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The competitiveness of small network-firm: A practical tool<sup>☆</sup>Ángel Díaz-Chao<sup>a</sup>, Jorge Sainz-González<sup>a</sup>, Joan Torrent-Sellens<sup>b,\*</sup><sup>a</sup> Rey Juan Carlos University, Applied Economics Department, Rey Juan Carlos University, Paseo de los Artilleros, s.n., Madrid 28032, Spain<sup>b</sup> Open University of Catalonia and Internet Interdisciplinary Institute, Barcelona 08035, Spain

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## ABSTRACT

This study presents a model and a practical tool for measuring and managing small network-firm competitiveness. This model, which has three concentric circles, goes beyond the value chain. The first concentric circle represents a small network-firm's results. The second represents the four elements of the firm value. The third represents the set of environmental activities affecting the value elements. In addition, ten working assumptions are present. The findings suggest that the small network-firm competitiveness is manageable through a set of twenty-five entrepreneur or indicators that managers perceive; five for each value element (human resources and work organization, operations and marketing, infrastructure, and innovation) and five for small firm performance. A ten-point Likert scale rates each of these indicators. An empirical analysis corroborates the model and the practical tool. This information system could be especially useful to small firms that do not have practical tools for managing better competitiveness in global knowledge environments.

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See Fig. 1

## 1. Competitiveness in the global knowledge economy

Beginning with some pioneering contributions (Krugman, 1994; Porter, 1985, 1990), academic, social, political, and strategic interest in competitiveness is growing remarkably since its creation two decades ago (De Grauwe, 2010; Hughes, 2008). Broadly speaking, this interest owes to three phenomena that are radically transforming the sources of economic and business growth. First, the consolidation of the global knowledge economy. The new landscape determines new sources of economic growth and firm performance such as investment and use of information and communication technologies (ICTs), knowledge and innovation flows, and an interconnected network of economic agents (Antonelli, 2011; Castells, 1996, 2004; Dolfma & Soete, 2006; Foray, 2004). Second, the spread of economic regionalization processes. The construction of regional economic areas has added interest to the traditional concern about convergence and inequality in income and wealth levels (Krugman, Obstfeld, & Melitz, 2011). Third, empirical evidence of the widening gap in per-capita output in major economic

areas of the world is becoming worse during the last economic crisis (Bourlès & Cette, 2007; Siggel, 2007).

In this context, the most recent methodologies approach competitiveness from a broad perspective that goes far beyond the capacity of economies, regions, or firms to penetrate international markets. Competitiveness is the set of institutions, policies, and factors that, in a context of international openness, determine the levels of material prosperity of a country, a region, or a firm (Aiginger, 2006).

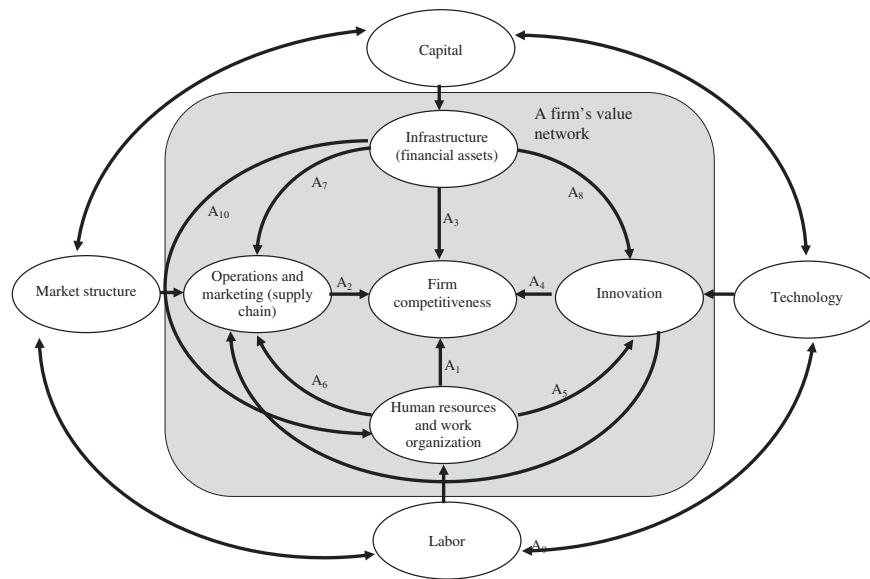
At both national and regional level, the economic, political, and social characteristics of the productive base determine competitiveness (OECD, 2007; Porter, 1998). In particular, by combining advanced and specialized factors, firms can exploit economies of agglomeration (Camagni, 2002; European Commission, 2003; Venables, 2005). Taking into account the ideas of geographic concentration of competing firms in specialized sectors (clusters), and high local production-system interaction with environment-related capital (industrial district), regional science explains the basics of territorial competitiveness (Becattini, 2004; Capello, Camagni, Chizzolini, & Fratesi, 2008; Porter, 2003; Yu, 2011). Specifically, the following are crucial. First, the importance of concentration and interaction among knowledge, inputs, and highly specialized local institutions. Second, the benefits of competition and local demand. Third, the presence of a system of highly specialized small firms, with fast and efficient information systems, high levels of firm and job turnover, and a major flow of direct relations among local actors.

From the firm perspective, the traditional approach to competitiveness—that is, the ability of a firm to expand market share—changes because of the varying nature of efficiency sources and market structure. Firm competitiveness relates to continuous presence in the markets, profit-making, and the ability to adapt production to demand

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Source: Own elaboration.

Fig. 1. Concentric circles model of small network-firm competitiveness Source: Own elaboration.

(Achrol & Kotler, 1999, 2012; Porter, 2004; Porter, Delgado, Ketels, & Stern, 2008).

However, the transition to a global knowledge economy profoundly alters the sources of competitive advantage. At the aggregate level, investment in the use of ICTs together with knowledge and innovation flows and network interconnection explain the progress of labor productivity and the efficiency (total factor productivity) of the whole economic system changing the concept of space: space moves into a cognitive space from a heterogeneous physical one, through the capabilities that economic agents have to share, flows of technology, knowledge, and innovation achieve externalities and increase territorial returns (Camagni & Capello, 2008).

In this context, new contributions following the “competitiveness hat” method are crucial (Capello, 2007; Montfort, 2008). In this approach, the competitiveness of European regions fits into three types of dynamic economies of agglomeration. First, regions as places of production, with a competitive advantage based on the availability and price of the inputs. Second, regions as sources of increasing returns, with a competitive advantage based on the division of labor and market size. Third, regions as knowledge centers, with a competitive advantage based on the quality of human resources, access to international markets, availability of business services, and a region’s attractiveness as a cultural and knowledge center.

Finally, the new sources of competitive advantage relate to the construction of new forms of strategic, organizational, productive, and labor-related practices: the network-firm (Brynjolfsson, Renshaw, & Van Alstyne, 1997; Foss, 2005; Josserand, 2004), which builds on work autonomy, organizational decentralization, and networking between a firm’s internal and external economic agents through intensive ICT use.

Among the features of the network-firm, which combine business and social networking, communication, coordinated ICT use, and high-quality human resources, the following five issues appear. First, the establishment of boundaries between a firm’s internal and external economic agents. Second, flatter structures. Third, guidance for projects. Fourth, direct communication. Fifth, commitment and trust. The interweaving of these five components reinforces the greatest asset of the network firm: its flexibility to adapt to the changing global knowledge environment. That interweaving also minimizes network firms’ main problem: the articulation and coordination of network nodes.

The restructuring of the network-firm may entail an internal or external business change. External dimensions build on networking with other firms to reduce costs, increase specialization, create economies of scale, and permit the dilution of risks. These two dimensions of change, which draw from each other, define a set of six assets that explain the network-firm. First, specialization based on business units, focusing on core value elements for the organization. Second, increasing lateral links between firms, either by purchasing components or services that are part of the final product or by outsourcing. Third, advanced use of technology, especially ICTs, as an essential business activity. Fourth, the growing importance of horizontal communication links and flat rather than vertical hierarchies. Fifth, less dependence on hierarchical authority models and the growing importance of autonomous work teams. Sixth, better-trained workers who assume more responsibilities.

Empirical evidence shows that network-firms consolidate new interrelated sources of competitiveness such as global strategy, the intensive use of ICTs and knowledge streams, innovation, new work organization, and human resource management practices, network operations, and investment in intangibles (Cardona, Kretschmer, & Strobel, 2013; Ficapal-Cusí et al., 2011; Hitt & He, 2008; Mouzas & Ford, 2012). Table 1 summarizes the competitive strengths and value elements in the network-firm.

Specifically, and because of new theoretical and empirical developments (Ketels, 2006), this study proposes a theoretical model of small network-firm competitiveness in global knowledge environments that is measurable through the evaluation of their components that are set in three deep-level concentric circles. The first one represents competitiveness outcome indicators. The second one represents network-firm dimensions and indicators. The third one represents global knowledge environment dimensions and indicators. Through the remaining, the study establishes an in-depth description of each dimension and indicator and their evaluation.

## 2. Representing small network-firm competitiveness: From value chain to value circles

Taking as a model the “competitiveness hat,” which explains regional competitiveness in the European Union (Capello, 2007; Capello et al.,

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