



A novel application of fuzzy-set qualitative comparative analysis to GEM data[☆]



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ABSTRACT

This study constitutes a novel application of fuzzy-set qualitative comparative analysis to Global Entrepreneurship Monitor (GEM) data. This study seeks to demonstrate that fsQCA enriches previous conclusions from linear regression analyses that state that a relationship exists between the GEM's Total Entrepreneurial Activity rate (TEA) and variables representing entrepreneurial attitudes and social values of adult populations toward entrepreneurship. FsQCA allows researchers to estimate which of these attitudes and social values are necessary, sufficient, or both for full membership in the set of most entrepreneurial active countries within the set of GEM innovation-driven countries. FsQCA provides also valuable details that contribute to explain why, although significant, some GEM regression analyses do not usually show a high explanatory capacity. The findings of this study demonstrate that fsQCA widely extends the possibilities of analysis and understanding of the role of GEM indicators. FsQCA allows further research involving other groups of countries, different sets of GEM indicators, and geographical configurations.

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1. Introduction

GEM provides a robust framework within which national governments can develop a set of effective policies to enhance entrepreneurship (Reynolds, Hay, & Camp, 1999). Since 1999, the GEM project fills a significant information gap around entrepreneurship. The ascendance of entrepreneurship in the last decades translates into several major policy initiatives around the world (OECD (Organization for Economic Co-operation and Development), 1998): Public laws and governmental programs for entrepreneurs, educational programs to introduce entrepreneurship at schools and universities, tax benefits for informal investors, improvements on bureaucracy, new capital markets, awards, fairs, and many more. The world needs entrepreneurs (Birch, 1981; Schumpeter, 1934) and, undoubtedly, since the late nineties entrepreneurship is center stage in the public-policy arena of most countries.

GEM has a special interest in ascertaining what makes a country entrepreneurial. Researchers specially focus on studying the role of adult populations' attitudes and social values toward entrepreneurship. Recent reviews on this literature exist such as those of Cacciotti and Hayton (2015) or Stephan, Hart, and Cord-Christian (2015). The GEM research community shows that, in general, entrepreneurial attitudes and values such as capability to identify opportunities, having skills,

knowledge and experience starting up businesses, knowing recent entrepreneurs, not having fear to failure, thinking that entrepreneurship is a good career choice, and successful entrepreneurs get high social status and recognition have a positive effect on the TEA rate.

Many of these previous analyses deal with specific countries using GEM individual data (e.g., Bergmann, 2002 for Germany) whereas others focus on wider geographical regions (e.g., Bosma & Schutjens, 2009 for Europe) using aggregated data. The methodological approach is quantitative in all cases and regression methods are the most habitual. The dependent variable these studies use is the TEA rate (which acts as an indicator of how entrepreneurial the societies are) and the independent variables are those that collect information on entrepreneurial attitudes and values. If the study draws on individual data, these variables are dichotomous, and if the study draws on aggregated data, these variables are quantitative continuous (i.e., percentages of positive presence of different entrepreneurial attitudes, values, and activity in the populations). Other recent studies focus on analyzing particular aspects of entrepreneurship (Lee, Ribeiro, Olson, & Roig, 2007; Ribeiro-Soriano & Castrogiovanni, 2012; Ribeiro-Soriano & Urbano, 2010). Rey-Martí, Tur-Porcar, and Mas-Tur's (2015) crisp-set qualitative comparative analysis (csQCA) on women entrepreneurs' motives (propensity for risk, finding a work–life balance, desire to develop business skills, need to seek self-employment, and desire to earn more than in paid employment) for business survival represents a novel application of csQCA to the entrepreneurship domain.

As GEM research progresses, more evidences appear of the complexity of the entrepreneurial phenomenon. The increasing diffusion of the

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fsQCA method represents a big opportunity for further progress for this scientific community. Sixteen years of quantitative analysis may help to answer the question “what makes a country entrepreneurial?” However, the question “what should we identify as ‘entrepreneurial?’” needs an answer first. That means identifying what threshold value of the TEA rate should suffice to consider one country as part of the set of very entrepreneurial countries at each development stage.

Thus, this research seeks to analyze through fsQCA the causal contribution of entrepreneurial attitudes and populations' values as conditions to achieve the outcome: a certain threshold of entrepreneurial activity rate. The main difference between regression methods and fsQCA is that fsQCA allows the assessment of complex causality (i.e., different combinations that give the same outcome). For GEM this represents the opportunity to identify the populations' different behaviors to achieve certain levels of entrepreneurial activity, which classical regression methods cannot assess. Therefore, this study seeks to present a method able to identify policies and make evidence-based recommendations to increase the level and quality of entrepreneurial activity (Reynolds et al., 1999).

2. The GEM model as theoretical background

The GEM project draws on a theoretical model. Since 1999, this model transforms and improves because of the successive findings of the GEM scientific community (Singer, Amorós, & Moska, 2015). Fig. 1 shows the 2015 version of this theoretical model.

The aim of this research is to analyze whether the individual entrepreneurial attributes and social values toward entrepreneurship determine to some degree the outcome (TEA rate). This study also compares the results and conclusions with those of traditional linear regression models.

The GEM model constitutes an adequate framework for scientists not only examining the relationships between the national economic growth, social development, and entrepreneurial activity but also examining intermediate relationships such as those between social values and attitudes, and entrepreneurial activity. The evolution of this model across time highlights the importance of these intermediate relationships, which justifies this study's aim.

The first GEM model dates from 1999 and provides an adequate framework to give answers regarding the relationship between the national economic growth and the national entrepreneurial activity. This model, in contrast to the conventional model of national economic

growth from the late nineties, assumes that national economic growth is the result of the individuals' (no matter the location or their businesses' dimension) personal ability to identify and seize opportunities; this process takes place in the interaction with the environment (Singer et al., 2015).

For the GEM community, early versions of the initial model are insufficient because they do not deliver explicit information on the nature of the relationship between variables in the Entrepreneurship Profile (i.e., attitudes, aspirations, and activities). However, new findings deriving from the latest studies reveal more details about the nature of these relationships. The opening of this “black box” in the revision of the model (see Fig. 1) results in an increment of research around testing the characteristics of the relationships between social values, personal attributes, and various forms of entrepreneurial activity.

Another important aspect of the GEM's transformation and evolution is the consideration of different types of economies when presenting the results for the main indicators. GEM surveys confirm that the level of entrepreneurial activity varies among countries and that entrepreneurial activity requires consistent policy interventions. Surveys also confirm that entrepreneurial activity in different forms (i.e., nascent, start-up, intrapreneurship), positively correlates with economic growth, but that this relationship differs along phases of economic development (Acs & Amorós, 2008; Van Stel, Carree, & Thurik, 2005; Wennekers, Van Stel, Carree, & Thurik, 2010).

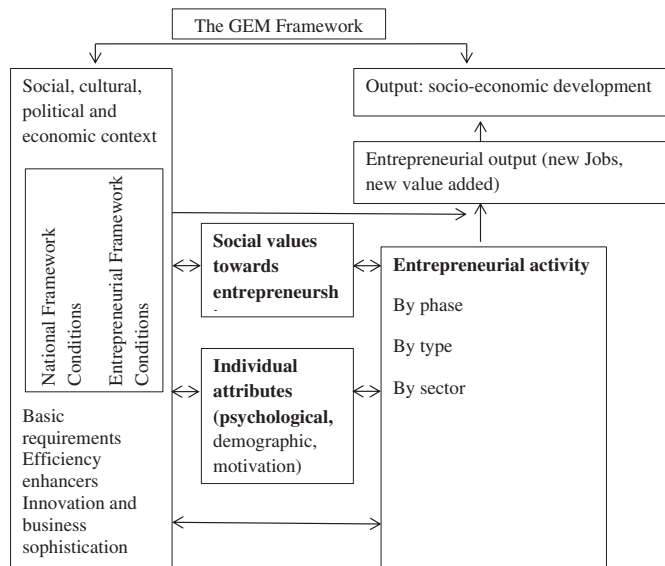
Taking in consideration these theoretical elements, this study focuses on analyzing the necessity and/or sufficiency of the entrepreneurial attitudes and social values to achieve high levels of the output in innovation-driven countries.

Since 2008, GEM follows the World Economic Forum's typology of countries based on Porter, Swab, and Sala-i-Martin's (2004) definitions of economic development levels: factor-driven, efficiency-driven, and innovation-driven countries. The innovation driven countries are those at the top of the Global Competitiveness Report (GCR) rank, that is, the most competitive following the GCR methodology. The adoption of the GCR classification contributes to show how the uniqueness of the GEM adult population survey is complementing other major surveys on new business creation by providing important information on individuals (attributes, values, activities) and their interaction with the environment in practicing entrepreneurial behavior (Bosma, Acs, Autio, Coduras, & Levie, 2009).

Opening the fsQCA door to GEM scientific community expands the current theoretical framework because the fsQCA allows researchers to look for more extensive answers to traditional questions such as “what makes a country entrepreneurial?”, “Why some countries are more entrepreneurial than others?”.

3. Models to test

Fig. 2 presents the models to test. The fsQCA context is different from traditional quantitative approaches, therefore instead of formulating hypotheses and testing them, the aim of this research is to learn what combinations of two groups of conditions give the target outcome.



Source: GEM Global 2015

Fig. 1. The revised GEM conceptual model Source: GEM Global 2015.

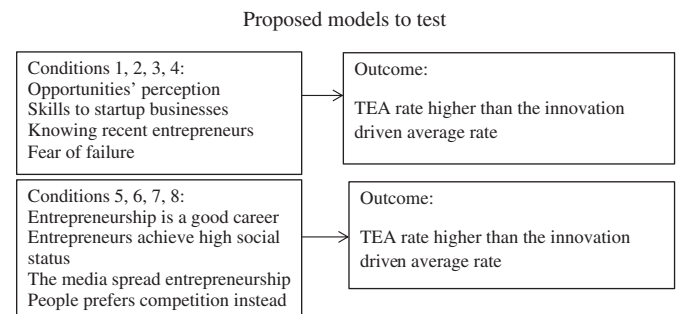


Fig. 2. Proposed models to test.

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