SUSTAINABLE COMPETITIVENESS AT THE NATIONAL, REGIONAL, AND FIRM LEVELS

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Definition

The survival and success of organizations and various agents increasingly depends on competitiveness, broadly defined as the ability to compete. Competition enables the efficient functioning of markets, and adds pressure on organizations to improve their existing goods and services and innovate new ones (Berger 2008). The term competitiveness originates from the Latin word *competer*, which according to Webster's English Dictionary means involvement in a business rivalry for markets. However, competitiveness is a complex and multidimensional concept commonly applied at multiple levels, for example those of national, regional and firm. A common conception is that competitiveness is by its nature a relative notion, inherently implying the aim of competing to perform better compared to rivals in terms of for example access to resources. The meaning and relevance of the concept have been under discussion especially during the past few decades, but the debate has gained increased momentum in recent years, as the notion of sustainable competitiveness has emerged as a new research direction.

Both competitiveness and sustainable competitiveness have been defined in various ways, and though dozens of researchers from differing disciplines have contributed to their research, a consensus on the definitions has not been reached. However, following Porter (1990), many researchers do agree, that productivity is at the very heart of competitiveness (Bhawsar & Chattopadhyay 2015; Doyle & Perez-Alaniz 2017; WEF 2011). Porter defined competitiveness at the firm level as productivity growth reflected through lower costs or differentiated products enabling premium prices (Porter 1990). On a national level, some commonly cited definitions have been those of the World Economic Forum (WEF). The WEF defines competitiveness as *"the set of institutions, policies and factors that determine the level of productivity of a country"* (WEF 2011), measuring it through national determinants of competitiveness such as infrastructure, higher education and training, and technological readiness. Sustainable competitiveness, in turn, is defined as *"the set of institutions, policies, and factors which make a nation productive over the long term while ensuring social and environmental sustainability"*, and measured through e.g. management of renewable resources, environmental degradation, and access to sanitation and healthcare in addition to the original determinants of competitiveness (WEF 2015). Notably in this context, sustainable competitiveness refers to social and environmental sustainability, while previous literature has also discussed sustainable competitiveness as a time-related concept, i.e. competitive advantage is only temporary, or the organization is able to maintain or improve its competitive position. These definitions serve as a starting point for discussing the diversified dimensions of competitiveness and sustainable competitiveness.

Different levels of competitiveness

Global warming, the loss of biodiversity, depleting natural resources, pollution, and other severe problems deriving from human activities and the unsustainability of the present lifestyle have risen to political agendas globally. Consequently, nations, regions, firms, and consumers are increasingly starting to acknowledge the importance of competing and consuming in an environmentally and socially sustainable fashion.

This chapter provides an overview on competitiveness and sustainable competitiveness at different levels of analysis. One of the reasons for the lack of clear definition for competitiveness is the concept's application at these various levels of analysis, for example those of national, regional, and firm (Bhawsar & Chattopadhyay 2015). In fact, some researchers view the concept of competitiveness as applicable only for firms, while others find nations and regions better suitable. As a result, the definition and meaning of the concept are best discussed separately at each level, though the concepts are heavily interlinked. Laws, regulations, and incentives at the national level drive or hinder the development of regional and firm-level competitiveness as they create the preconditions for regions and firms to build their competitiveness. Similarly, regional politics steer and create better conditions for improved firm-level competitiveness. This chapter will first describe competitiveness at the national, regional, and firm levels, and then move on to address each of them from the perspective of competing sustainably. The measurement of the concepts and future directions are also discussed (Figure 1).

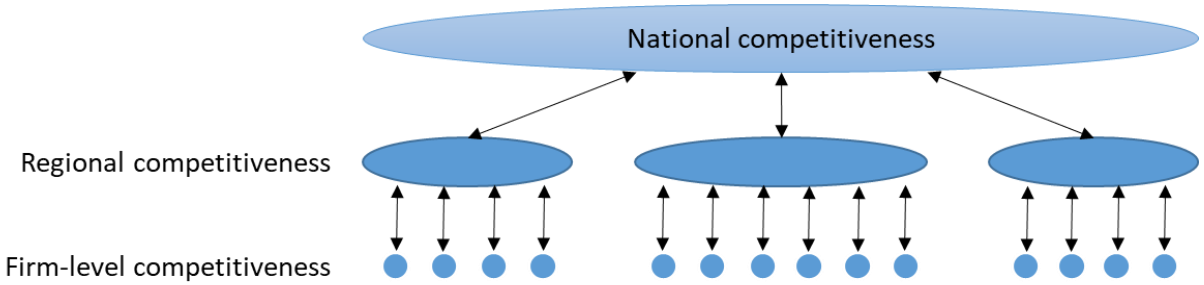

Figure 1. The inter-relations between national, regional, and firm-level competitiveness

National-level competitiveness

The reasons behind the success and prosperity of nations have been a central area of interest for researchers since the seminal works of political economists Adam Smith (1776) and David Ricardo (1817). National competitiveness has received growing interest in particular in politics and academia, despite its elusive and complex nature. The elusiveness of the concept stems from the fact that national competitiveness has no clearly defined meaning nor can be measured and captured by unambiguous indicators (Cellini & Soci 2002). The very existence of the concept of national-level competitiveness is sometimes questioned, as some researchers follow Krugman's (1994) well-known assertion that only firms, not nations, compete with each other (e.g. Cellini & Soci 2002). Krugman's argument is based on the idea that countries do not have a bottom line and do not go out of business like firms do. Additionally, international trade is not a zero-sum game, unlike the competition for market shares between companies (Krugman 1994). Others argue that nations do compete over investments and key resources, which makes competitiveness a vital aspect to analyze and consider (Camagni 2002). Regardless, politicians and governments around the world have adopted this concept as part of their vocabulary, attempting to develop policies for promoting the competitiveness of their countries at both regional and national levels (Berger & Bristow 2009).

Early theories upon which research on competitiveness has later built, were Adam Smith's (1937) theory of absolute advantage dating from 1776, and David Ricardo's (1971) theory of comparative advantage dating from 1817. Smith saw trade as a positive-sum game, where each nation could benefit from international division of labor, i.e. concentrating on what it could do best, instead of attempting to produce and manufacture everything by themselves. In Smith's view, a country had an absolute advantage over other countries in the goods in which it should concentrate. Ricardo challenged this view by coining the concept of comparative advantage. According to the theory of comparative advantage, an inferior country might not have absolute advantage in any good, but it should then specialize in the area where it has the least absolute disadvantage, enabling it to still benefit from international trade with other nations (Cho & Moon 2001, p.7).

In the 1990s, the significance and definition of competitiveness were under intensive debate. Krugman (1994) argued that focusing on national competitiveness was dangerous, possibly resulting in misguided economic policies, protectionism and trade wars. Others countered his arguments (Thurow et al. 1994). Again, the difficulty of defining competitiveness and finding descriptive measures for it hindered the debate (Cho & Moon 2001, p.22). For this purpose, Michael Porter constructed the diamond model (Porter 1990).

Porter's framework proposes four country-level factors that shape the competitive environment of companies in ways that either promote or restrain their competitiveness, determining their competitive advantage: 1) factor conditions; 2) demand conditions; 3) related and supporting industries; and 4) firm strategy, structure and rivalry. Additionally, government and chance are also viewed as significant outside variables. *Factor conditions* refer to the inputs needed to compete in an industry: e.g. skilled labor, natural resources, capital, and infrastructure. *Demand conditions* are composed of the nature of customer needs, the magnitude of demand and its growth rate, as well as the rate of internalization of domestic tastes. Thirdly, the existence of internationally competitive *related and supporting industries* play a major role in improving national competitiveness through access to components and machinery as well as expertise and cooperation in e.g. innovation. Finally, *firm strategy* and the national environment where firms are founded, managed, and organized, as well as the nature of domestic competition all have an effect on national competitiveness. Combined together, the diamond represents the interrelationships between each of the factors: the effect of one attribute often depends on the state of the others. (Porter 1990) The diamond model has been criticized over understating the government's role and not taking into account multinational activities, and it has been extended later (Rugman 1991)(Figure 2).

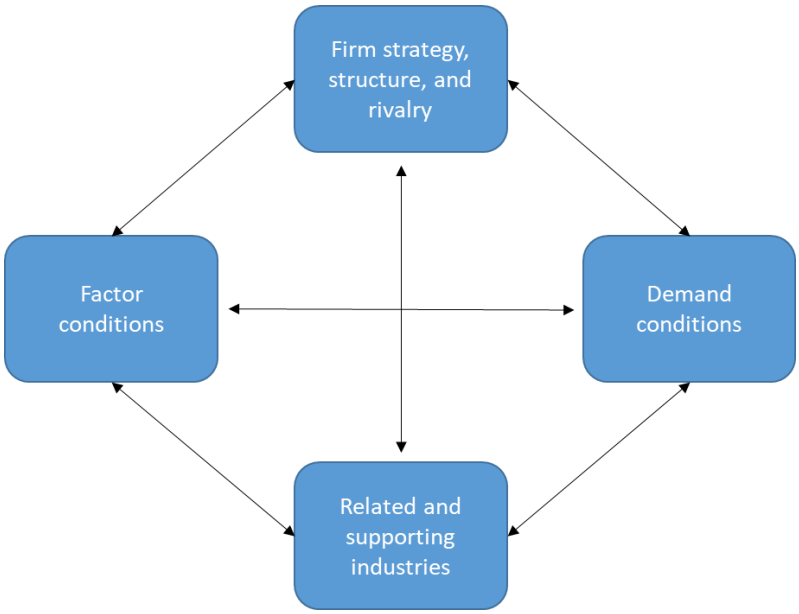

Figure 2. The diamond model depicting the determinants of national competitive advantage (Porter 1990)

Presently many authors follow Porter's assertion, and agree on the definition of competitiveness as productivity (Annoni & Kozovska 2010), though there are a number of other measures, and some view the simplest notion of productivity as output per worked man hour as too narrow. According to the productivity view, the main goal of a nation is to increase the productivity in the use of a nation's resources in order to raise the standard of living for its citizens (Annoni & Kozovska 2010).

However, some of the most publicly discussed views on national competitiveness are often not those of researchers, but those of institutions the likes of The US Council on Competitiveness, and The World Economic Forum (WEF). The US competitiveness council defines competitiveness as productivity, which is measured as output per worked man hour. Both the quality and features of the output and the efficiency of its production determine productivity (Thore & Tarverdyan 2016). The WEF, on the other hand, recognizes twelve pillars it regards as having a causal effect on national competitiveness. These pillars include institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation (WEF 2011). The two perspectives of these institutions may be seen as competing or complementary. Following the complementary view, the other one emphasizes the outputs of the competitiveness process, whereas the other stresses the explanatory factors, the inputs, of the process (Thore & Tarverdyan 2016). WEF's measurement of national competitiveness also covers the productivity perspective comprehensively and in detail (Doyle & Perez-Alaniz 2017).

Regional-level competitiveness

A stable and well-structured context at the national level improves the opportunities for competitiveness and wealth-creation at the firm level but does not create value by itself (Annoni & Kozovska 2010). Between these two layers resides the concept of regional competitiveness. Regional competitiveness is analyzed at the city, locality, urban, or territory levels, or as bloc competitiveness, such as in the EU, BRIC countries, or the Scandinavian countries (Balkytė & Tvaronavičienė 2010). A common definition for regional competitiveness is that adopted by the European Commission, where it is a region's "ability to offer an attractive and sustainable environment for firms and residents to live and work." (Annoni & Dijkstra 2013). In this definition, sustainability refers to the temporal aspect of a region being competitive in the long term (Dijkstra et al. 2011). As mentioned when defining the concepts in the beginning of this chapter, the concept of sustainable competitiveness has also been widely studied as time-related. Strategy scholars have attempted to identify ways for gaining sustainable, i.e. durable, competitive advantage to outperform competitors (Barney 1991), which is what is described by the aforementioned definition at the regional level, too.

Similarly to the competitiveness concept as a whole, regional competitiveness has also been enthusiastically adopted as one of the most important concepts of regional politics. The aim is to create policies that foster the determinants of regional competitiveness (Bristow 2010, p.4). However, like the competitiveness concept itself, the definition and operationalization of regional competitiveness are not unanimously agreed-upon. Krugman's (1994) critique on national competitiveness applies correspondingly to this concept, as there is dispute on e.g. whether regions actually compete with each other. Regions are entities that do not enter or exit markets or by themselves act, like organizations do (Boschma 2004).

The two central differences between national and regional competitiveness are (Aiginger & Firgo 2017, p.159): firstly, absolute (dis)advantages, following Smith, are more important than relative advantages, following Ricardo, at the regional level (Camagni 2002), and secondly, spatial interrelations play a more significant role, as well as the connections between different levels of networks, such as local, regional, and inter-regional (Cellini & Soci 2002). One of the central arguments of the regional competitiveness literature is that non-economic factors such as cognitive, social, cultural, and institutional ones are essential for knowledge creation, learning, and economic development (Boschma 2004). Though spatially bounded and more enduring than the

economic factors, these are less concrete: they are shaped and reproduced through the interaction between local actors in the region (Lawson 1999).

Regional competitiveness has been increasingly the focus in policy making since the 1990s, and a number of related indicators for measuring and operationalizing the concept have been developed (Bristow 2005; Boschma 2004). Regional competitiveness affects firm competitiveness in the global economy, as for instance geographical concentrations of linked industries, clusters, increase their importance, and the availability of knowledge and technology based tools vary heavily both within and between countries (Annoni & Kozovska 2010). The importance of regional competitiveness is reflected also in the notion that geographical proximity facilitates innovation and interactive learning between actors (Boschma 2005). E.g. high regional concentrations of innovation capabilities foster the national rate of technological change and increase technological innovations (Antonelli 2000). Knowledge networks, e.g. between universities and the business community, are recognized as important to the economic success and competitiveness of regions (Huggins & Johnston 2009). Attracting creative, educated workforce is one of the key considerations of regional policies in maintaining and improving a region's competitiveness (Malecki 2007).

Firm-level competitiveness

Competitiveness as a concept is most commonly applied on the firm level (Berger 2008). Firms, not nations, are understood to compete in international markets (Porter 1990), leading to the argument that competitiveness of a nation stems from companies within that nation. Thus, the competitiveness of a nation is not simply based on country-specific factors but strongly influenced by firm- and industry-specific factors as well (Cho 1998). On a very basic level, a firm is seen as competitive, if it is able to serve a market and obtain profits (Cellini & Soci 2002). Otherwise it will go out of business.

At the firm-level, especially the market-based view and the resource-based view explain how to achieve competitiveness (Berger 2008). The market-based view asserts that environmental conditions such as the structure of a market influence companies and their conduct. A firm's ability to adjust its strategy following changes in the external environment leads to different performances (Porter 1981). The resource-based view, on the other hand, sees the competitiveness of a firm as a result of successful utilization of internal resources (Wernerfelt 1984). Only certain types of internal resources act as a source of competitive advantage (Prahalad & Hamel 1990). In the firm-level competitiveness literature, competitive advantage is needed in order to achieve competitiveness. The view of productivity as a measure of competitiveness regards productivity either in terms of lower costs compared to competitors, or the ability to offer superior products in terms of customer value, justifying a premium price (Porter & van der Linde 1995).

There are numerous ways of achieving competitive advantage, and in this vein, especially temporally sustainable competitive advantage has come to be something seen as worth pursuing. The traditional framework suggests that firms may obtain sustained competitive advantages through responding to environmental opportunities and neutralizing external threats, implementing strategies to exploit their internal strengths, and avoiding internal weaknesses (Barney 1991).

Sustainable competitiveness

Sustainable development has often been broadly defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). As global warming, the loss of biodiversity, pollution and other crucial issues deriving at least partially from the harmful actions of companies have risen to political agendas globally, the demand for sustainable business practices by governments, regions, communities, and consumers has increased. To this end, in 2011 the WEF developed a framework for assessing the sustainable competitiveness of nations, defining sustainable competitiveness as

"the set of institutions, policies, and factors that determine the level of productivity of a country while ensuring the ability of future generations to meet their own needs" (WEF 2011). Thus, sustainable competitiveness implies ensuring economic development through being productive while utilizing natural resources in a way that future generations will be able to benefit from them as well.

The concept of sustainable competitiveness as a combination of sustainable development and competitiveness (Weiss 1993) has not been very extensively researched so far, although both notions have received ample interest as separate entities. Similarly to competitiveness, sustainable development is a broad and complex concept, for which there is no unanimously agreed unambiguous definition. Earliest views on the topic stressed the combination of environmental protection and economic growth, and this is also the stream that has received most attention from scholars (Thore & Tarverdyan 2016). More recently, scholars have started to take into account also the social aspect of sustainability (Doyle & Perez-Alaniz 2017).

Traditionally, at the firm-level the relationship between competitiveness and environmental sustainability goals has been seen as a tradeoff between costs to the industry and benefits to the society (Porter & van der Linde 1995; Wade-Benzoni 1999). However, the notion that sustainable, specifically eco-friendly practices can in fact act as a source of competitive advantage has been advanced since the 1990s (Elkington 1994; Porter & van der Linde 1995). These early articles on the positive environmental sustainability-competitiveness relationship can be viewed as predecessors to the contemporary concept of sustainable competitiveness, which comprises of economic, environmental, and socio-political dimensions (WEF 2011; dos Santos & Brandi 2014; Doyle & Perez-Alaniz 2017). In fact, from a national competitiveness perspective, according to WEF's (2012) Global Competitiveness Report 2012-2013, there might not often be any trade-off between acting sustainably and achieving high competitiveness. They conclude that many of the countries topping the competitiveness rankings also perform best in many aspects of sustainability, so aspiring for sustainable competitiveness is by no means a self-contradictory goal.

National and regional sustainable competitiveness

On a national level, sustainable competitiveness is studied through identifying related success factors and the key drivers promoting it (Balkytė & Tvaronavičienė 2010). The debate has moved on from the perspective of a tradeoff between economic and environmental factors, as notions such as circular economy and inclusive growth have supported the discussion on considering both consumption and production systems and the environment and society as a whole (Doyle & Perez-Alaniz 2017). However, the concept has so far received relatively little attention, and only a handful of articles have addressed national sustainable competitiveness (e.g. Thore & Tarverdyan 2016; Doyle & Perez-Alaniz 2017).

Nevertheless, national sustainable competitiveness is seen as an important area, since finding a suitable combination of technology and the planet's carrying capacity could enable sustainable growth in spite of the limitations on resources (WEF 2014; Wade-Benzoni 1999). National-level laws and regulations play a critical role in emphasizing sustainability and steering regions and firms towards pursuing it, and the same is true on a regional level. Currently it seems that the most notable progress on national sustainable competitiveness has been achieved at an institutional level, and very few critical research articles have been published, evaluating and testing the validity and robustness of the concept and its measures.

On a regional level, sustainable competitiveness has received almost no attention so far, with the exception of the construction of a European Regional Sustainability Competitiveness Index (RSCI) (Bilbao-Terol et al. 2017). Regional sustainable competitiveness needs more consideration, as it is likely to be one of the key areas of progress in this field in the future. Furthermore, sustainability concerns have not been addressed nearly at all on a regional level even in the institutional rankings and indices, although regional competitiveness is a key topic in current policymaking in many countries.

Firm-level sustainable competitiveness

In terms of firms, the beginning of the 1990s saw researchers engaging in a debate over whether "it pays to be green" (Porter 1991; Walley & Whitehead 1994; Porter & van der Linde 1995). The argument was that searching for environmentally superior solutions increases innovation and results in applying more efficient and effective technologies (Porter & van der Linde 1995). In addition to motivating factors such as potential competitive advantage, potential differentiation advantage and a genuine concern for the environment, legal and regulatory actions by nations and regions, as well as societal attitudes pose challenges for companies and may prompt them to innovate in an environmentally-conscious manner to improve and secure their competitiveness (Porter 1991; Varadarajan 1992). Eco-friendly actions may improve firms' efficiency and provide cost advantages (Hart & Ahuja 1996). It has, however, been questioned, if eco-friendly practices actually yield competitive advantage in the long term, and if greener products are able to compete against traditional products on their technical performance (Wong et al. 1996; Walley & Whitehead 1994). Later on, the debate progressed into analyzing the circumstances under which firms may be able to offset the costs of cleaner technology investments (Reinhardt 1998).

As sustainability has become an increasingly critical factor to consider, corporate social responsibility (CSR) practices, green innovations, and legislation have gained importance as ways of creating or prompting firms to create competitive advantage through sustainable actions (e.g. Smith 2007; Triebswetter & Wackerbauer 2008; Ambec et al. 2013). Firms are developing environmental innovations driven by regulatory pressure, customer pressure, and the quest for competitive advantages and technological leadership (Triebswetter & Wackerbauer 2008). Firms are also increasingly starting to recognize the potential negative effects of pollution, climate change, and resource scarcity, and have begun to take more of an interest in sustainability issues (WEF 2014).

The notion that well-designed policies regulating the actions of firms can actually enhance competitiveness, also known as the Porter Hypothesis (Porter 1991; Porter & van der Linde 1995), countered the until-then traditional view of environmental regulation restricting the options and profits of firms. According to the Porter Hypothesis, tighter but thoroughly designed regulation can trigger firms to innovate in ways that may offset the costs of complying with them at least partially or even more than fully. The reasons for this include e.g. the fact that regulation reduces the risks and uncertainty related to investments into environmental innovation, regulation generates pressure thus motivating innovation, and regulation points out likely resource inefficiencies and potential avenues for technological improvement. Especially in the short term, the costs of complying with the regulations may not be completely offset until the costs of new products or processes can be reduced through learning (Porter & van der Linde 1995).

More recent research on the Porter Hypothesis is divided into two parts: research on 1) whether regulation actually stimulates innovation, and 2) whether this innovation actually yields better firm performance. In terms of the first part, researchers have mostly found a positive link between environmental regulation and innovation, while the second part has led to more mixed results, although more recent studies have found more supporting results (Ambec et al. 2013). Still, discussion on the Porter Hypothesis has been heated, and especially the second part of the research has received ample criticism (see e.g. Jaffe & Palmer 1997).

What then, does the Porter Hypothesis mean, when it stresses well-designed regulation for improving competitiveness? According to Porter and van der Linde (1995), regulation should be flexible enough to maximize the opportunity for innovation and to allow the industry itself to choose its approach. It should also foster continuous improvement, instead of determining a particular technology for adhering to the standards, and there should be little to no uncertainty in the regulatory process. In general, regulations should be flexible, market-based instruments, such as emission taxes, tradable emission allowances, subsidies or performance standards, since these allow firms in pursuit of minimizing the compliance costs to innovate the technological solutions freely themselves (Ambec et al. 2013). These market-based solutions may offer powerful incentives

for firms to adopt environmentally sound processes, since they receive extra benefits for doing so (Jaffe et al. 2002). Strict technology standards, on the other hand, are problematic, since they tend to slow down or halt the development of alternative technologies that might have higher performance potential in the future (Jaffe et al. 2002).

Measurement of competitiveness

Measurement of competitiveness and sustainable competitiveness is of critical importance for two reasons. First, the measurement of the concepts enables the setting of targets and following up on them, making it possible to determine the current or past level of competitiveness, and whether that level has improved or deteriorated. Consequently, it allows comparing the achieved performance level to others, recognizing best practices and benchmarking (Berger 2011). As competitiveness is by its nature a relative concept, it implies the need to compare one's performance to others (Balkytė & Tvaronavičienė 2010). Second, how the concepts are measured is also one way of perceiving them. The variables that constitute the indices and rankings largely determine how competitiveness is perceived as and to what attributes one attempts to influence in pursuit of improved competitiveness and sustainable competitiveness. This is in part the result of significant media attention often given to these types of rankings, though their validity and reliability in steering policymaking is sometimes questioned (Berger 2011). Thus, it is undisputedly important to understand at least on a general level, how these concepts are being measured and what are the variables linked to them.

Over the past decades, a multitude of indices have been constructed aiming to capture competitiveness, sustainability, and more recently both of them combined into sustainable competitiveness. In terms of national competitiveness, WEF measures national competitiveness through Global Competitiveness Index (GCI), and International Institute of Management Development (IMD) utilizes various criteria in its World Competitiveness Yearbook (WCY). In addition, also national productivity, a nation's trade balance, labor productivity, foreign exchange rate, and foreign direct investment (FDI) have been utilized (Bhawsar & Chattopadhyay 2015).

In 2011, WEF began measuring national sustainable competitiveness through the Sustainable Competitiveness Index (SCI). They recognized that the GCI focused on short and medium term drivers of productivity, whereas sustainability requires a long-term approach, as some drivers might have a neutral or positive effect on productivity in the short term, but are not sustainable and might even be detrimental in the long term (WEF 2011). In the SCI, the 12 pillars of the GCI were retained, but organized under five separate subindices: human capital, market conditions, technology and innovation, policy environment and enabling conditions, and the physical environment. New categories for capturing sustainability include social cohesion, environmental policy, resource efficiency, management of renewable resources, and environmental degradation, which are all composed of a variety of individual variables. These include e.g. the stringency and enforcement of environmental regulations, change in forest cover and forest loss, and CO2 intensity. In terms of social sustainability, the SCI includes variables such as access to sanitation, healthcare and drinking water, extent of informal economy, and youth unemployment (WEF 2012).

Another move towards combining the measurement of economic performance and sustainability on a national level was that of the Commission on the Measurement of Economic Performance and Social Progress in 2009 (Stiglitz et al. 2009). They wanted to measure not only economic activity, but also social wellbeing and quality of life as integral parts of sustainable development.

Measures for regional competitiveness have surged since the late 1990s as policy-makers have enthusiastically adopted the concept and aim to devise policies for promoting and enhancing their region's competitiveness to attract new businesses (Berger 2011). Firms use rankings and indices to make investment plans and assess locations for new facilities (Ochel & Röhn 2006). Composite indices, which combine several input, output and outcome variables into a single measure of competitive performance, have been popular in

both national and regional competitiveness measurement. However, their construction is often challenging in terms of variable and model selection, and aggregation into a composite measure. Despite this, until the end of 2009, Berger (2011) found 217 indices related to regional competitiveness, 126 of which he classified as composite indices. Regional measures that are most often utilized include: e.g. the employment/unemployment rate in the region, the quality of labor force, innovation capacity in terms of patents and/or R&D expenditures, quality of educational institutions, and tax burden.

In terms of firm level sustainability, the triple bottom line (TBL) was one of the first attempts to capture the concept (Elkington 1997). TBL aimed at creating a reporting framework for companies to take into account both environmental and social performance, in addition to the traditionally reported financial performance. Especially the measurement of the environmental aspects of sustainability has also seen some progress, as Environmental Performance Index (EPI) and Ecological Footprint have been crafted. A few institutions have also focused on the social aspects, including European Commissions Sustainability Report, the World Bank's Worldwide Governance Indicators, and the International Monetary Fund (IMF)'s Global Financial Stability Report.

Future directions

Competitiveness and sustainable competitiveness are complex and multidimensional concepts. Considering sustainability from both environmental and social perspectives alongside economic considerations seems imperative and urgent, but so far research on the topic is rather scarce. However, as the European Commission's Europe 2020 strategy aiming for smart, sustainable, and inclusive growth (European Commission 2010), and the United Nations' 17 Sustainable Development Goals (SDGs) to end poverty, protect the planet and ensure prosperity for all (UN 2015) quite clearly demonstrate, there is growing concern over the sustainability of our current lifestyle. Aiming to improve competitiveness sustainably at the national, regional and firm levels is thus increasingly important.

Especially at the national and regional levels, new measures and research on the topic could help politicians and leaders make more informed decisions in the pursuit for sustainable competitiveness. Advances in sustainable development research could benefit the construction of even more reliable measures for sustainable competitiveness. Further research on the drivers of and barriers to increased sustainable competitiveness is needed, as identifying these could in addition to benefiting policy-making, also motivate nations, regions and firms globally to pursue it more vigorously.

The role of consumer choices and requirements is pivotal in promoting sustainable competitiveness at each of the three levels. At the national and regional levels, consumers can influence by voting and actively taking part in the formation of policies and regulations, that in turn influence the sustainable competitiveness at each of the levels. Firms and consumers also play a key role, as they have the possibility to encourage sustainable buying behavior and make the pursuit of sustainable competitiveness a truly lucrative one. If customers demand more sustainable products, it will be beneficial for firms to attempt to meet these needs and gain competitive advantage through environmentally and socially concious actions. On the other hand, firms may adapt sustainable choice architectures that encourage consumers towards environmentally sound choices (Thaler & Sunstein 2008).

The characteristics of sustainable development, competitiveness and sustainable competitiveness all require further clarification in order to attain comparable results with comparable measures on which further research can build. New theoretical models describing the relationship between sustainability and competitiveness at each of the levels of analysis is needed.

In all, especially the indices related to competitiveness and sustainable competitiveness at national and regional levels are efficient at steering policymaking and target setting, and thus their importance and influence should not be understated, and they should be taken into account more widely. Further research is needed to

evaluate the validity and robustness of the most common measures, and to construct new and reliable composite measures taking sustainability into account. In the future, evaluating and improving competitiveness should be based on more than economic metrics, as also sustainability and sustainability-related metrics will need to be more comprehensively and commonly considered.

Cross references

Business environment; Corporate social responsibility; economic competitiveness; economic growth; Environmental accounting; Local and Global Environmental Sustainability

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