

Innovative Technology-Based Entrepreneurs: Does Clean-Tech make a difference?

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Sustainable development has emerged as an influential, although controversial, concept for both business and policy, and there is rising recognition that a major transformation is needed to reduce detrimental environmental and societal impacts created by our presently unsustainable practices (Hall et al., 2010). Innovation is a driver of that transformation is innovation and, in this context, entrepreneurship is increasingly being recognized as a significant conduit for sustainable innovation and an enabler of transformation to sustainable products and processes (Cohen & Winn, 2007; Dean & McMullen, 2007). Moreover, entrepreneurship is being advocated as the solution for many social and environmental concerns (Brown, 2006; Vaitheeswaran, 2003). However, despite the potential entrepreneurship has for fostering sustainable development, substantial uncertainty remains concerning the nature of entrepreneurship's role in the area, which is also reflected in the sparse literature and insufficient academic discourse on the topic (Larson, 2000).

In order to tap some of these knowledge gaps, a necessary condition is a better understanding of the degree to which established theories and evidence on entrepreneurship are still valid when addressing clean-tech entrepreneurship. To this purpose, some caution would arise from the confirmation of the hypothesis that environmentally-oriented (or in other words, clean-tech) entrepreneurs differ on a number of levels in their innovative dynamics and performance from general entrepreneurs (Choi & Gray, 2008; Larson, 2000). This paper intends to do just that, as it executes an empirical analysis of the personal characteristics of Italian high-tech entrepreneurs. We analyze differences in the characteristics of founders according to the sector of operation of the start-up. In particular, we investigate whether entrepreneurs in clean-tech related activities differ from those operating in other industries. As this is an exploratory study, the choice of a dataset that is limited to one country is justified. For this purpose, we deploy already existing RITA (Research on Entrepreneurship in Advanced Technology) dataset, established at Politecnico di Milano in several waves, starting from 2000 till 2010. RITA aims at extending the knowledge of Italian new technology-based firms (NTBFs), by monitoring new start-ups, their structural characteristics and post-entry performances in terms of innovation and growth. The firms are established in 1983 or later, independent at start-up time, operating in a number of high-tech industries, in manufacturing and services (aerospace robotics and automation, ICT manufacturing, medical and electronic instruments, biotechnology, chemical, pharmaceutical and new materials, equipment and components for energy production, multimedia content, Internet and telecommunication services, software, environmental services, R&D and engineering services).

The entrepreneurs who are doing clean-tech innovation may appear to be different in manifold characteristics. RITA allows us to analyze the role of age, gender, type and years of education, length and type of previous working experience, and region (province) of activity. The overall sample is composed of 1,863 firms and more than 5000 of their founders. Our focal subsample consists of firms being active only in the clean-tech industries, namely industries related

to environmental services, sectors components and equipment for renewable energy and renewable energy production. The total number of firms in this subsample is 72, with more than 200 corresponding entrepreneurs. Smaller sectoral subsamples can be extracted as well for control purposes (e.g. biotech or ICT entrepreneurs).

From the methodological standpoint, we use cluster analysis procedure. It classifies a sample of entities (individuals or objects) into a smaller number of mutually exclusive subgroups based on the similarities among the entities (Ketchen Jr. & Shook, 1996). In order to be as generic as possible, we believe that the two step cluster analysis procedure is the most suitable, since it is an exploratory tool designed to reveal natural groupings within a dataset that would otherwise not be apparent (Forza, 2002). By this, we evade being suggestive and allow for the algorithm to reveal the cluster itself. Moreover, the two step cluster method is suitable also for its capability to handle relatively large datasets containing both continuous and categorical variables, which is the case in this analysis.

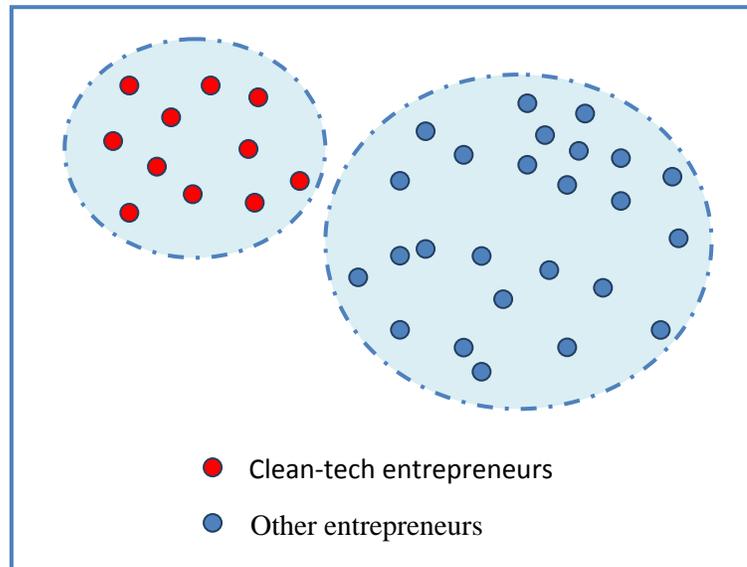


Figure 1 Cluster analysis showcase of the preliminary results

The preliminary results (Figure 1) show the clustering of the entrepreneurs being active in the industries here defined as clean, and seem to confirm the hypothesis that peculiarities exist. This is a promising outcome that opens up a new stream of research. The subsequent aim will be to provide answer on how exactly clean-tech entrepreneurs differ (i.e. individual characteristics that distinguish them from other entrepreneurs). In addition we are interested in disentangling some peculiarities that the process of the so-called clean innovation possesses (similar to (Westhead et al., 2005)). This will be succeeded by exploration of the driving forces and motivations to start a sustainable-oriented venture, relating to the characteristics of start-up founder, but to the conditions surrounding them as well (Shane et al., 2003). Geographical heterogeneity is indubitably present here and should be taken into account. Additionally, more attention should be given to the causes and roots of the motivation (Bilodeau & Slivinski, 1998). If individual-level peculiarities will be confirmed to be at the origin of clean enterprises, some caution should be exerted in adopting the received predictions on entrepreneurship determinants. Specific context dimensions, such as for instance environmental policies or social norms related to the value of environment, will also have to be included in the conceptual framework

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