

## **COMPETITIVENESS OF INDUSTRIAL FIRMS**

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### **Abstract**

*In the theory of resource based theory, the competitive advantage can be achieved by lower costs, as well as by a higher efficiency of the company and product differentiation. The lack of innovations in SMEs is connected with the lack of a formed vision, weak management structure, weak growth strategy, lack of resources and increasing exposure to global factors and competition. This paper, in this respect, supports the potential positive impact of the experience and knowledge in the field of information technologies on the IT competences of employees and management. The paper presents the reviews of empirical research on investing in innovations and new technologies. The main estimate of the paper is that investing in innovations and new technologies is in some forms more significant, while it is still insufficient in relation to the pace of introduction of new technologies and the needs of the global market.*

*Keywords: Competitiveness, strategy, business, measurement, innovation*

### **INTRODUCTION**

Competitiveness, in recent times has grown in importance as an indicator of the performance or the potential of an economy in the context of international economic relations. Countries have become obsessed with defining and measuring competitiveness since its clear as a determining factor of long-term growth and prosperity. This has contributed to the proliferation of a diverse literature on defining and measuring competitiveness. Several definitions of competitiveness have been proffered with no general agreement on any given one. Moreover, competitiveness can be measured at the national, industry or firm level. While, the concept may be simple to define and measure at the firm level, it is most exigent at the national level, due to its multifaceted nature.

## THEORETICAL UNDERPINNINGS, DEFINITIONAL AND MEASUREMENT ISSUES

The concept of competitiveness in the past two to three centuries has been rooted in the traditional trade theories surrounding comparative advantage, which state that if the relative opportunity costs of producing goods differed among countries, then potential gains existed from specialization and trade. Comparative advantage has been attacked on many grounds but particularly on the assumptions underlying the standard theory, which have been found to be unrealistic such as perfect competition with efficient markets, homogeneous products, universal access to technology with no learning costs, no externalities or scale economies, technically efficient firms and full employment of resources (Asian Development Outlook, 2003). The theory has also been criticized for being static and detractors suggested that competitiveness theory in the 21st century required an approach that encompassed dynamism, upgrading and innovation.

Thus, the new trade theories have shifted emphasis away from comparative advantage to competitive advantage. The more recent or new trade theories differ from the traditional comparative advantage theory by assuming differentiated products, imperfect competition and increasing returns to scale. Competitive advantage, the new buzzword at the end of the twentieth century was coined by Porter, who suggested that competitive advantage was created and sustained by firms' ability to innovate and improve the quality of their products and the production processes through technological advancement.

### Classification of Theories

The diversity of theories on competitiveness has resulted in a plethora of definitions and a wealth of indicators for measuring competitiveness. Wignaraja has attempted to classify the theories into three distinct groups. The first is from a macroeconomic perspective, the second from a business strategy point of view and the third from a technology and innovation approach (Ganeshan Wignaraja, 2003).

### Macroeconomic Perspective

This school of thought is based on macroeconomic theory and policy which suggests that the exchange rate is a key factor in the determination of a country's ability to create the macroeconomic conditions suitable for achieving international competitiveness. It defines international competitiveness "*as the level of the real exchange rate which in combination with the requisite domestic economic policies achieve internal and external balance*". An appreciation of the real exchange rate is associated with a loss in a country's international competitiveness, while a depreciation of the real exchange rate implies an improvement.

The measures connected with this definition are the relative price of nontradeables to tradeables, real effective exchange rates, relative consumer prices, relative wholesale prices and relative unit labour costs in the manufacturing sector. The most popular and widely used of these measures is the real effective exchange rate given the easy availability of the data. The macroeconomic perspective has been criticized for the use of only relative prices or unit costs indicators in its measurement of competitiveness since non-price factors such as technological capabilities and the ability of firms to compete on delivery are not taken into account. Secondly, there is little scope for government policy since it depends mainly on the exchange rate to correct balance of payments disequilibria and to restore profitability of the tradeables relative to the non-tradeables and the loss in competitiveness. However, it does not address those factors that hinder firms' ability to be successful in developing countries such as poor infrastructure and a lack of scientific and engineering skills.

Nevertheless, the measures falling under this perspective are widely used in examining competitiveness issues in developing and developed countries. In the Caribbean much work has been done in constructing and analyzing competitiveness measures (REERs, RULCs). For instance, in Trinidad and Tobago work has been done by Phillip Colthrust and Janice Nicholls in developing the REER, while competitiveness studies have been undertaken in Jamaica (Chandar Henry), the ECCB (Dr. Wendell Samuel and Allister Mounsey) and Caricom (Dr. Karl Bennett).

### **Competitiveness as capacity to create welfare**

Competitiveness is a concept that has shifted from the analysis of firms to that of locations and countries. Many specialists argue that *standards of living* are a meaningful measure of competitiveness at macroeconomic level. The definition proposed by European Competitiveness Reports (European Commission) is the key element for this interpretation of competitiveness. In EC view *competitiveness is understood to mean high and rising standards of living of a nation or a group of nations with the lowest possible level of involuntary unemployment, on a sustainable basis*. Standard of living can be decomposed into employment and labor productivity performances. In the long run, improvements in employment performance are bound by the natural rate of employment, leaving the burden of ever increasing living standards to the productivity. The interest on competitiveness increases particularly strongly in countries and regions that are performing relative poorly compared to other geographical zones. This suggests a close link between the meaning of competitiveness and the ability of an economy to create wealth for its citizens compared to other economies. The traditional approach to measure this is to look at changes in GDP per capita relative to those in other

economies. The past years developments in the field of competitiveness has moved to this comparative approach towards the idea that through productivity growth and international trade all countries can simultaneously improve their GDP per capita and their competitiveness.

The interpretation of competitiveness as ability to create welfare has to include an “outcome assessment” and a “process assessment”. The definition of outcome competitiveness as the welfare of nation correlates with per capita income, employment, distributional, social and ecological goals. The definition of process competitiveness refers to processes and capabilities generating competitiveness. Some of the authors consider processes and capabilities to generate competitiveness as “drivers of competitiveness” and includes strategies that foster competitiveness and indicators of the generation process in the competitiveness evaluation. As proposed by Aiginger (2006), a formal definition of the two elements of competitiveness is:

Competitiveness =  $W(Y, S, E)$  – definition of “outcome competitiveness”

Competitiveness =  $F(K, L, TFP, C, I, T)$  – definition of “generation process”

Where,

Y – income per capita; S – set of social and distributional indicators; E – set of ecological indicators

K – physical indicators; L – labor; TFP – technical progress; C – capabilities; I – institutions; T – trust

Depending on specific situation, the analysis of “outcome competitiveness” can focus on income, social and ecological indicators, but also on financial sustainability (budget balances, debt), external balance sustainability (trade balance, current account), political stability, even leisure. The processes of creating competitive advantage for firms, regions and nations depend on factors which can change over time. In the early stages of economic development, natural resources and population were the sources of growth and welfare. At an intermediate stage of development the key factor for income growth is investment in physical capital. In the highest stage of development innovation, knowledge creation and diffusion, intangible infrastructure defines the competitive edge. Definition of competitiveness as capacity to create welfare is related to productivity: income will in general be higher if the productivity is higher (Paul K, 1994).

Microeconomic concepts and indicators of competitiveness have a solid theoretical base because they focus on the essential characteristics of producers in competition for market share and profits or ability to export. This ability can be measured by the size or increase of market share, performance, price ratios, cost competitiveness or by multidimensional indicators. Michael Porter’s diamond is the best model in analyzing and defining competitiveness of the firm. According to Porter there are four main determinants of competitiveness of enterprises:

their strategy, structure and rivalry; the demand conditions they face; the factor supply conditions they encounter; the conditions of related industries. According to Porter the competitiveness of a nation has microeconomic foundations. Most discussion of competitiveness and economic development is still focused on the macroeconomic, political, legal, and social circumstances. "These conditions are necessary but not sufficient. They provide the opportunity to create wealth but do not they create wealth. Wealth is actually created at microeconomic level of the economy, rooted in the sophistication of actual companies as well as in the quality of the microeconomic business environment in which a nation's firm compete. Unless these microeconomic capabilities improve, macroeconomic, political, legal, and social reforms will not bear full fruit" . This is the main reason to determine an aggregate indicator as Business Competitiveness Index.

In Porter's opinion almost everything matters for competitiveness: the schools, the roads, the financial markets, customer sophistication, institutions, people and culture. This make improving competitiveness a special challenge, because is no single policy to create competitiveness. The microeconomic efficiency will generate the macroeconomic competitiveness.

### **Business Strategist Perspective**

Unlike the first approach which is based on economic grounds, the Business Strategy approach is from a business studies perspective and is concerned with issues of rivalries between firms and the strategies adopted by firms as they compete which each other locally and internationally. Porter, one of the leading supporters of this school of thought has attempted to study the international economic relations of nations by means of micro level business strategy theory. According to Porter, competitiveness and productivity are the same, since in his opinion the "only meaningful concept of competitiveness at the national level is national productivity", due to the fact that productivity is primarily associated with improving a nation's prosperity and standard of living over time. He developed a "Diamond Model" in which he identified four interrelated factors necessary for sustaining competitiveness, these are: firm strategy, structure and rivalry, demand conditions, related supporting industries and factor conditions (key factors that are created e.g. skilled labour, capital and infrastructure). The government acts as facilitator in this model encouraging firms to become competitive and creating the environment that enables firms to increase productivity and become more competitive by improving the infrastructure and investing in specialized education and engineering etc.

Porter's concept of competitiveness has been integrated into the definition used by the World Economic Forum (WEF). In the 2005-2006 issue of the Global Competitiveness Report

(GCR), competitiveness is summarized as *“that collection of factors, policies and institutions which determine the level of productivity of a country and that therefore determine the level of prosperity that can be attained by an economy. However, productivity is also the key driver of the rates of return on investment, which in turn determine the aggregate growth rates of the economy. Thus, a more competitive economy is one that is likely to grow faster over the medium to long term”*. This definition is very broad and uses a vast number of indicators to formulate the composite indices on competitiveness, namely, the business competitiveness index (BCI) and the growth competitiveness index (GCI). Many countries have gravitated towards this new thought of competitiveness and are compiling indicators on the microeconomic aspects to be able to benchmark their competitiveness against each other. In the Caribbean, Trinidad and Tobago, Jamaica, Dominican Republic and in recent times Guyana are involved in compiling such composite indicators to benchmark their competitiveness against leading developed and other developing countries.

The business strategy perspective has been criticized by Krugman on the assertion that nations compete like corporations on the world markets, he objects to this analogy since “international trade is not a zero sum game but one in which specialization and trade according to comparative advantage results in gains to all nations”. Secondly, the definition of national productivity is said to be unclear and not well defined for computation (it does not specify if total factor productivity or partial productivity indicators should be used). Finally, the role of government is too limited since the presence of market failures constrains the development of competitiveness.

The measures discussed in this paper will focus on the abovementioned perspectives; however, for completeness the third school of thought is briefly mentioned below.

### **Technology and Innovation Perspective**

This approach is rooted in industrial competitiveness. It accentuates the role that enterprises must play in importing technology (via foreign direct investment) and the ability to learn this technology (through training and research and development like), resulting in mastery, improvement and consequently innovation. The innovation and learning process necessitate interactions among different institutions (firms, government, support institutions and other actors) within the National innovative system (NIS). Government has an active role in creating competitiveness under this approach. This theory put forward a definition of micro and macro level competitiveness which is found in OECD (1992) *“In microeconomics, competitiveness refers to the capacity of firms to compete, to increase their profits and to grow. It is based on costs and prices, but more vitally on the capacity of firms to use technology and the quality and*

*performance of products. At the macroeconomic level it is the ability to make products that meet the test of international competitiveness while expanding domestic real income.*” One of main measures associated with the approach is the manufacturing export competitiveness index (MECI), which is used to benchmark manufactured export competitiveness in developing countries. It is constructed using data on the value of manufactured exports per capita, average manufactured export growth over medium to long term and technology-intensive manufacture exports as a percentage of total merchandise exports. This index is thought to be more appropriate for developing countries being more focused in its measurement of competitiveness than those constructed by the WEF. This MECI is somewhat challenging to construct since it is difficult to determine what criteria should be used for selecting exports that are technologically intensive. This is not clearly stated in the methodology.

Other useful measures falling under this school of thought are the market share indicators. The analysis using market shares can vary tremendously depending on the scope required, since market shares can be the ratio of a country's exports to the World export, to the exports of a specific region or even to total exports of the country's major trading partners.

### **Unit Labour Cost as Part of Competitiveness**

The range of competitiveness indicators to include an index of unit labour cost for Enterprise which will serve as a complement to the existing measures. Furthermore, this index of unit labour cost will become part of the statistical landscape and will be computed on a quarterly basis. The unit labour cost measure gives an indication of cost pressures in a given sector or economy. More specifically, unit labour cost can be defined as the ratio of labour compensation to labour productivity (output per man hour).

$$ULC_n = W_n / (Q / H)$$

Where,  $W_n$  represents the nominal wage rate,  $Q$  represents domestic production  $H$  denotes the number of hours worked ( $Q / H$ ) is equal to labour productivity ( $P$ ) Thus,  $ULC_n$  is directly related to the nominal wage rate and inversely related to labour productivity.

There are various combinations of  $W_n$  and  $P$  that would result in either an increase or decrease in  $ULC_n$ . The table below examines those combinations that lead to a decrease in  $ULC_n$ . The converse is true for an increase in  $ULC_n$ .

### **Methods of calculating Unit Labour Costs**

The ULC may be calculated using different indicators of wages and productivity. Firstly, the ULC can be computed as the *ratio of the index of average weekly earnings to the index of productivity*. These two indices are computed quarterly by the Central Statistical Office and



currently have a base year equaled to the average of the four quarters of 1995 = 100. The index of average weekly earnings is a measure of nominal earnings while the index of productivity is derived by dividing an index of domestic production by an index of hours worked. Seeing that the productivity measure is in terms of hours, it would have been ideal to have an index of hourly compensation but such an index was not available.

Secondly, the ULC can be obtained by dividing an index of real average weekly earnings by an index of productivity. This method of calculating unit labour cost is similar to the first method except that it eliminates the effect of inflation from the index of average weekly earnings, which is a value index. By eliminating the effects of inflation, changes in unit labour cost can be attributed to changes in productivity and changes in real wages. After adjusting for inflation, if there is an increase in unit labour cost, this means that real labour compensation is growing faster than labour productivity.

This situation can create inflationary pressures and lead to higher prices. The third method which provides an alternative measure for labour compensation and productivity is the ratio of real compensation to real output. Real compensation was calculated by deflating nominal compensation to employees by the retail prices index. The value for nominal compensation to employee is generated from a Survey of Business Establishments (SBE) which is conducted annually by the Central Statistical Office.

Unlike the first two methods which used output per man hour as the measure of productivity, this method used gross domestic product (GDP) at constant prices. In addition, this SBE survey captures data on compensation to employees by kind and by sector, as outlined in the Trinidad and Tobago System of National Accounts (SNA) 1993.

After some deliberations about which method should be used to calculate an ongoing index of unit labour cost for Trinidad and Tobago on a quarterly basis, the second method was selected, that is, an index of real average weekly earnings divided by an index of productivity). The resulting ULC index carries a base year of 1995, an average of the four quarters of 1995, (1995=100). Since the purpose of computing the ULC index is to gauge the competitiveness of locally produced goods, our focus was principally on the manufacturing sector excluding the energy sector. We also examined the development of historical wages and productivity of the other sectors in the economy on an annual basis using the third method, real compensation to real output.

### **Composite Indices**

In recent times numerous institutions and countries have been developing composite indices that allows for a much broader measurement of national competitiveness. Of the most popular



and widely discussed are those constructed by the World Economic Forum (WEF) and published in the Global Competitiveness Report.

The WEF compiles two complementary composite indices which capture the profundity of national competitiveness, namely, the growth competitiveness index (GCI) and the microeconomic competitiveness index (MICI) or the current competitiveness index (CCI) or business competitive index (BCI) (Marginean Silvia, n.d.). Such indices have been formulated for a few Caribbean countries, namely, Trinidad and Tobago, Jamaica, Dominican Republic and recently for Guyana and benchmark against other developing and developed countries. The GCI measures the capacity of the national economy to achieve sustained economic growth over the medium term. The overall aggregation of GCI comprises three main components that influence economic growth in the medium to long term; these are technological capacity, the quality of public institutions and quality of the macroeconomic environment. Further disaggregation of these indices is possible.

The information used to compile these indices is sourced from both hard and survey data (collected through the Executive Opinion Survey). The indicators used to formulate the technology index includes innovation (which covers areas like research and development spending, patents and tertiary enrollment), technology transfer (which covers foreign direct investment as a source of new technology) and information communication technology (covers school access to internet, enforcement of ICT related laws, mobile and fixed line telephones per capita and number of personal computers per capita).

It is also interesting to note how the weightings were derived. The WEF grouped countries into two groups called the core innovators which consist of countries on the cutting edge of technology (innovators), while, the second group the non-core include those far away from the technology frontier which rely on transfer of technology from abroad. So that in compiling the technology index a higher weight is placed on innovation for countries within the core group than the non-core. For technology transfer a positive weight is given for those countries within the non-core and zero weight to those in the core grouping. Further, the three components making up the GCI were assigned different weights depending on if countries fell within the core or non-core innovators since the importance of the determinants of economic growth will differ between the two groups. Technology index is assigned a larger weight than public institutions index and macroeconomic environment index for the core innovators. For the non-core innovators equal weights are assigned.

The second index, the CCI/MICI/BCI was developed by Michael Porter and is based on his diamond framework on competitiveness. This index concentrates on the microeconomic fundamentals and attempts to measure the conditions that determine a nation's sustainable

level of productivity. It is built on two sub-indices, namely company sophistication index and the quality of the business environment index. The information used to generate the index is obtained mainly from survey data collected from the Executive Opinion Survey, which is subjective. Many variables are used to determine the sub-indices and common factor analysis is used to compute the indices which are then averaged to estimate the overall BCI. The weights are determined using the coefficients of a multiple regression of the sub indices on GDP per capita (Marginean Silvia, n.d.).

The first national competitiveness study based on the WEF methodology was done in 1998 by the Tourism and Industrial Development Company (TIDCO). However, the first available benchmark indices are available from 2001 and is published by the WEF in the Global Competitiveness Report 2002-2003 and done in conjunction with the UWI –Institute of Business.

## CONCLUSION

In conclusion no individual set of indicators is sufficient in explaining the competitiveness at the national level. Each of the methodologies highlighted above is fraught with weaknesses. However, each is crucial in explaining different aspects of competitiveness. Even though the WEF measures are based on many indicators and wider in scope, these are only available on an annual basis. Therefore, the single indicators that are narrower in measurement but available at much higher frequencies could fill the void in the interim. Based on our findings above, we submit the following recommendations.

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