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Aim of the study

Recent economic developments, especially during the financial crisis, have led to the discussion on the quality instead of the quantity of entrepreneurship. Innovation plays an important role in entrepreneurial quality, not in the least within the vast and growing group of solo self-employed (SSE) (Rapelli 2012). Creating knowledge and also exploiting it are important features of the entrepreneurial economy. It is driven by innovative activity and knowledge spillovers form an important source of this activity (Audretsch 1995). Spatial proximity is considered to be influential in exploiting the opportunities of knowledge spillovers (Keizer et al. 2002; Audretsch and Lehmann 2005; Audretsch and Keilbach 2006). To an increasing extent we see the development of new innovations via networks of individuals (e.g. through open source software and open design projects) (Von Hippel 2007). These networks are to some extent spatially organized and thrive on spatial externalities for the creation and exchange of ideas. Against this background it is relevant to investigate what role SSE play in innovation processes. However, little attention has been paid to the way that innovation is achieved by this group of entrepreneurs. In this study, we investigate to what extent the individual as well as regional context determines the innovative behavior of the SSE.

Antecedents of innovative self-employment

In the last couple of decades most modern economies have developed from a managed economy to a more entrepreneurial economy (Thurik 2011; Audretsch, Thurik and Stam 2011). This development was reflected by increased small scale entrepreneurial activity (Birch 1987; Brock and Evans 1989; Acs and Audretsch 1993) and also by more knowledge-based activities (Thurik 2011). Along with this shift there has been a rise of self-employment and in particular of solo-self-employment (SSE) (Luber and Leicht 2000). The question whether these SSE have sufficient entrepreneurial quality and are able to display innovative behavior is understudied. It is unclear what factors influence this behavior or whether they develop alternative innovation routes like for instance (open) innovation networks of SSE. Building on a theoretical framework proposed by Romeró and Martínez-Román (2012) we are able to address this problem. The framework distinguishes between individual level and external environment factors that can influence innovative behavior.

This paper contributes to the literature in several ways. First and foremost, this is to our knowledge the first study that empirically examines the innovative behavior of the vast and growing population of solo self-employed. The innovative behavior of this group is often assumed to be different from other SMEs (Bögenhold, Heinonen and Akola 2013) but scholarly evidence is lacking. Second this study contributes to our knowledge on the role of spatial externalities in fostering innovative behavior. We postulate that solo self-employed in particular are more inclined to make use of spatial externalities to innovate. We further elaborate the research model presented by Romeró and Martínez-Roman (2011), and the contribution of this study will go beyond that. As proposed by these authors we present a more thorough analysis on the territorial influence on innovative activities by utilizing a larger data base, covering more geographical depth in our analysis and incorporating better operationalizations of spatial externalities.

Methodology and data

Using a unique and rich data base of solo self-employed in the Netherlands we investigate the determinants of innovative behavior of the solo self-employed. The data base is constructed from an annual survey and data collection was conducted via telephonic interviews. It is representative for the Dutch population of solo self-employed by means of a stratified sample with quotas for sector and legal form. Our effective sample consists of 1.400 observations.

We estimate pooled logit regression models (with clustered standard errors for NUTS 2 regions: Dutch provinces) where the probability of innovative behavior is explained by personal, organizational and environmental characteristics. Innovative behavior is determined by several dichotomous innovation variables identical to the Community Innovation Survey (CIS). These variables include (radical) product innovation and (radical) process innovation in the previous three years. Spatial externalities are approximately measured by the factors in the external environment of SSE firms. They are included in the models (on the NUTS 2-level) by means of the level urbanization, the share of self-employed in the working population, regional income levels, and regional/ firm level R&D expenditures. We also estimate a logit model to explain the probability of innovative cooperation by SSE.

Results and conclusions

Our findings are as follows. First, in line with previous results we find that personal characteristics, like the level of education and job growth ambitions, are important determinants of innovative behavior. Secondly, organizational characteristics are also important. For instance utilizing networks for knowledge transfers, the innovative cooperation with other organizations and the business type of SSE are important factors for product innovation. Cooperation with other SSE is negatively associated with innovative behavior and innovative cooperation. Third, we find that spatial externalities, like knowledge spillovers, networking and spatial proximity are associated with process innovation but not with product innovation. Solo self-employed in regions with higher levels of self-employed income are more inclined to engage in process innovation than regions with lower income levels. SSE are also more nudged to engage in process innovation if the regional level of R&D expenditures by firms is higher. Finally, there is a strong negative impact of the regional share of self-employed in the working population on the probability to engage in innovative cooperation with other organizations. Along with the result that cooperation with other SSE is negatively associated with innovative behavior we conclude that networks of SSE do not (yet) form a determinant for innovative SSE behavior.

Policy implications

Our findings help shed light on the issue of more and better entrepreneurship. Not just the quantity, but rather the quality of self-employment matters. For policy to induce more innovative entrepreneurship, even among the smallest firms like solo self-employed, it should be directed to the individual level and /or the business environment. R&D expenditures other than expenditures by firms do not positively influence. Finally It would be less effective to directly stimulate networking behavior by SSE in order to invoke their innovative behavior.