

# THEORETICAL FOUNDATIONS AND MEASUREMENT OF COMPETITIVENESS

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## **Summary**

*Over past decades competitiveness has become a matter of growing interest for academics, businessmen and policy makers who are concerned about the success of firms, industries and nations in a globalised world. Yet, the concept is often criticised for its different meanings and the lack of a comprehensive theoretical framework. Similarly, there is no commonly accepted measure of the concept but a variety of indicators is being used. Existing literature often refers to individual dimensions of this concept thus failing to take into account its multifaceted and multidimensional nature. The objective of this paper is to explore different meanings of competitiveness in search for a common line connecting different dimensions of this concept. It also discusses theoretical foundations of competitiveness suggesting that its underlying principles can be traced to theories of competition, international trade and economic growth. Finally, three main approaches to the analysis of competitiveness (macroeconomic, trade and microeconomic) are critically examined and their interrelatedness is discussed. The general message of this paper is that competitiveness is in its essence a firm-level concept and that the competitiveness of nations depends on the competitiveness of their firms which in turn is determined by a combination of their activities, characteristics and features of their environment.*

**Key words:** *competitiveness, competition, international trade, economic growth, firm behaviour.*

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## 1. INTRODUCTION

Over recent years competitiveness has become a matter of interest for academics, businessmen and policy makers who are concerned about the success of firms, industries and nations in a globalised world. In simplest terms, competitiveness is defined as the ability of an economic entity to compete. However, at different levels of analysis this ability takes a range of meanings - from the relative position of firms on a market to the competitive profiles of their industries and the ability of nations to grow and to provide their citizens with better standard of living. As a consequence, competitiveness is portrayed through a variety of definitions which mostly originate from its measures (Wziątek-Kubiak, 2003). The lack of consensus over definition of competitiveness is a continuous source of debate over its meaningfulness. To this end, it is often neglected that in a world marked by diminishing trade barriers and intensified competitive pressure, different meanings of the concept complement each other as the ability of firms and industries to compete has an important role in explaining the well-being of their nations.

The multifaceted and multidimensional nature of competitiveness is a constant source of debate over theoretical foundations of the concept. For many scholars competitiveness is a relatively new economic concept coming from the business and management literature (Lall, 2001). The use of the term in economics dates back to early 1980s when first reports on competitiveness were published in the USA and Europe.<sup>2</sup> For this reason it is sometimes thought that the concept lacks a comprehensive theoretical framework and its definitions are portrayed as derivatives of its measures (Krugman, 1994; Wziątek-Kubiak, 2003). However, competitiveness refers to ideas which are well founded in competition, trade and growth literature. Within these branches of literature there is a long history of efforts to understand factors related to competitiveness. Furthermore, when brought together, they suggest that competitiveness is a meaningful concept when approached in the context of market imperfections and rivalry among economic entities.

Numerous interpretations of the concept are reflected in its measurement which is being undertaken with the three approaches. In the macroeconomic approach competitiveness is a synonym for economic growth, positive trade balance, higher standard of living and quality of business climate. In the trade approach it is reflected in the specialisation patterns of industries which compete on the international market. Finally, in the microeconomic approach the forms and factors of competition are used to evaluate the ability of firms to compete with other rivals.

The above discussion suggests that there are several open issues concerning the concept of competitiveness which raise doubt about its meaningfulness. Bearing this in mind, the objective of this paper is to assess definitions, theoretical foundations and different approaches to the measurement of competitiveness. To this end,

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<sup>2</sup> According to Group of Lisbon (1993) the term was first mentioned in the "Report of the President on U.S. Competitiveness", published by the U.S. Department of Labour's Office of Foreign Economic Research in Washington D.C. in September 1980. It was followed by the "Report of Industrial Competition" by the European Management Forum in Geneva in 1981.

the paper contends that competitiveness in its essence is a firm-level concept and that different approaches to this concept refer to various elements forming the ability of firms to compete. It also shows that theoretical foundations of competitiveness can be found in a number of economic schools which calls for an eclectic approach to the issue. Finally, it is shown that a variety of competitiveness measures can be brought together under the umbrella of microeconomic approach to this concept.

The paper is structured as follows. The next section brings together some of the definitions of the concept in order to clarify its meaning. The discussion of the theoretical foundations of competitiveness takes place in section 3 where it is shown that assertions about competitiveness can be found in contributions of numerous economic schools. Three main approaches to the measurement of competitiveness will be discussed in section 4. Finally, section 5 concludes.

## **2. WHAT IS COMPETITIVENESS?**

Competitiveness refers to the ability of an economic unit (a firm, an industry, a region or a country) to compete with its rivals. It is associated with rivalry between economic units over markets or access to human and material resources and technology. Different economic units reveal their competitiveness in different ways and, therefore, there is no unique and commonly accepted definition of the concept. For some authors (Krugman, 1994) this implies that competitiveness is not a very useful concept. Others consider the lack of a comprehensive definition as the evidence of its complexity and multidimensionality (Lall, 2001). An important characteristic of competitiveness is its dynamic nature. Sources of competitiveness are not perpetual; sooner or later, rivals come up with better ways of doing things. Thus economic agents can sustain their competitiveness only by making continuous improvements in their behaviour.

### **2.1. Competitiveness at the firm level**

Competitiveness is most commonly defined at the firm-level. In the terminology of Buckley et al. (1988), a firm is competitive if it can produce products of better quality and lower costs than its rivals. At this level, competitiveness is synonymous with a firm's long run profit performance and its ability to compensate its employees while providing superior returns to its owners. Hence, at the firm level competitiveness encompasses three dimensions: cost efficiency, quality and relative performance. Numerous variations of this definition exist in literature. For Porter (1985), competitiveness of a firm is its ability to employ all available resources, that is, internal characteristics, socio-cultural, institutional, economic and technological factors in its environment, in a way that is superior to its rivals. In a similar vein, Ernst (2004) defines a firm's competitiveness in terms of its productivity. A firm is said to be competitive if it can convert its resources into value more efficiently than its rivals. Finally, in the context of international trade, Buckley et al. (1988) define the competitiveness of a firm as its ability to deliver goods which will stand the test of international markets.

## 2.2. Competitiveness at the industry level

The definitions of industrial competitiveness are analogous to those of firm's competitiveness. However, industrial competitiveness inevitably involves territorial dimension. When industry is defined as a group of firms with similar activity from a particular region or country, its competitiveness is evaluated against groups of producers with similar activity from other regions or countries. In this case, the competitiveness of an industry is evaluated on both domestic and foreign markets and an industry is said to be competitive if it is more profitable or serves a larger share of international market than its rivals in other countries (Reiljan et al., 2000). Critiques of such understanding of competitiveness postulate that the profitability or market position of a group of producers from one country in relation to their foreign rivals may be the result of numerous other factors, whose effects would be difficult to distinguish from competitiveness if the emphasis is solely on the relative performance of industry (Yap, 2004). This line of thinking proposes that the competitiveness of industry should be evaluated primarily in terms of factors underlying the ability of its firms to compete such as productivity, cost efficiency or technological intensity.

## 2.3. Competitiveness at the level of the economy

At the level of the economy, competitiveness is defined as the ability to compete with other countries. In the terminology of US Commission on International Competitiveness (1985) a nation's competitiveness is the degree to which it can, under free and fair market conditions, produce goods and services that meet the tests of international markets while simultaneously expanding the real incomes of its citizens. The European Commission (2001) considers competitiveness of a nation to be synonymous with its ability to provide citizens with high and rising standards of living and high rates of employment on a sustainable basis. A somewhat different approach is taken by Hawkins (2006) who defines national competitiveness as the ability of the economy to move towards and/or shift out of the production possibility frontier.

One set of definitions focuses on the ability of nations to create the right environment for their firms. For one group of authors national competitiveness is an issue of macroeconomic performance reflected in relative costs, exchange rates and productivity (Fagerberg, 1996; Porter, 1998; Yap, 2004; Thompson, 2004). Sometimes national competitiveness is defined as the ability to create institutional, technological and socio-cultural environment for attracting foreign investors and enabling own firms to compete abroad (Garelli, 1996; IMD, 1998; Reiljan et al., 2000; Thompson, 2004; Fougner, 2006; Siggel, 2006). Some authors approach national competitiveness through the structure of international trade and as the ability of a nation to compete in industries with higher potential for value added generation (Reinert, 1994; Fagerberg, 1996; Lall, 2000; 2001). Different definitions of national competitiveness are best integrated by Scott and Lodge (1985) who consider the above-mentioned factors as pieces of national competitive potential and argue that the primary subject of national competitiveness are firms who bear the burden of competition with foreign rivals.

The discussion above suggests that at the heart of all definitions of competitiveness is the ability of firms to compete but they diverge on the understanding of the factors and forces from which this ability may arise. The next section will attempt to develop a comprehensive theoretical framework which would bring together these divergent views on the concept of competitiveness. To this end, notions put forward by several schools of thought on the elements which make some economic agents superior to others will first be critically reviewed followed by an attempt to establish a link between them.

### **3. THEORETICAL FOUNDATIONS OF COMPETITIVENESS**

For many scholars competitiveness is a relatively new economic concept coming from the business and management literature (Lall, 2001). The use of the term in economics dates back to early 1980s when the first reports on competitiveness were published in the USA and Europe. For this reason it is sometimes thought that the concept lacks a comprehensive theoretical framework and its definitions are portrayed as derivatives of its measures (Krugman, 1994; Wziatek-Kubiak, 2003). However, competitiveness refers to ideas which are well founded in competition, trade and growth literature. Theoretical foundations of the concept should, therefore, be looked for within this body of knowledge. As a starting point one can take here the relationship between competitiveness and competition. This discussion can be then combined with the predictions of the literature on trade and growth.

#### **3.1. Competitiveness in mainstream economic literature**

As the etymological meaning of the word implies, competitiveness is closely related to competition. The relationship between the two can be explained in the frameworks of both mainstream and heterodox economic literature. The former body of knowledge predicts that rivalry among firms takes place through the continuous search by individual firms for new, more efficient modes of production. This search is expected to lead to the state of competitive equilibrium or perfect competition in which all firms within an industry are identical in size, prices and products while optimal functioning of the market mechanism and the rational behaviour of all agents preclude any possibility of rivalry and supremacy of some firms over others (Knight, 1921; Stigler, 1957; Vickers, 1995). In this context, competitiveness refers to a transitory feature of firm behaviour with the relative position of firms within their industries being determined by differences in their efficiency and where the more efficient firms have an opportunity to seize the market share of their less efficient rivals and to eventually drive them out of the market. Two major weaknesses are usually associated with the above reasoning. First, it is postulated that in emphasising the objective of a firm's behaviour, the neoclassical doctrine omits to explain the methods used by firms to achieve these objectives (Simon, 1955). Second, assumptions such as rational behaviour of agents or optimal functioning of markets are major departures from the

reality as limited cognitive capabilities prevent human beings from processing all the relevant information in a complex world (Fagerberg, 2003).

### 3.2. Competitiveness in Austrian and evolutionary economic literature

Taking these shortcomings into account, alternative (heterodox) schools of thought such as the Austrian or the evolutionary schools suggest that models of imperfect competition, which introduce into the analysis bounded rationality of agents and market imperfections such as economies of scale, information asymmetries or preferences for varieties, are much closer to real world rivalry (Schumpeter, 1934; Winter, 1971; Fagerberg, 2003). In the framework of the Austrian school it is postulated that new profit opportunities motivate individuals to continuously search for previously unthought-of knowledge (Mises, 1949). This line of thinking defines the ability to compete in terms of discoveries which can be used by firms to outperform their rivals by offering products of either better quality or lower prices (Kirzner, 1997). Although rivalry reduces the overall level of ignorance and uncertainty in the market and brings it closer to the notion of competitive equilibrium, the system never reaches this desired state. The main reason for that is the constant change in consumers' tastes, technology of production and availability of resources (Vaughn, 1994). The Austrian school assumes that individuals respond to challenges of competition on the basis of trial and error. Learning about own and others' errors increases the probability that subsequent actions of individuals will be rewarded with appropriate returns.

For evolutionary economists the behaviour of firms consists of routines or learned principles of behaviour while their relative position is determined through the compatibility of these routines with current requirements of the system, analogous to the biological process of natural selection (Alchian, 1950). According to this view, the changing nature of the environment is the reason why the survival of firms depends on their ability to innovate (Schumpeter, 1934; Winter, 1971). It is argued that "*the true type of competition is the competition from the new commodity, new technology, new source of supply, the new type of organisation. This competition commands a decisive cost or quality advantage and strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives*" (Schumpeter, 1942, p. 84).<sup>3</sup> However, it is also emphasised that higher potential rewards from innovations come at the price of more uncertainty about the outcome of individual's actions, which is the reason why risk-averse individuals will be more inclined to imitate the routines which have proven to be successful for other agents (Nelson and Winter,

<sup>3</sup> As Fagerberg (2003) notes, the credit for the first mentioning of the relationship between evolution and innovation go to Marxian economists. According to their view, the evolution of capitalist economies is being driven by technological innovations which determine the relative efficiency of firms. Improvements in efficiency lead to better competitive position and higher profits at the expense of less efficient rivals who are eventually driven out of the market. The weakness of the Marxian view is that it defines innovation only as an introduction of new machinery. However, it served as the starting point for the work of one of most influential evolutionary economists, Joseph Schumpeter.

1982). Since the mass of imitators will eventually reach a critical level, it follows that the superiority of the first innovator has diminishing character. The conclusion is that a firm wishing to continuously remain superior needs to continuously innovate; and this is also the reason why a dynamic approach to competition is needed.

### 3.3. Competitiveness in endogenous growth and resource-based literature

The Austrian and evolutionary logic has served as a basis for several more recent theories of firm behaviour. One of these, the *endogenous growth theory* provides a quality ladder model of firm behaviour in which the R&D investment and stochastic innovations are the main engines of firm's growth (Romer, 1990; Aghion and Howitt, 1992; Grossman and Helpman, 1994; Klette and Griliches, 2000). Although not explicitly addressing the concept of competitiveness, the rivalry with other firms is introduced among the assumptions of the theory. The model predicts that the demand for a firm's products depends on the quality of own and rivals' products which in turn are determined by the ability of firms to undertake foresighted investment decisions (such as R&D investments). These investments, however, depend on the existing and expected profits. Thus, the model suggests that the relative performance of firms (competitiveness) and their behaviour may be in a simultaneous and mutually reinforcing relationship.

Other theories have combined the views of evolutionary economists on firm behaviour with those of industrial organisation and strategic management (Barney, 1991; Conner, 1991; Kogut and Zander, 1992). This literature is more explicit on the issue of competitiveness than any previously mentioned. One strand of literature, the *resource-based view (RBV)*, argues that the ability of a firm to obtain above normal returns depends on its ability to either maintain distinctiveness of its products or to offer products identical to that of competitors at lower prices (Conner, 1991). According to Barney (1991), this distinctiveness is directly related to the ability of the firm to exploit physical capital, human capital and organisational capital resources at its disposal.<sup>4</sup> When these resources are rare, imperfectly imitable and without any substitute, they are said to constitute the firm's competitive advantage which is said to be sustained if it continues to exist after efforts to duplicate it have ceased (Barney, 1991).

Similar to the resource-based view, Porter (1985) develops a model in which firms combine resources and capabilities into one of two types of competitive advantages: cost leadership or product differentiation. The former relates to all situations where firms compete by offering similar products to their rivals but at lower prices, while the latter applies to situations where firms, by offering products which are superior in quality to rivals' products, are able to set price in excess of costs. Besides cost leadership and differentiation which form the firm's competitive advantage within an

<sup>4</sup> Daft (1983) defines firm's resources as "all assets, capabilities, organisational processes, firm attributes, information, the knowledge controlled by a firm that enables it to conceive of and implement strategies that improve its efficiency and effectiveness"

industry, the industry-specific factors determine the level of competitiveness of the firm and its industry. These include five forces: the threat of substitute products, the threat of established rivals, the threat of new entrants, the bargaining power of suppliers and the bargaining power of customers. The strength of each of these five forces determines the profitability of industry in which the firm operates (Porter, 1985).

By postulating that the potential for profit generation differs among industries Porter (1985) continues the long line of thinking started by Smith (1776) that some industries have higher potential for technological innovations and improvements in productivity of labour than others which is the reason why nations specialising in manufacturing are wealthier than those specialising in agriculture. Later scholars have explained asymmetric distribution of profits across industries with differences in their requirement for special skills, or the need for a particularly large amount of investment in capital (Robinson, 1934) or with their innovation intensity (Schumpeter, 1934). It is postulated that the introduction of innovations causes inflow of imitators which has a beneficial effect on the growth of industry, its related sectors and the whole economy. In this context, Fagerberg (2003) highlights the importance of sectors with strong potential for economies of scale and learning. Extending these arguments to the level of national competitiveness, Reinert (1994) concludes that for a nation to be competitive it is not sufficient to be most efficient producer in any of activities but in those activities that provide highest potential for rising of income.

### 3.4. Competitiveness in trade and growth literature

The concept of competitiveness is also tied to the models explaining international trade and its connection with economic growth. Traditional models of comparative advantage and factor endowment explain competitiveness of nations with differences in their resource abundance or in technologies which are treated as exogenous factors (Reinert, 1994; Yap, 2004; Fougner, 2006). Critics of these models are grouped around few arguments. First, it is postulated that scarce inherited factors may be substituted or created (Porter, 1998). Second, the assumption about exogenous and constant technology is said to be a major departure from real world conditions (Barney, 1991). Finally, the empirical evidence does not support predictions of these models (Fagerberg, 2003).

In the new generation of trade models the focus of attention is on technological capabilities as the main determinant of national competitiveness. One stream of this literature predicts that in the presence of market imperfections international trade flows will be determined by technological asymmetries (Posner, 1961). Hence, the competitiveness of a country in particular products is determined by the relation between the complexity of the good's production process and its own level of technological development (Elmslie and Vieira, 1999). It is further assumed that market imperfections are responsible for the fact that there is a time lag between the point when the good is introduced in one country and the point when rivals from other countries begin to imitate it. In the meantime, it is argued, a country can enjoy a monopolistic position in the production of that good.

Along similar lines, Vernon's (1966) theory of dynamic comparative advantages (product-life cycle theory) provides an explanation for international trade between high and low wage countries based on their patterns of technological development. It predicts that from the moment they are introduced until the moment they disappear from the market products exhibit four stages of life-cycle during which their competitive advantage moves from innovativeness to cost-based advantage while their production shifts from advanced to developing countries. An important contribution of the model is that it points out to the cyclical nature of technological development. The model has two important implications for competitiveness. Firstly, it points out that by improving cost-efficiency competitiveness can be improved only until a certain point. When the possibilities for further improvements in cost-efficiency have been exhausted, an economic entity that wishes to stay dominant must introduce a radical change in technology.

Another line of thinking introduces demand for varieties and economies of scale as main determinants of international trade (Krugman, 1980; Krugman and Obstfeld, 2003). Under the traditional view, trade among nations could only be of inter-industry type. New trade theory argues that demand for variety leads to international trade within the same industry. This ultimately leads to the exploitation of economies of scale which otherwise could not exist. In a parallel development, the *endogenous growth theory* has argued that agents undertake innovations motivated by the desire to capture above average returns from the introduction of new products to the market (Grossman and Helpman, 1994). When all these theories are merged, the conclusion is that growth potential of economies increases as international competitive profiles of their industries shift towards products of higher technological and innovative intensity.

### 3.5. Competitiveness and institutional economics

In the previous section it was also mentioned that competitiveness of nations may depend on the quality of their socio-economic environment. This literature has mainly developed along two strands. One group of authors, with roots in institutional economics consider that formal institutions, social and behavioural processes and cultural values have a key role in shaping the behaviour of firms and the outcome of competition (Freeman, 1987; North, 1990; Nelson, 1993; Fagerberg, 2003). The other strand of literature has a narrower view and emphasises the role of regional and local dimensions (Carlsson and Stankiewicz, 1991). It is suggested that the ability of agents to compete is determined by the interaction between firms, government, universities and other organisations whose primary output is knowledge. Porter (1998) develops the diamond model of national competitiveness in which competitive advantage of a nation depends on four groups of variables: factor conditions, demand conditions, related and supporting industries and firms, and the strategy, structure and rivalry where factor conditions refer to the factors of production, demand conditions refer to domestic demand, and supporting industries include internationally competitive supplier and related industries while the firm, strategy, structure and rivalry refer to

the conditions for the creation, organisation, and management of companies as well as the nature of domestic rivalry.

While praised in work of many authors, Porter's view is also criticised for several reasons. Lall (2001) points to several weaknesses of the Porter's model. First, it is argued that this model does not provide a theory of competitive advantage in economic terms. Second, the connections between the firm level and the national level are weak and unsubstantiated in the model. Third, Porter's assertion that factor endowments are not systematically related to innovation is considered as unjustified. It is argued instead that some activities, particularly those that are technology and skill intensive, have higher propensity to create and sustain innovative advantages, and also involve close links to research institutions and universities. Davies and Ellis (2000) address three major disadvantages of the model. First, Porter's thesis that the ability to compete depends on the strength of the diamond in home country may not hold if domestic firms have considerable part of their operations abroad. Second, they suggest that model can be amended in various ways. Third, they argue that firms can draw on diamonds not only in the home country but also in other places which brings the validity of the model into question.

To sum up, several stylised facts about theoretical foundations of competitiveness emerge from the discussion in this section. The first and the most important fact is that there is a long history of efforts to understand factors related to competitiveness. Second, that competitiveness is a meaningful concept only when the market is imperfect and there is rivalry among economic entities. Third, although references to competitiveness can be found in both mainstream and heterodox literature, the assumptions of the heterodox literature provide a more solid framework for the investigation of competitiveness.

## 4. APPROACHES TO MEASURING COMPETITIVENESS

As with its definition, there is no commonly accepted measure of the concept but a variety of indicators are being used depending on the specific unit of analysis. Broadly speaking, there are three main approaches to the measurement of competitiveness: macroeconomic, trade and microeconomic approach. These are being discussed in more detail in this section.

### 4.1. The macroeconomic approach to competitiveness

The macroeconomic approach refers to the ability of national economies to compete with each other. This ability is evaluated with three groups of measures indicating: competitive performance, competitive potential and the ability to create a competitive environment.<sup>5</sup> The terminology of macroeconomic approach is being in-

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<sup>5</sup> It should be noted that there are other types of measures in the macroeconomic approach. Aiginger (2006), e.g., defines measures of international trade and growth as measures of "outcome competitiveness"

creasingly used by governments and different commissions all over the world (Lall, 2001). Such terminology is also well accepted by those for whom it is intended – the voters and the public in general. This is the reason why the macroeconomic approach to competitiveness is at the same time the most controversial and the most popular approach.

The competitive performance of nations is measured by indicators from the trade and growth literature such as the balance of payments and trade and export market share (Barcenilla-Visus and Lopez-Pueyo, 2000; Siggel, 2006) or output or output per capita in both levels and growth form (Fagerberg, 1988; Yap, 2004; Siggel, 2006). Sometimes, both trade and growth are viewed as the means of reaching a higher goal, the maximisation of social welfare (Aiginger, 2006). Critics of these measures suggest that trade performance may have little to do with competitiveness in situations of changing comparative advantages, when economies are inward oriented or when an increase in exports is based on resource endowments or other favourable initial conditions (Krugman, 1994; Lall, 2001; Yap, 2004). Similarly, it has been noted that measures of economic growth cannot distinguish between competitiveness and non-competitiveness related sources of growth (Garelli, 1996; Yap, 2004) and that they may be sensitive to the problem of commensurability in cross-country comparisons (Reiljan et al., 2000).<sup>6</sup>

The competitive potential of nations refers to all those factors which are supposed to form their ability to grow and to provide their citizens with a better standard of living. In a narrower sense this group includes indices such as the real effective exchange rate (REER), relative unit labour costs (RULC) and measures of productivity.<sup>7</sup> In broader sense, the quality of a nation's socio-economic environment can also be included in this group (Thompson, 2004). When the underlying structural factors in an economy are constant REER is supposed to reflect improvements in competitiveness through reductions in relative prices of goods and services (Reiljan et al., 2000; Lall, 2001). Similarly, a lower value of the RULC is expected to reflect the improvements in labour efficiency of one country in relation to other which is interpreted as improvement in its competitiveness, while a deterioration of efficiency and a rise in worker's compensation have the opposite effect. Finally, productivity is, according to Porter (1998, p. 7), the only meaningful concept of competitiveness at the national level. It is expected to underlie higher quality of products, new technology and production efficiency, all of which have important roles in explaining the nation's position on the international market.

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and measures related to ability of nation to create favourable environment for its firms as "drivers of competitiveness".

<sup>6</sup> Reiljan et al. (2000) point out that the conversion of these figures on the basis of exchange rates does not properly reflect ratios of price levels in different countries as these rates depend on supply and demand on the foreign exchange market or on the intervention of governmental institutions.

<sup>7</sup> The REER is commonly defined as the average value of a country's currency in relation to basket of other currencies, adjusted for effects of inflation and weighted by the relative trade balances for each pair of countries included (Yap, 2004; Siggel, 2006). The RULC is defined as ratio of average employee compensation and output between two countries (Fagerberg, 1988; Yap, 2004) while productivity is defined as the value of output produced by a unit of labour or capital (Fagerberg, 1988).

Measures of competitive potential have been criticised on both theoretical and empirical grounds. First it has been suggested that international competitiveness of a country may be subsidised through devaluation policies only for a limited period of time and that there may be reverse causality between the international price position of economy and its macroeconomic performance (Reiljan et al., 2000; Yap, 2004).<sup>8</sup> Second, Aiginger (2006) identifies unemployment, low participation rate and social inequality as factors that may underlie rise in productivity of a nation. Similarly, Yap (2004) postulates that the inclusion of productivity in the analysis at the national level leads to the ambiguous interpretation of various strategies for the promotion of growth. Finally, empirical evidences on the relationship between some of these measures and indices of trade, growth or foreign market share have been ambiguous and do not provide any conclusion on the direction of effect (Kaldor, 1978; Fagerberg, 1988; Yap, 2004).

Indices related to the quality of institutional, cultural, and technological framework in which economic activity takes place generate a new dimension of the concept by shifting the focus of analysis from the ability of national firms and industries to compete internationally to the ability of nations to create a competitive environment and attract foreign capital<sup>9</sup>. The most popular indices within this group are World Competitiveness Index (WCI) calculated annually by International Institute for Management Development (IMD) and Global Competitiveness Index (GCI) published by World Economic Forum (WEF). The former index consists of four groups of sub-indices: business efficiency, economic performance, government efficiency and the infrastructure of an economy. In the Global Competitiveness Index<sup>10</sup> nine separate sub-indices are grouped into three groups: basic requirements, efficiency enhancers and innovation factors (WEF, 2007).<sup>11</sup> The rankings of economies, on the basis of these indicators, are quite similar and high rates of correlation among them have been reported in literature (Thompson, 2004; Hawkins, 2006).

Both WCI and GCI evaluate competitiveness as the country's growth potential. For countries at different stages of development this potential is determined by different factors (Lall, 2001; Yap, 2004). In this context it is suggested that at lower levels of development countries will place more emphasis on the creation of a frame-

<sup>8</sup> One such example is the Balassa-Samuels effect which postulates that in poorer countries the price index will be lower due to lower prices of non-tradable goods (Krugman and Obstfeld, 2003).

<sup>9</sup> Fougner (2006) defines this shift as a change from competitiveness in the sense of aggressiveness to competitiveness in the sense of attractiveness. A similar view is also employed by Porter (1998).

<sup>10</sup> In recent years several changes have been introduced in this methodology. Up to 2000 the Competitiveness Index (CI) was used as a measure of potential for economic growth. Between 2000 and 2007 the measure of macroeconomic competitiveness used by IMD was the Growth Competitiveness Index (GCI) which is said to comprise the CI and level of per capita income (IMD, 2001; Wziatek-Kubiak, 2003). This index consists of three sub-indexes namely, the index for level of technology, the quality of public institutions and for the macroeconomic conditions related to growth.

<sup>11</sup> The group of basic requirements includes institutions, macro economy, infrastructure, health and primary education. Efficiency enhancers are defined as higher education and training, market efficiency and technological readiness. Finally, the innovation factors group comprises business sophistication and innovation.

work for the free and smooth functioning of factor markets while as they progress factors such as market regulations, infrastructure and development of innovation and networking oriented policies will be more important. It has been noted that in construction of WCI it is assumed that the drivers of growth do not differ across countries (Stanovnik and Kovacic, 2000; Lall, 2001). However, the specific context of economies at different stages of development is taken into account in the construction of the GCI. At low levels of development a larger weight is placed on the first group of factors (basic requirements). Similar action is undertaken with efficiency enhancers in the second group of factors while the role of innovation factors is emphasised for highly developed economies.

The criticisms of this group of competitiveness measures have been directed at both their construction and theoretical foundations. On the practical side it has been postulated that many variables used to construct these indices are correlated with the measures of output without being its cause (WEF, 2000). Moreover, the high degree of inter-correlation found between many of sub-indices prevents the use of multiple-regression analysis. Finally, it has been noted that the explanations for the inclusion of particular data sources in the construction of indices or for the preference for qualitative against quantitative data are lacking (Lall, 2001). On the theoretical side, the ability of nations to shape their competitiveness through changes in socio-economic environment in the age of globalization has been questioned. On the one hand, removal of trade barriers weakens the importance of traditional tools of economic policy (Krugman, 1994). On the other hand, governments can actively shape economic activity in the age of globalisation through the provision of basic infrastructure and education, specific industrial policies and by creating institutional framework for the absorption, diffusion and dissemination of technology and knowledge (Yap, 2004; Bienkowski, 2009).

Summing up this part of discussion two important conclusions can be drawn. First, it is evident that several measures used in the macroeconomic approach are in fact aggregates of measures whose origins can be found at the firm-level. Second, it is evident that the macroeconomic approach refers to factors which are intended to facilitate the ability of firms to compete. This suggests that national competitiveness is based on the competitiveness of firms as they are the ones who have to bear the burden of competition.

#### **4.2. The trade approach to competitiveness**

In the trade approach to competitiveness the ability to compete is evaluated by means of measures indicating the structure of products traded among economies, and constructed from data on exports, imports or net trade. One group of measures is theoretically rooted in traditional theories of comparative advantage and relative factor endowments. In this context, the observed trade patterns are supposed to reveal the specialisation of countries in particular products (De Benedictis and Tambari, 2002; Utkulu and Seymen, 2004). Another group of measures, rooted in new trade theories, evaluate competitiveness through the degree of intra-industry trade. This

type of measures is often used in analyses concerned with the catching up process between developing and developed economies. Both groups are criticised for two major weaknesses: their emphasis on the traded sector of the economy and the ambiguous interpretations of the indices.

Within the first group of measures, Balassa index (BI) of Revealed Comparative Advantage (RCA) has been in most widespread use (Balassa, 1965). In its original form, this index is defined as below and takes values between zero and infinity:

$$BI_{CS/W} = \frac{\frac{X_{CS}}{X_C}}{\frac{X_{WS}}{X_W}}, BI \in (0, \infty) \quad (1)$$

where X stands for export, c for a specific country, s for industry and w for the group of countries under consideration (or the world). By providing a quantitative overview of the comparative advantage enjoyed by one country against other countries under consideration, the index distinguishes between countries that reveal comparative advantage in a particular sector and those that do not. Also, it allows for ranking of countries in the order of their competitiveness in a given sector (De Benedictis and Tamberi, 2002).<sup>12</sup>

Despite its popularity, the ability of BI to measure competitiveness is being criticised from both theoretical and empirical grounds (Bowden, 1983; Peterson, 1988; Laursen, 1998; De Benedictis and Tamberi, 2002; Wziatek-Kubiak, 2003; Utkulu and Seymen, 2004). On the theoretical front it is argued that the index reflects competitiveness only when several restrictive assumptions such as constant domestic and foreign demand, the absence of subsidies, import restrictions and any other tools of government intervention capable of influencing trade patterns are met (Bowden, 1983; Wziatek-Kubiak, 2003). If this is not the case it is hard to tell what the index measures and the results can be biased. Some authors emphasise the sensitivity of the index to the size of economy as another potential source of bias in cross-country comparisons (Peterson, 1988; De Benedictis and Tamberi, 2002). Moreover, taking values between zero and infinity with 1 as threshold, the index is asymmetrically distributed which can lead to problems with non-normality if it is employed in the regression analysis (Laursen, 1998; De Benedictis and Tamberi, 2002; Wziatek-Kubiak, 2003). Finally, it has been acknowledged that different conclusions can be obtained from the index when the level of aggregation is changed (De Benedictis and Tamberi, 2002; Wziatek-Kubiak, 2003).

Several other indices have been developed in an attempt to overcome above mentioned shortcomings of BI. One of these, the Michaely index (Laursen, 1998) takes the form of:

<sup>12</sup> There are also other definitions of BI. Peterson (1988) defines it in terms of non-neutrality. The index is defined as neutral when it takes value of unity. Below this threshold, it is said to reflect comparative disadvantage while values above unity signal comparative advantages in a given sector.

$$MI_{ij} = \frac{X_{ij}}{\sum_{i=1}^n X_{ij}} = \frac{M_{ij}}{\sum_{i=1}^n M_{ij}}, M_{ij} \in (-1, 1) \tag{2}$$

with MI representing the index for industry *i* from country *j*, and X and M standing for exports and imports of the same industry and country respectively. The positive values of the index reflect specialisation in the sector and negative ones reflect under-specialisation. While this index solves the problem of re-export as the source of distortion, it also tends to underestimate the results for sectors which make purchases via re-export (Laursen, 1998).

There were also attempts to minimise the problems coming from asymmetric distribution of BI. Vollrath (1991) proposes to take the logarithm of the BI. However, Laursen (1998) notes that such practice leaves the index undefined for sectors in which export of the country is zero and introduces the index of Revealed Symmetric Comparative Advantage (RSCA) defined as:

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}, RSCA_{ij} \in (-1, 1) \tag{3}$$

where *i* and *j* are the same as previously and which is supposed to be normally distributed.<sup>13</sup>

In another group of measures, trade competitiveness of nations and industries is measured through the degree of their intra-industry trade. The common starting point for this line of thinking is the thesis that a higher degree of intra-industry trade is to be found among countries at similar levels of development (Krugman and Obstfeld, 2003). From there it can be concluded that for developing economies an increased value of indices of intra-industry trade signals catching up with their developed counterparts. The most popular measure of intra-industry trade is the Gruber-Lloyd index which for industry *i* from country *j* can be defined as

$$GL_{ij} = 1 - \frac{|X_i - M_i|}{|X_i + M_i|}, GL_{ij} \in (0, 1) \tag{4}$$

<sup>13</sup> There have been also other attempts to deal with these issues. Bender (2001) introduces Trade Specialisation Index (TSI) which is defined as:  $TSI_{ij} = \sum_{i=1}^n \left[ \frac{|X_i - M_i|}{\sum_i (X_i + M_i)} \right]$ ,  $TSI_{ij} \in (0, 1)$

where a value of one means full specialisation and *i, j, X* and *M* being same as before. Vollrath (1991) proposes the Relative Trade Advantage Index (RTA) in form:

$$RTA_{ij} = \frac{X_{ij}/\sum_i X_{ij}}{\sum_j X_{ij}/\sum_i \sum_j X_{ij}} - \frac{M_{ij}/\sum_i M_{ij}}{\sum_j M_{ij}/\sum_i \sum_j M_{ij}}, RTA_{ij} \in (-\infty, +\infty)$$

for an industry *i* from country *j* where values below zero reflect comparative disadvantage, those between zero and one neutrality and those above one the comparative advantage.

where higher values of the index imply higher degree of intra-industry trade and hence higher competitiveness. It should be noted that all measures within the trade approach suffer from the same problem as that present in the original Balassa's index, i.e. they focus only on traded sector of an economy. Moreover, problems inherent in BI, i.e. sensitivity to level of aggregation and interventions remain weaknesses in all of them. These shortcomings limit the usefulness of findings on competitiveness based on the trade approach.

### 4.3. The microeconomic approach to competitiveness

In the microeconomic approach measures of competitiveness can be divided into measures of competitive performance and the competitive potential. Within the former group the most widely used are market share and profitability. In the latter group, competitiveness is evaluated through forms of competition, i.e. competition in prices or quality and characteristics of firms such as the unit cost of production or productivity. A broader dimension of competitive potential of firms also includes many elements which belonged to the previous two approaches to competitiveness such as the quality of institutional environment, industrial networks, government policies, etc. When this is the case, competitiveness becomes a multidimensional concept which depends on factors and forces from different levels of analysis.

The most widely used measures of competitive performance are profitability and market share. When expressed in relative terms, the former reflects the ability of a firm to make returns which are superior to the returns of its rivals. However, it is incapable of distinguishing between firms which are sacrificing their profits for the sake of higher returns in the future and their rivals who are truly uncompetitive (Buckley et al., 1988). The evaluation of competitiveness through market share of firms rests on the thesis that their ability to seize market of rivals is a consequence of improvements in their competitiveness (Wziątek-Kubiak, 2003). However, it has been noted that changes in market share can be interpreted as indicators of competitiveness only when changes in domestic and foreign demand follow similar trends. Moreover, changes in the market share of a firm may come as consequence of dumping practices which have little to do with competitiveness (Buckley et al., 1988). For these reasons it is commonly considered that measures of competitive performance, when treated alone, have ambiguous interpretations and that the analysis of competitiveness has to take into consideration factors which lead to improved ability to compete. This group of measures is known as measures of competitive potential.

Measures of competitive potential are usually derived from definitions of competitiveness. In one group of studies this potential is defined in terms of ability to undersell rivals (Warren, 1999). However, as price indices may have ambiguous interpretation, i.e. higher prices may be an indicator of better quality and also of deteriorating price-competitiveness, this ability is measured indirectly through factors such as costs, productivity and unit export values (Wziątek-Kubiak, 2003). The most frequently employed measure of costs are the unit labour costs (ULC) which has been defined earlier as the ratio of labour compensations per employee and labour produc-

tivity. Such definition implies that firms can be competitive either by reducing costs of employees or by increasing their productivity (Buckley et al., 1988). However, it has been acknowledged that unit labour costs may be affected with unit intermediate costs, productivity of capital and the costs of learning (Wziątek-Kubiak, 2007).

Price competitiveness is also being evaluated in terms of export unit values which are defined as the ratio of the value of exports to its quantity (Aiginger, 1998; Fischer, 2007). This measure is primarily used as a measure of industrial competitiveness on international markets. The lower value of this indicator is considered as a sign of improved price competitiveness. Yet, Fischer (2007) notes that changes in the composition of export rather than deteriorating price competitiveness can underlie observed changes in export unit values which is the reason why they are much more frequently treated as an indicator of quality competitiveness. In this context, it is supposed that better quality of products enables firms to expand its market share and achieve higher margins at the same time. To avoid ambiguous interpretation of the index, Aiginger (1998) proposes that conclusions should not be drawn about the meaning of index without considering the balance of trade between trading partners for a given product. Hence, if unit values reflect costs the countries with lower costs should be net exporters and countries with higher costs should be net importers of a given product. Yet, if a producer is net the exporter and has higher unit export values, this should be interpreted as its competitiveness in terms of quality (Aiginger, 1998). Fischer (2007) concludes that the unit export value is much closer to meaning as a measure of price competitiveness at the highly disaggregated levels while at high levels of aggregation it is possible to determine whether it reflects price reductions or quality upgrading.<sup>14</sup>

In the context of competitive potential it is also stressed that an important role is played by technology and research & development. Innovation leads to greater flexibility of firms, enables them to differentiate and to seize market share of their rivals while achieving above-average returns at the same time. The most frequently employed measure of innovation is innovation expenditure (Kemp et al., 2003; Loof and Heshmati, 2006).<sup>15</sup> Yet, it is often criticised on the basis that lower amount of own expenditures on innovations may simply reflect the fact that innovation is being developed in cooperation with universities or other firms. For this reason it has been suggested that much better measures of innovation are those focusing on its output such as the turnover generated from sales of new products (Klomp and Van Leeuwen, 2001; Loof and Heshmati, 2002) or the number of registered patents and product announcements (Acs and Audretsch, 1987). It has, of course, been noted that the number of patents presents only an intermediate (and possibly incomplete) measure of innovation output (Kemp et al., 2003). The problem with new product announcements as a measure of output in cross-country comparisons is the selection of relevant sources

<sup>14</sup> This is explained with the fact that at high levels of disaggregation there may not be two-way trade in particular groups of products among countries.

<sup>15</sup> Here, a distinction is usually made between R&D expenditure as narrower category and innovation expenditure which goes beyond it and includes also investment in human capital, purchase of new software, machinery and equipment etc.

in which the new products are announced. Kemp et al. (2003) conclude that the sales from new products are the most robust measure of innovation output which includes the entire innovation process.

## 5. CONCLUSION

Over recent years the concept of competitiveness has gained considerable popularity among academics, policy makers and businessmen. The widespread use of the concept and its applicability to an array of economic entities has created confusion over its meaning. Most of definitions describe competitiveness in terms of its measures thus failing to encompass its multidimensional and multifaceted nature. However, when these definitions are brought together, a common line can be revealed connecting them. In one way or another, these definitions refer to different aspects of the ability of firms to compete.

Other sources of confusion over competitiveness are its theoretical foundations. Mainstream economists often describe competitiveness as a meaningless concept. As it has been shown in this paper, neoclassical doctrine indeed provides little support to the concept in whose essence lies the ability of economic agents to outperform their rivals in the long run. Nevertheless, in the presence of market imperfections competitiveness becomes a meaningful concept. In this context, assertions to competitiveness can be found in a number of economic schools from Austrian and evolutionary economics, over trade and growth literature to institutional economics. Bringing these different strands of literature together, a line can be established going from the ability of nations to grow and to provide their citizens with better standard of living towards the competitiveness of their industries and firms, which in turn is determined by a combination of their activities, characteristics and features of their environment.

The ambiguity over meaning and theoretical foundations of competitiveness reflects itself also in its measurement. The critical review of existing competitiveness measures suggests that these measures refer to different aspects of firm's ability to compete which, as argued earlier, forms the backbone of national competitiveness. This ability is best addressed in microeconomic approach. By establishing a link between competitive performance and competitive potential of firms this approach comes closer to the notion of competitiveness as the outcome of rivalry than any of other two approaches. Furthermore, this approach encompasses elements from other two approaches to competitiveness by making them constituent elements of the competitive potential of firms.

Putting pieces of this discussion together, it can be argued that the principal reason for confusion over meaning, theoretical foundations and measurement of competitiveness is the failure to take into account its multidimensional nature. Competitiveness encompasses elements present at firm, industry and economy level. Nevertheless, in its essence, it is a firm level concept as the ability of industries and economies to compete in the end comes down to the outcome of competitive battle

at firm level. Furthermore, the assertions to competitiveness in numerous economic schools suggest that the solution to controversies behind theoretical foundations of concept could be in an eclectic approach to the issue.

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## TEORIJSKI TEMELJI I MJERENJE KONKURENTNOSTI

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### **Sažetak**

*U posljednjem desetljeću konkurentnost postaje sve zanimljivija tema za znanstvenike, poslovne ljude i tvorce politika, koje zanima uspjeh tvrtki, industrija i nacija u globaliziranom svijetu. Ipak, koncept često kritiziraju zbog različitih značenja i nedostatka sveobuhvatnog teoretskog okvira. Jednako tako, ne postoji opće korištena mjera koncepta, već se koriste mnogobrojni indikatori. Postojeća literatura često spominje pojedinačne dimenzije ovog koncepta, ne uzimajući u obzir njegovu višedimenzionalnu prirodu. Cilj ovog rada je istražiti različita značenja konkurentnosti u potrazi za zajedničkim faktorima koji povezuju različite dimenzije ovog koncepta. Rad se također bavi teoretskom podlogom konkurentnosti, sugerirajući kako se njezina temeljna načela mogu pronaći još u teorijama tržišnog natjecanja, međunarodne trgovine i gospodarskog rasta. Na kraju, kritički se ispituju tri glavna pristupa analizi konkurentnosti (makroekonomska, trgovinska i mikroekonomska), te se obrađuje njihova međusobna povezanost. Glavna poruka ovog rada je kako je konkurentnost u svojoj biti koncept na razini tvrtke, pa konkurentnost nacija ovisi o konkurentnosti njihovih tvrtki koju pak određuje kombinacija njihovih aktivnosti, karakteristika i obilježja njihove okoline.*

**Ključne riječi:** konkurentnost, tržišno natjecanje, međunarodna trgovina, gospodarski rast, ponašanje tvrtki.

**JEL klasifikacija:** B10, B20, D21, O30

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