

Chapter 7

Relevance and Consistency of the Competitiveness Indicators

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Abstract

This paper reconsiders meaning and theoretical foundations of the competitiveness measures. Firstly, we can identify two approaches for measurement of the competitiveness, namely, multi dimensional approach and national competitiveness approach. Secondly, there are three important factors which determine competitiveness. They are resources, outcomes, and process which transform the resources into outcomes. Taking these into consideration, the paper reviews, in the second section, the competitiveness measures based on export shares (Constant Market Share, Revealed Comparative Advantage, and technological content of the exports). In the third section, we review indicator approaches which focus of factor cost, productivity, and technology. Final section, we draw some issues for refinement of the competitiveness measures. In that section, we identify issues regarding the theoretical specification of the process linking resources and competitiveness outcomes, the process linking FDI (or economic integration) and a national technological potential.

Keywords: Competitiveness Indicators, Resources, Outcomes, Transforming Process

1. Introduction

In recent years, a lot of organization and researchers construct competitiveness indicators. However, the relevance, consistency and theoretical foundations of the competitiveness indicators are still under debates, and this paper attempts to reconsider the relevance of the present competitiveness indicators. In the first section, we review issues regarding concepts of competitiveness and why international competitiveness can be a policy target (Vickers 1995). In the second section, we review existing method for analysis of competitiveness, such as the Constant market share Analysis (CMS), Revealed Comparative Advantage (RCA), and other indicators relating to the productivity and technology. Finally, we review methodology how to use indicators to promote competitiveness thorough economic integration and to realize the benefits from economic integration.

2. Theoretical Issues

2.1. Two approaches for measurement of competitiveness

Some countries and cities, or regions manifestly perform better than other in terms of export and productivity. The differences in the performances are shaped by an interplay between the attribute of cities and regions as locations and the strength and weakness of the firms and other economic agents active in them (Begg 1999). According to UNCTAD(2002:xx), while export competitiveness starts with increasing international shares, it goes far beyond that. It involves diversifying the export baskets, sustaining higher rate of export growth over time, upgrading the technological and skill content of export activity, and expanding the base of domestic firms to compete internationally so that competitiveness becomes sustainable and is accompanied by rising incomes. An increase in competitiveness in one country needs not come at the expense of another. On the contrary, gains in productivity and efficiency in different countries can and must be integrated and mutually reinforcing. The same could be said of cities or of regions within and between countries.

In search of definition of competitiveness, there are two approaches. The first is a multi dimensional approach, which is explained by Begg (1999) The second is the national competitiveness approach, which is explained by Lall (2001). In the first approach, according to Begg(1999), there many possible sources of competitive advantage which determine national or regional relative economic performance. Competitiveness is firstly reasonably understood and accepted as a meaningful concept at the level of the firm. The indirect costs, which are external to the firm, represent a second level of analysis relating to cities or regions. A third level of analysis is governance and policy environment. Urban system and regional structure as a whole can also influence national competitiveness. This fact suggests that it is important to use

multi dimensional indicators in analysis of the competitiveness.

In the second approach, according to Lall(2001), a sound competitiveness index must confine itself to activities involving competition between nations; otherwise, it becomes a broader and very different exercise dealing with productivity or growth in general. In addition to this, it must identify market failures that affect competitive ability, particularly the evolution of dynamic comparative advantage. In the framework of Lall(2001), the link between competitive advantage at the firm level to those at the national level is very important. This is because competitive analysis, which is useful for national policy intervention, has to explore market failures to create multiple equilibrium and low growth traps (Note 1).

These two approaches seem to be complementary to each other. As for the first, in order to summarize indicators relating to the various level of analysis, a theoretical framework is needed. As for the second, even if the main indicators must focus on the national competitiveness, in order to examine empirically the link between the competitive advantages to those at the national level, indicators relating to the intermediate levels are needed.

2.2. Factors affecting the competitiveness

There are three important factors which determine competitiveness. They are resources, outcomes, and process which transform the resources into outcomes (resource utilization, Begg 1999). The process can be decomposed into capability and the environment. The capability refers to the ability of firms and individuals to utilize the resources and to develop a new technology, and the environment refers to factors affecting the performances of the firms and individuals, and it includes infrastructure, institutions, and policy environment. As for the unit of competitiveness analysis, researchers argue that competitiveness is determined by not only factor endowments or resource, nor industrial policy of the states, but also the interaction between the firms, or interaction between the firms and the governments. If the industrial cluster and network of the firms are important factor for determination of the competitiveness, unit of definition of the competitiveness includes not only nations, but also region firms and cities. The organization of productive assets in a firm gives rise to the analysis of the firm as the unit of production. It is fair to say firms are competitive, but nations, regions, or cities too can be seen as competitive, so that it is reasonable to think in terms of the competitiveness of that bundle of assets. This is because the fact that cities and the regions can provide non financial environment for formation of industrial network (Tasaka(2005,pp.2-5)).

These considerations can be summarized in table 1. If we see the literature relating

to competitiveness, we can find competitiveness measures rely on (1) export share

changes of goods and countries (CMS) and (RCA), (2) indicators relating to technology and productivity, (3) indicators relating to policy and institutional environment (World Bank's Investment Climate Indicators (World Bank(2004)) (Note 2).. The competitiveness analysis based on competitiveness indicators focuses on (1) identification of factors affecting export share changes, and (2) identification of benefits from changes in export composition. Most competitiveness analysis focuses on identification of factors affecting the export composition, and analysis regarding the benefits from export competitiveness is relatively few

3. Competitiveness analysis based on export shares

3.1. Constant Market Share (CMS) model

The constant market share (CMS) model accounts explicitly for the impact of world demand, product composition, differences in demand in each country and competitiveness vis-à-vis exports from a particular country. The model breaks down the differences between the increase in value of a country's exports over a given period and the increase that would be required in order for that the country to maintain its share of world exports (i.e., the world demand for exports effects) into three basic effects(Chami Batista and de Azeredo(2002,p. 162)).

$$\sum_i (X_i^t - X_i^{t-1}) - r \left(\sum_i X_i^{t-1} \right) = \sum_i (r_i - r) X_i^{t-1} + \sum_i \sum_j (r_{ij} - r_i) X_{ij}^{t-1} + \sum_i \sum_j (X_{ij}^t - X_{ij}^{t-1} - r_{ij} X_{ij}^{t-1})$$

In this framework, difference between the export variation and the world demand for export effect is decomposed into the commodity effect, market effect, and competitiveness effect. The positive differences means that the country has increased its share in world exports, while a negative differences indicates a reduction in that share. The first effect-identified as the commodity effect, i.e., the composition of exported merchandise- calculates to what extent market share gains (losses) can be attributed to the concentration of exports in goods for which world demand is growing more rapidly (or slowly) in relative terms. The second effect-identified as the market effect- calculates to what extent market share (or losses) can be ascribed to the concentration of exports in markets (countries or destinations). where demand is growing relatively more rapidly (or more slowly). The third effect-identified as the competitiveness effect-is calculated as the residuals and estimates to what extent factors other than the commodity and market effects can explain market share gains or losses. The competitiveness effect reflect not only relative prices but also such other aspects of demand as (i) differential rates of improvement in product quality; (ii) differences in the efficiency of export marketing and financing; and (iii) differences in the ability to meet demand rapidly. On the supply side, the single most important factor is the productivity differential between domestic and foreign producers in each sectors.

3.2. Revealed Comparative Advantage (RCA)

Analysis have assumed that the post-trade measure such as trade, production, and consumption can be used to construct an index of ‘revealed comparative advantage’(RCA) which will approximates the true pattern of comparative advantage. Three approaches can be identified. First, some analysts have chosen to make use of both production and trade statistics in constructing their estimates. A second method of measurement depends solely on trade statistics, while the third approach is based on deviation between actual and expected values of production and consumption. Among the ‘trade-only’ measures of RCA, several version can be identified(Balance(1988)).

$$Balassa(BAL) = \frac{X_{ij} / X_{im}}{X_{wj} / X_{wm}}$$

$$Net - eportratio = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}$$

$$Donges - Riedel - measure = \left(\frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}} \right) / \left(\frac{X_{im} - M_{im}}{X_{im} + M_{im}} - 1 \right) \times sign(X_{im} - M_{im})$$

$$Normalized - net - export - ratio = \frac{X_{ij} - M_{ij}}{T_{im} (T_{wj} / T_{wm})}$$

X: exports, M :Imports i=country, j=commodity, M=total manufacturing, W=world, T=(X+M)/2

Edwards and Schoer (2002, pp. 1022-1023) argue that, because the RCA competitiveness measures uses post trade data to reveal a country’s comparative advantage, it is subject to the same criticism as the shift-share analysis of trade flows. For example, the measure does not take the impact of domestic trade policy instruments on the trade structure into accounts. Thus, without careful analysis of other economic factors, the indicator itself cannot reveal whether trade has occurred because of comparative advantage forces or because of domestic distortions. The composition of import is highly influenced by the domestic tariff or quota structure, and export structure is less influenced by country specific policies because export faces a world market. Various approaches can be used to provide some theoretical guidance for the interpretation of RCA indicators. For example, RCA indicators of exports to a common region can be compared across countries with similar factor endowment. This approach implicitly draws upon the Heckscher-Ohlin model, and allows the researcher to interpret

differences as being due to trade policy distortions or the failure to exploit market opportunities.

Edwards and Schore (2002) construct a dynamic RCA indicator by decomposing the growth its constituent parts. The RCA of commodity j is defined as:

$$RCA_j = \frac{\frac{X_{ij}}{\sum_j X_{ij}}}{\frac{X_{wj}}{\sum_j X_{wj}}}$$

In this equation, the share of commodity j in country i's exports is compared with the world share of commodity j in total world exports. By taking logs of the RCA and then totally differentiating, growth in RCA can be decomposed into the growth in the share of commodity j in country i trade, and the growth in the share of commodity j in world trade. Edwards and Schore (2002) admit that scope of the dynamic decomposition of RCA in predicting long term competitiveness appears limited, and the volatility of growth in RCA values inhibits sector specific policy formation on the basis of these indicators.

3.3. Technological contents of the exports

Lall and Albaladejo(2004) focuses on changes and diversification of export composition. Lall and Albaladejo(2004) argue that, with oligopolistic markets, externalities, product differentiation, costly and uncertain learning processes, scale and agglomeration economies, technological lags and so on, competitive advantages can be created by national strategies to exploit static advantages and create new advantages, and they can be preserved by appropriate policies given threat from new competitors with lower wages and other advantages. Lall and Albaladejo(2004) rely on relative market shares as a measure of competitiveness and disaggregate exports according to technological categories to gain a deeper understanding of the changes, grouping products into four main categories: resource based, low technology, medium technology, and high technology based on export data at the three digit level, SITC Rev.2.

1. Resource based products include processed foods, tobacco and wood products, refined petroleum products, dyes, leather, precious stones and organic chemicals. They may be simple and labor intensive (e.g., simple processed leather) or capital, scale and skill intensive (e.g., petroleum refining). Competitive advantages here generally (but not always) arise from the availability of natural resources.

2. Low technology products include textile, garments, footwear, simple plastics, furnitures and glass wear. These products have stable, well diffused technologies largely embodied in capital equipment, with low R&D expenditures and skill requirements, and

low economies of scale. Labor costs tend to be a major element of cost and products to be undifferentiated, at least in the mass produced (non fashion) end of the scale. There is an important high end in low technology products where design, brand and quality matter more than price : high wages are not a competitive disadvantage here.

3. Medium technology products are heavy industrial goods such as automobiles, industrial chemicals, machinery and standard electorical and electronic products. They have complex but not fast changing technologies, with moderate R&D expenditure but advanced engineering and design and large scales of production. Barriers to entry tend to be high, not only because of large capital equipment, but also because of strong learning effects in operation, design, and in certain products, product differentiation.

4. High technology products include complex electronics and electorical products, aerospace, precision instruments, fine chemical and pharmaceuticals. The most innovative ones call for large R&D investments, advanced technology infrastructures and close interaction between firms, universities, and research institutions. But, many high technology activities, particularly electronics, have simple assembly processes where low wages are an important competitive factor. The high value to weight ratio of these products allows discrete processes to be segmented and located across long distances. (Lall and Albaladejo(2004,pp.1458-1459))..

As for the classification of Lall and Albaladejo(2004,pp.1458-1459), it seems to be identify the ranking of the technological level, because the path of technological development can be complex and discrete. For example, it is difficult to evaluate the extent of technological upgrading when some of production and simple assembly processes are introduced into the underdeveloped regions.

4. Indicator approach

4.1. Benchmark Model

There studies based on competitiveness indicators without any theoretical model supporting the indicators. For example, Lall (2001) critically examine Porter's competitive advantage model, which forms the explicit base for Current Competitiveness Index (CCI) of World Economic Forum (WEF). The concept of the competitive advantage originates in corporate strategy analysis rather than economic analysis. The competitive advantages do not arise from the interaction of industry specific factor intensities with country endowment of those factors. They arise instead from firm level efforts to innovate in the broader sense, namely, to develop new products, make improvements, develop better brand or delivery methods, and so on. Innovation can arise in any industry regardless of factor intensity, wherever conditions are conducive to innovative effort. The competitive potential of each economy is given by the interaction of its innovative conditions and strategic patterns (Lall(2001,pp.1510)). Although acknowledging importance of the competitive advantage model, Lall(2001)

argues that it does not yield a theory of competitive advantage in economic terms (i.e., yielding testable predictions on which activities succeeded in which locations). According to Lall(2001), it only explains in a rather diffuse way, why certain activities have succeeded in certain countries. The link from competitive advantage at the firm level to those at the national level remains weak. For example, while particular advantages may indeed arise in any activity, some activities have inherently higher propensities to create and sustain innovative advantages. Factor endowments are important in enhancing technological intensive activities. If the concept refers to the nature of local demand as a factor of sophistication and discrimination, it would have to be shown that sophistication of local demand affected different activities differently and that sophistication was causally related to the move to more advanced capabilities (Lall(2001,pp.1510-1511)).

If competitiveness analysis is valid, there is a useful role for competitiveness indices to benchmark national performance. If, this reasoning is valid, a sound competitiveness index must be defined in terms of production or cost function. This is because the analysis have to identify the factors affecting the efficiency of process transforming the resources into economic performance (Note 3). For example, export goods production is produced by capital (K) and labor (L) with constant return to scale production function (F(K,L)) and technology parameter A.

$$Y = AF(K, L) = Af\left(\frac{K}{L}\right)L = Af(k)L$$

$$MPL = \frac{\partial Y}{\partial L} = A(f(k) - kf'(k))$$

Labor cost is determined as follows.

$$w = (1 + s)MPL$$

Price is determined as follows.

$$p = (1 + m)w = (1 + m)(1 + s)MPL$$

Price competitiveness is determined by relative price of the export product (p/ep^* , where p^* is prices of products of foreign countries e is exchange rate). Thus, export competition is influenced by (1) exchange rate (e), (1) degree of product imperfection (expressed as mark up rate (m and m^*)), (3) degree of imperfections in factor markets (expressed as difference between wage (w) and marginal productivity of labor (MPL), namely s and s^*), (4) technology level (A and A^*), and (5) difference in capital labor ratio (k and k^*). Policy and institutional environment affect factors relating to (2), (3), (4) and (5).

4.2. Regional Indicators

Deas and Giordano(2001) propose a conceptual model which distinguishes between sources of competitiveness(the initial stock of assets present in a geographical unit), on one hand, and outcomes of competitiveness (the results of attempt by firms to exploit these assets).on the other. They have sought to identify the asset bases of a sample of cities and conurbations, and to consider the effectiveness with which base are translated into competitive outcomes by firms. At the same time, in attempting to assess the relationships between assets and outcomes, they have also attempted to consider the intervening impact of management process. By referring to the concepts, they convey the ability of firms to exploit resources at their disposal, and the efforts of local policy actors to create, operate, supplement and replenish city asset bases, and to transform liabilities into assets. First, variations in economic environment within which firms operate were gauged in a number of ways (for example, the skill base indicators which cover school pupil performance, participation in full time education amongst school leavers, and job related training, indicators covering managerial and professional grades as well as craft related employment. Second, the characteristics of the political and institutional environment were embodied through indicators selected to measure the cohesion and effectiveness of local institutional structures, as reflected through the ability of local policy makers to draw upon sources of discretionary grant funding. Third, disparities in the assets which constitute a city's physical environment were explored through a range of indicators. Fourth, they attempted to explore the influence of variations in the social environment upon firm competitiveness though a number of measures of assets and liabilities.

As for the outcomes, Deas and Girdano(2001) include not only competitiveness in narrower sense, but also indicators regarding general economic well being. Six measures of outcomes were selected. The first three were intended, as far as possible, to measure the aggregate health of individual firms within which the set of cities. The second set of outcome measures aims to provide an indication of broader economic well being in the respective cities.

4.3. Unit labor cost

Keyder et al. (2004,pp.47-49) discusses the importance of unit labor costs in international trade as an international competitiveness indicators and points out its advantage and disadvantages. Labor productivity and nominal wages are the two factors that affect unit labor cost. Productivity is defined as the gross product or value added per person employed or when data on working hour is available, per hour worked. Labor cost per unit of output (unit labor cost) is defined as nominal labor compensation divided by real value added. Total labor compensation includes wage compensation and other labor cost

such as employer's contribution to social security and pension schemes and labor cost of self employed.

According to Keyder et al. (2004,p.47), the unit labor cost indicators take into accounts productivity differences in comparing labor costs. An increase implies that labor costs rise by more than productivity gains such that the competitive position of the region deteriorates. Hence, unit labor cost reflects the competitive advantage and disadvantage due to lower or higher labor cost. International price and costs competitiveness is an important determinant of trade flows and foreign direct investment flows. Costs of tradable inputs such as raw materials and capital are likely to be approximately equalized internationally. The most important non-tradable input is labor. Thus unit labor cost could be a useful indicator of cost competitiveness.

For example, total labor costs assumed to be composed of marginal productivity of labor and fixed costs which does not directly relate to production volume, including training and recruitment. If we assume that production function is Cobb-Douglas, MPL can be expressed as follows:

$$MPL = aA\left(\frac{K}{L}\right)^a = aPR$$

$$w = MPL + T$$

Unit labor cost (ULC) can be expressed as follows:

$$ULC = (W / PR) = \frac{MPL + T}{PR} = \frac{MPL + T}{MPL/a} = a + \frac{aT}{MPL}$$

Thus, ULC is influenced by (1) technology (A), (2) fixed labor cost (T), (3) capital labor ratio, (4) production parameter (a, which relates to distributional share of labor and capital). The fixed labor cost (T) can be influenced by policy and institutional environment. For example, when there is an agglomeration of skilled workers in a region, the fixed cost regarding to training and recruitment can be reduced. Transportation and social infrastructure which affect cost of living may be other factors affecting the fixed component of labor cost. Indicators relating to regional characteristics can be interpreted as factors relating to the fixed components in labor cost.

5.The Role of FDI and Economic Integration

In recent years, competitiveness can be enhanced thorough not only policy intervention, but also by involvement of FDI. It is very important issues how to link the inflow of FDI and bases of competitiveness in economy or a region. According to UNCTAD(2002,xxi), development impacts from improved export competitiveness cannot be taken for granted. TNC and economic integration thorough transaction of intermediate products can help raise competitiveness in developing countries, but it needs to be seen as a means to an

end-namely, development.(UNCTAD(2002,xxi)).

As we review in the first section, there two approaches to promotion of competitiveness. The first one is capability approach to enhance ability of the firms, industry and the human resources. The other one is the environment approach which focuses on institutional and policy environment.

As for the environment approach, World Bank(2004:pp. 244-251) explains indicators regarding the indicators regarding the environment for investment. For example, World Bank's Investment Climate survey of Forms indicators include (1) policy uncertainty constraint, (2) corruption constraint, (3) courts constraint, (4) crime constraint, (5) tax rate constraint, (6) financial constraint, (7) Electricity constraint and (8) skills constraint. World Bank's Doing Business Project include (1) days to start up a business, (2) days to enforce a contract, (3) the time and number of procedures to register property, and (4) resolving insolvency. The ranking of the World Economic Forum's Global Competitiveness Report is based on (1) transparency of government policy making, (2) intensity of local competition, and (3) regional disparities in quality of business environment.

The policy towards FDI and economic integration sometimes relates to realize the potential of the national and regional economies(Note3) In the literature relating to the competitiveness indicators, there seem to be three aspects of the concept of the realization of potential. They are (1) productivity, (2) resource utilization and reduction of idleness, and (3) innovation for new products and markets. Productivity relates to the competitiveness originating from cost and price reduction. Resource utilization aspect has two meaning. On the one hand, existence of idle resources indicates low capability and constraint which hinder exploitation of potential of the economy, but, on the other hand, existence of idle resources itself indicates existence of potential for improvement and growth. Competitiveness in these three aspects can be gauged in terms of resource, capability, and environment, and we must not only measure competitiveness per se but also the benefits and by products of changes in competitiveness. As for the realization of the potential, UNCTAD[20902:227] explores method for assessing the potential for export oriented FDI. The starting point is to classify a country's largest export products into four groups, based on their trade dynamics : Champion (Products in which the country is gaining market shares in world trade and its export growth is above average), achievers in adversity (products in which the country is gaining market share in world trade, but its export growth is below average), underachievers (products in which the country is losing market shares and export growth is above average), and losers. This approach assumes that additional FDI could be attained into product or industries that are already internationally competitive. It is also the first step toward identifying further export potential.

6. Concluding Remarks

There remain several issues regarding the measurement of the competitiveness, two issues need to be clarified. The first is the identification of process linking the national, regional and the firms' competitiveness. The most efficient units of economic competition is often larger or smaller than that of established legal or regional framework. Economic integration leads to territorial competition, and impact of economic integration may be uneven. In order to make the gains from integration to spread from core to the near periphery, policy would be very important and this needs the analysis regarding the process linking the national, regional and the firms' competitiveness.

The second relates to the technological upgrading. Technological capability development is included in the benefits of economic integration, but trajectory of technological development can be complex, discrete, and uncertain.

Finally, competition can be seen in terms of not only prices, but also in terms of quality, transaction cost regarding intermediate products, and so on. As explained by Vickers(1995), it is necessary to study what types of competition lead to improvement in overall performance of developing countries.

Notes

1. According to Lall (2001), most analysts use a broader definition of competitiveness than mere price competitiveness and focus on structural and institutional factors affecting medium to long term performance : productivity, innovation, skills and son on. The analysis of structural competitiveness repudiates the basic theory of comparative advantage. When economies trade with each other they do not (as firms do compete in a confrontational manner. They engage in a non zero sum game that benefits all parties: countries specializing according to their factor endowments do better than in the absence of trade. In this setting, there is no way to define "national competitiveness". This does not, however, dispose completely of "competitiveness"as an economic issue. When market failures exist, free market cannot allocate resources optimally, and countries can improve their position by intervening to remedy (or exploit) market failures. Market failures may interact to create multiple equilibria and poor countries caught in low growth traps unless they mount coordinated strategies to sift from low skill, low technology activities to higher value activities.
2. According to Begg(1999), at the aggregate level, and with full employment of resources, competitiveness and productivity are the same thing according to some economists. Other economists has emphasized the quality of investment and use of technology, while others equate competitiveness simply with real exchange rate, which implies either the use of competitive devaluation or wage cutting.

Analytically, the quest for competitive advantage by lowering labor costs is very similar to devaluation as it amounts to a transfer of welfare from the workers employed in production to consumers, some of whom will be in other countries, or profits.

3. As for the realization of the potential, Deas and Giordano [2002] argue that the distinction between assets and outcomes represents a potentially useful way of conceptualizing and measuring the extent to which a city or region can utilize its assets through increasing urban competitiveness. A conventional analysis of 'competitiveness', drawing on indicators in single indicators (such as export share) not have said anything about the extent to which levels of competitiveness with different cities reflect the differential strength of their respective assets bases. The assets-outcomes measures also shed further light on accounts of the economic fortunes of particularities within the sample. For example, the residual from the regression equation provide a potentially useful base on which to conduct complementary qualitative exploration of the factors that make some cities more or less competitive than their assets bases might suggest (Deas and Giordano (2002,pp.1426-1427)). Deas and Giordano [2002] argue that the assets-outcome model could also usefully inform further quantitative assessment: for example, by exploring lag times between asset and outcome measures and investigating the degree to which the former predate the latter, or by exploring time-series trajectories across the sample of cities as a means of assessing the relationship between competitive outcomes and policy maker driven attempts to develop urban asset bases over time. (Deas and Giordano (2002,pp.1426-1427)).

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Table 1. Classification of Competitiveness Indicators

Unit/factor	Resource	Process	Outcomes
Firms/industry	Supporting industry	Capability of organization of the Firms	Productivity Technology
Regional/cities	Infrastructures Skilled workers		Economic well being of the region
National		Institutional Environment Enforcement of the contract Transparency of policy making Economic stability Inflow of FDI	Export shares Upgrading of products

Source: Compiled by the author.

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