



# How to analyse determinants of entrepreneurship and self-employment at the country level? A methodological contribution

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## ABSTRACT

The aim of the article was to empirically support a hypothesis, that no matter what measure of entrepreneurship or self-employment we choose at the country level, the determinants indicate the same direction of impact. Methodologically, four measures of entrepreneurial and self-employment activity were utilized as dependent variables in regression models. Entrepreneurial activity in the article was operationalized by Eurostat and OECD self-employment rates, and by Global Entrepreneurship Monitor rates of established business ownership rate and total early-stage entrepreneurial activity (TEA). Based on the obtained results, the determinants of entrepreneurship and self-employment influence all four presented measures in the same direction.

## 1. Introduction

Increasing data availability allows us to conduct empirical studies in the field of entrepreneurship more frequently. As Koellinger and Roy Thurik (2012) together with Davidsson and Wiklund (2007) note, there is a large number of published studies with a focus on different levels of analysis, such as micro (firms or companies), meso (regions or industries) and macro (countries or cross-countries). Each of these above-mentioned analyses require, besides a theoretical background, a proper empirical and methodological strategy. Collected empirical evidence, allows us to seek the most suitable solutions, when it comes to the selection of data sources, variables and scientific methods. Such a debate might improve the quality of future studies in the fields of entrepreneurship and self-employment (e. g. Apergis and Payne, 2016; Stenholm et al., 2013; Iversen et al., 2007; Congregado, 2007 or Coviello and Jones, 2004).

Presented study aims to extend the empirical knowledge on the measurement of entrepreneurship at the country level and its determinants. The motivation for conducting this study lies in a large number of recently published studies focused on the cross-country determinants of entrepreneurial activity and self-employment (e. g. Nikolaev et al., 2018; Rusu and Roman, 2017; Roman et al., in press; Dempster and Isaacs, 2017; Dvouletý, 2017a; Nicolae et al., 2017; Canever and Menezes, 2017; Hall et al., 2016; Hoogendoorn et al., 2016; Carbonara et al., 2016, Calá et al., 2015 or Valdez and Richardson, 2013) which are often based on different measures. First, the question is whether the various studies, based on different operationalisations of entrepreneurial activity and self-employment indicate the same impact of the cross-country determinants or not. If the studies, aiming to explore drivers of entrepreneurship and self-employment, deliver contradictory conclusions on the impact of economic and institutional variables, then it is very difficult to form any policy recommendations, i. e. aiming to change the business environment (Szerb et al., 2013;

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Parser, 2009). Second, from an empirical experience (e. g. Baptista and Thurik, 2007 or Grilo and Thurik, 2004) it is well known, that determinants of entrepreneurship and self-employment might change over the time and across regions. Therefore if we want to compare the different measures of entrepreneurship and self-employment methodologically, then we need to work with the same group of countries and follow it for the exact same time period. This kind of empirical exercises, aiming for a harmonization are still very rare in entrepreneurship research, despite the fact that these studies are very important for the whole community.

The debate on the measurement of entrepreneurship and self-employment at the country level is not novel (see e. g. Henrekson and Sanandaji, 2014; Acs et al., 2014; Marcotte, 2013; Rogoff, 2012; Acs et al., 2008, Iversen et al., 2007 or Congregado, 2007), however, this article aims to push this discussion further on, by an empirical assessment of the differences across various indicators on an example of a harmonized sample. Particularly, the article exploits a dataset of eleven countries over the period 2001–2015. Methodologically, four measures of entrepreneurial and self-employment activity are utilized as dependent variables, and for each of the dependent variables, a comparative regression model is estimated with a set of country-level determinants. Entrepreneurial activity in the article is operationalized by Eurostat (2017) self-employment rate, OECD (2017) self-employment rate, and by Global Entrepreneurship Monitor (2017) rates of established business ownership rate and total early-stage entrepreneurial activity (TEA). The main aim of the article is to empirically support a hypothesis, *that no matter what measure of entrepreneurship or self-employment we choose at the country level, the determinants indicate the same direction of impact*, because the country-level determinants affect the most of entrepreneurs and self-employed individuals in the economy.

The structure of the article is conventional. The following part is dedicated to the discussion on the measuring country level of entrepreneurship and self-employment. Section three introduces the collected dataset and variables, and it presents the empirical strategy and obtained econometric estimates. The final section concludes the article and it suggests avenues for future research.

## 2. Measuring entrepreneurship and self-employment rates at the country level

According to Marcotte (2013), Acs et al. (2008), Iversen et al. (2007) and Congregado (2007), the measurement of entrepreneurial and self-employment activity at the country and cross-country levels is still an under-represented area of research, despite the need to have reliable data for conducting empirical studies. Empirical scholars operationalize entrepreneurship/self-employment differently. According to Stenholm et al. (2013) there two approaches how to measure country level of entrepreneurial activity. The first one relies on self-reports of randomly selected individuals (surveys) and the second one is based on the records obtained from national business registries. Iversen et al. (2007) have tried to compare the historical perception of entrepreneur with the particular measures of entrepreneurship and self-employment in the economy. A very comprehensive overview of existing measures was recently written by Marcotte (2013).

One common approach is to express entrepreneurial and self-employment activity as a ratio of the population of registered businesses/number of self-employed (e. g. Koellinger and Roy Thurik, 2012 or Dvouletý and Mareš, 2016a, 2016b). Frequently is also used the variable, representing the rate of newly established/registered enterprises (e. g. Dempster and Isaacs, 2017; Dvouletý, 2017b; Nicolae et al., 2017; Carbonara et al., 2016 or Fritsch et al., 2015). Nevertheless, Congregado (2007) together with Van Stel (2005) argue, that methodology of national statistical offices differ, and therefore it is better to use adjusted harmonized data for instance from Eurostat or OECD databases. Inspired by this idea, Van Stel (2005), with his colleagues created EIM Compendia database, where they adjusted and harmonized American and European data obtained from OECD. Unfortunately, this dataset is limited by available years and countries (e. g. Hoogendoorn et al., 2016). Other scholars (e. g. Lado-Sestayo et al., 2017; Ferreira et al., 2017; Acs et al., 2008, Reynolds et al., 2005 or Sternberg and Wennekers, 2005) work with the data obtained from the Global Entrepreneurship Monitor surveys, particularly with the rates of established business ownership rate, total early-stage entrepreneurial activity (TEA), high-growth activity or TEA innovation activity. Additionally, Kaufman index of entrepreneurial activity for the US should be mentioned (Hafer, 2013).

Another approach, how to solve, this measurement issue, is to work with more complex indices aiming to capture the whole entrepreneurial ecosystem, such as Global Entrepreneurship Index, former Global Entrepreneurship and Development Index<sup>1</sup> (Acs and Szerb, 2009; Acs et al., 2014).

At the same time, we need to mention the fact, that there are indicators measuring “general level of entrepreneurship and self-employment” (overall rates) and those, aiming to monitor just the “specific rates” (e. g. high-growth enterprises, necessity/opportunity driven entrepreneurship). However, from the economic and institutionalist's perspective, the macroeconomic environment influence the most of the entities present in the economy (e. g. Davidsson and Wiklund, 2007, Van Metre and Hall, 2011 or Chauhan and Das, 2017).

However, the variety of utilized indicators does not reflect their comparability in empirical practice. Generally, a little is known about the differences in various measures of activity and correlations between them. Marcotte (2013) was one of the first scholars who employed bivariate correlation analysis and compared different measures of entrepreneurial activity. She has found highly positive and significant correlations between registered business activity (obtained from World Bank) and data from Global Entrepreneurship Monitor. Her observation was later supported by Henrekson and Sanandaji (2014). Nevertheless, Marcotte (2013) admits, that robustness of her findings is limited by the sample size and she encourages other scholars to validate her results when more observations are available. Presented studies were limited by period till 2010. Positive correlations between different “stock

<sup>1</sup> Please note that the data from Global Entrepreneurship Index are available for period of years 2006–2018, for details see Acs et al. (2017) and for the most recent data see Global Entrepreneurship Index (2018) on the following link: <https://thegedi.org/2018-global-entrepreneurship-index-2/>.

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