. Trade Balance to GDP Ratio and Growth Rate of Unit Labor Cost

