

Technology as a Resource in Social Entrepreneurship: Applying Resource Dependence Theory

Authors: Concepción Galdón & Juan Manuel Ramírez-Cendrero

Abstract

Social entrepreneurship has become a well-established tool to implement solutions for prevalent social and environmental problems. At the same time, the unprecedented technological progress we are experiencing is an invaluable ally in confronting prevalent issues faced by humanity. While innovation and technology are essential to any organization, its potential impact on those with a social mission is especially significant. Thus, the reflection on the role that technology plays in social enterprises is timely. Although research in social entrepreneurship has made significant advances in the last years, we still lack a theoretical framework that might help us understand the role of technology in social entrepreneurship (Desa y Kotha 2006).

This paper proposes Resource Dependence Theory (RDT) as a framework that can explain the role of technology in social entrepreneurship. If RDT is a powerful explanatory framework to understand the role of technology in social enterprises, then we should observe effects of the use of new technologies in social enterprises consistent with those that RDT predicts. In order to test this hypothesis, we will analyze the relationship between the use of new technologies as a resource and social entrepreneurship in the European Union, specifically in terms of the defining characteristics of a social enterprise: social mission, innovation and market revenues. We apply a multiple linear regression model to the data of the Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship. By empirically confirming the

hypotheses derived from the application of RDT, we conclude that RDT is a valid and valuable framework in the analysis of the role of technology in social entrepreneurship.

INTRODUCTION

Social entrepreneurship has become a well-established tool to confront prevalent social and environmental problems (Bacq and Janssen, 2011, Weerawardena and Mort, 2006, Nicholls, 2006, Defourny and Nyssens, 2010, Hoogendoorn, 2010). The number of researchers working on advancing our understanding of social entrepreneurship has grown over the years, turning social entrepreneurship into a relevant research area (Zeyen et al., 2013, Short et al., 2009, Dacin et al., 2010, Austin et al., 2006b, Defourny and Nyssens, 2012). Researchers have devoted much effort to understanding how social entrepreneurship emerges, the qualities of social entrepreneurs, what institutional environments might be more nourishing for them or how they fund their operations (Seelos and Mair, 2005, Waddock and Post, 1991, Borzaga et al., 2008, Cuervo, 2005, Emerson, 2006, Hoogendoorn, 2010, Alvord et al., 2004).

Thanks to such research efforts we know that social entrepreneurship can generate positive changes at scale (Martin and Osberg, 2007), and it is precisely this potential what makes of social entrepreneurship the relevant research topic it is today. This pursuit of impact in complex contexts with scarce resources makes of technology a specially relevant ally for social enterprises (Byers et al., 2011, Brilliant, 2013). In the face of the fourth industrial revolution, having the theoretical tools to understand and predict the impact of specific technologies is especially relevant for social entrepreneurs (Morrar et al., 2017).

Technology has been established, together with science and knowledge, as one of the critical resources entrepreneurs need to mobilize (Hitt et al., 2002). However, the technology and innovation literature has paid limited attention to its application to social mission-driven organizations (Desa and Kotha, 2006, Brilliant, 2013, Bach and Stark, 2002). Social enterprises use new technologies in different moments and processes that are paramount for achieving their social mission

(Morales-Gutiérrez et al., 2012, Pearce et al., 2019, Chou, 2018). Consequentially, technology has already been identified as a relevant topic that can advance our understanding of social entrepreneurship (Short et al., 2009)

In the case of social enterprises, the capacity to mobilize resources, technology among them, tends to be even more critical than in conventional companies (Austin et al., 2006b, Desa and Basu, 2013, MacMillan et al., 2005). Due to their nature, social enterprises face specific limitations (price, access to talent, access to funding) that make their dependence on the environment for the mobilization of resources necessary to reach their goals higher than that of other ventures (Austin et al., 2006b, Desa and Basu, 2013, Borch et al., 2008, Gardin, 2006, Peredo and Chrisman, 2006). The researchers who have analyzed the relationship between social entrepreneurs and resources available to them have focused mostly in financial resources (Austin et al., 2006b, Miller and Wesley li, 2010) and, to a lesser extent, human resources (Akingbola, 2006, Austin et al., 2006a). We still lack a theoretical framework that might help us understand the role of technology in social entrepreneurship (Desa and Kotha, 2006).

This paper explores Resource Dependence Theory as a potentially useful framework that can explain the role of new technologies in social entrepreneurship and can help us advance our understanding of social entrepreneurship. In order to test this theoretical framework, we will apply it to the case of new technologies as a resource in social entrepreneurship in the context of the European Union at the beginning of the XXI century, when Information and Communication Technologies (ICT) use exploded in the continent. If Resource Dependence Theory is a useful explanatory framework to understand the role of technology in social enterprises, then we should observe effects of the use of new technologies in social enterprises consistent with those that Resource Dependence Theory predicts. We start from the hypothesis that new technologies do improve the independence of social enterprises from their environment and therefore positively affect the three fundamental elements of social

entrepreneurship: the social mission, innovation and market logic (Mair and Marti, 2006). In order to test our hypothesis, we will apply a multiple linear regression model to the data of the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship*.

Although research in social entrepreneurship has made significant advances in the last years, we still lack more theory to help us understand the phenomenon (Weerawardena y Mort, 2006, Short et al., 2009; Zeyen et al., 2013) and most of the contributions are qualitative (Bacq y Janssen, 2011; Jones, Latham y Betta, 2008; Mair y Marti, 2009; Mair y Schoen, 2007; Short et al., 2009). Overall, social entrepreneurship as a research topic has not reached the maturity of other areas (Dees y Anderson, 2006; Dorado, 2006; Hoogendoorn, 2010; Short et al., 2009). This paper builds on previous research to contribute to the social entrepreneurship literature by validating the explanatory power of a theoretical framework that is well established in other areas to explain the relationship between technology and social entrepreneurship. Also, it adds to our empirical knowledge of the social entrepreneurship phenomenon and our knowledge of the role of new technologies in social entrepreneurship.

The paper begins with a literature review. We start by presenting the definition of social entrepreneurship to be used in the paper and review the literature on technology in social entrepreneurship. Later, we present Resource Dependence Theory as a theoretical framework and review the literature analyzing the use of resources in social entrepreneurship. Following the literature review, we set forth the central hypothesis this paper will test. Once the literature review, theoretical framework, and central hypothesis are discussed, the next section presents the methodology used, including a discussion on the adequacy of the database and how the main variables have been built. Results of the quantitative analysis follow and are later discussed, together with possibilities for further research. The paper finishes with the conclusions section.

I. LITERATURE REVIEW AND THEORETICAL BACKGROUND

Social Entrepreneurship: The Quest for a Definition

Since the term started to be used, in the decade of 1980, social entrepreneurship has become a well-established tool to design and implement solutions for prevalent social and environmental problems (Seelos and Mair, 2005, Santos, 2012, Welsh, 2012). Globally renowned organizations such as Ashoka, Schwab Foundation or Skoll Foundation have contributed to increasing the relevance of the concept and countries such as France, United Kingdom, Italy, Finland or Poland have adapted their laws and institutions to promote the emergence and development of social enterprises (Defourny and Nyssens, 2010).

Nowadays, the words “social entrepreneurship” are broadly used. However, different people give different meanings to them (Hoogendoorn, 2010). This has become problematic from an academic perspective as there is still no consensus among researchers concerning what specific concept is represented by the tag “social entrepreneurship” (Short et al., 2009, Seanor and Meaton, 2007). Social entrepreneurship is an area that has been lead by practitioners, and academia has followed in their interest in researching the topic (Roberts and Woods, 2005). This evolution is similar to the one experienced by the academic area of entrepreneurship (Hoogendoorn, 2010, Bacq and Janssen, 2011, Shane and Venkataraman, 2000).

In fact, social entrepreneurship is a subcategory of the broader concept “entrepreneurship” (Bacq and Janssen, 2011, Austin et al., 2006b, Roberts and Woods, 2005, Dees, 1998a, Dees, 1998b). However, the specific frontier of social entrepreneurship within entrepreneurship is not obvious or strict. Rather, entrepreneurship can be conceptualized as a continuum from strictly social to strictly commercial (Borzaga et al., 2008). The main difference among social entrepreneurs and other entrepreneurs is that social entrepreneurs’ main motivation is a social mission, while other entrepreneurs are mostly motivated by profit (Thompson, 2008,

Austin et al., 2006b, Nicholls, 2006). As regular entrepreneurs incorporate environmental considerations or get involved in social activities, the distinction between them and social entrepreneurs is less evident (Roberts and Woods, 2005).

Researchers interested in the study of social entrepreneurship have devoted much effort to define it (Mair and Martí, 2006, Dees, 1998b, Martin and Osberg, 2007, Austin et al., 2006b, Zahra et al., 2009, Bacq and Janssen, 2011). Overcoming the definition challenge is critical to ensure scientific rigor in this discipline (Mair et al., 2006, Roberts and Woods, 2005). Already in 1998, Dees noted that the lack of a standard definition was limiting the development of this academic area (Dees, 1998b). More than ten years later, Dacin et al. (2010) identified 37 different definitions of social entrepreneurship. The discussion led Choi and Majumdar (2013) to declare that agreeing on one unified definition of social entrepreneurship is intrinsically impossible.

The different historic traditions in which social entrepreneurship evolved in each of the two geographic regions that have mostly led the debate, USA and Europe, partly explain the difficulty in agreeing on one definition (Hoogendoorn, 2010, Defourny and Nyssens, 2012, Bacq and Janssen, 2011, Defourny and Nyssens, 2010, Kerlin, 2006, Galera and Borzaga, 2009, Nicholls, 2006, Weerawardena and Mort, 2006). In Europe, social entrepreneurship initially emerged independently from other geographic regions, linked to the third sector and focused on job creation. Since the beginning of the XXI century, social entrepreneurship in Europe received strong influence from USA, incorporating the notion of market logic and being applied to various other spaces, not solely job creation or third sector (Bacq and Janssen, 2011, Kerlin, 2006, Defourny and Nyssens, 2010, Nyssens, 2007, Defourny and Nyssens, 2012).

Researchers have advocated for a broad definition that includes most phenomena we refer to when we use the term social entrepreneurship (Cho, 2006, Short et al., 2009). Consistent with this claim, Lepoutre et al. (2013), reviewed and

analyzed all pre-existing definitions of social entrepreneurship and identified three main criteria that characterize this concept in the literature:

“Social enterprises must have an explicit and intrinsic social goal” (Lepoutre et al., 2013).

“The mission of the social entrepreneur is achieved through an innovative product or service” (Lepoutre et al., 2013)

“For several researchers, the fact that it is called entrepreneurship involves that the social entrepreneur must be exposed to the market logic” (Lepoutre et al., 2013)

According to their analysis, in its broader definition, the social mission is the main differential characteristic of social entrepreneurship. For some researchers, social entrepreneurship is at the intersection among social mission and innovation (Borins, 2000). For others, the two main characteristics that define a social enterprise are social mission and market generated revenue (Nicholls, 2006). The narrower definitions would require all three criteria.

This paper follows the definition developed by Lepoutre et al (2013). Building on their work allows for a systematic definition of social entrepreneurship that is consistent with the database on which the quantitative analysis is done. In addition, Lepoutre et al. (2013) worked on their definitions with two main goals that this paper shares: Firstly, to allow for quantitative empirical analysis and secondly, to offer a holistic definition of social entrepreneurship, that integrates the different visions of the concept that coexist in the literature. Using the three abovementioned elements as building blocks, namely social mission, innovation and market logic, Lepoutre et al. (2013) begin with a broad definition of social entrepreneurship, taken from Mair et al. (2006), for whom the main differential characteristic of a social enterprise is the social mission. Later, they determine the following categories: NGO, hybrid social enterprise, for-profit social enterprise. Consistent with the literature, we will analyze social entrepreneurship starting from the general definition and do a more granular analysis of the different

categories. A more detailed description of how this definition is used to build the main variables of analysis is offered in the Methodology section of the paper.

Technology as a Critical Resource in Social Entrepreneurship

Applying Resource Dependence Theory, this paper analyses the use of new technologies by social enterprises as a relevant component of the set of resources at their disposal. This section develops the conceptualization of new technologies, as used hereafter. Already Schumpeter, at the beginning of the XX century, defined the entrepreneur as an innovator (Schumpeter, 1934). Since, other authors have established a direct connection among technological innovation in a company and its performance (Wong et al., 2005, Rosenberg, 1982). Moreover, technology has been established, together with science and knowledge, as one of the critical resources entrepreneurs need to mobilize (Hitt et al., 2002).

Unfortunately, in the face of the most accelerated technological innovation period experienced by humankind, the latest advancements do not always reach social mission-driven organizations as fast as other organizations. However, the technology and innovation literature has paid limited attention to this phenomenon (Desa and Kotha, 2006, Brilliant, 2013, Bach and Stark, 2002). Desa and Kotha (2006) explain that this analysis is important as "(a) social enterprises increasingly develop and use technology to solve critical social problems; (b) technological-innovation frameworks developed for 'for-profit' ventures may not be readily applicable to the SE context." It would be incorrect to make a simple, direct application to the case of social enterprises of the research on entrepreneurship and its relationship with new technologies. It is necessary, based on the corpus of existing literature, to validate in what cases and in what way the existing literature on technology-innovation and entrepreneurship may be applicable or not to social entrepreneurship and extend the learning of such literature to the characteristics of social enterprises.

Research on technology applied to social entrepreneurship seems to indicate that technology is a critical resource for social entrepreneurs. Social enterprises use new technologies in different moments and processes that are paramount for achieving their social mission (Morales-Gutiérrez et al., 2012, Pearce et al., 2019, Chou, 2018). The Internet allows them to communicate their positive impact and improves their access to funding (Austin et al., 2006b, VanSandt et al., 2009, Calic and Mosakowski, 2016). Moreover, access to technology is a critical factor in the emergence of social enterprises and has allowed for the expansion of this phenomenon (Barendsen and Gardner, 2004, Zahra et al., 2008, van Putten li and Green, 2010, Morales-Gutiérrez et al., 2012, Surie, 2017, García-Morales et al., 2019). In addition, technology makes it possible to open untapped markets, making better services available to underserved populations in impoverished environments (Zahra et al., 2008, Carraher et al., 2016). Finally, new technologies have enabled the creation of new business models for social enterprises (Roh, 2016). Thus, the role of new technologies is an important research topic for us to have a holistic understanding of social entrepreneurship (Short et al., 2009).

The concept of technology is diverse and complex (Rosenberg, 1976) and has been used to refer to various realities: objects, processes, methods, systems (Kline, 1985) and classified in diverse taxonomies. For example, Cimoli and Dosi (1995) identify two critical concepts, technological paradigms, and technological trajectories. In addition, there is a whole body of literature analyzing General Purpose Technologies vs. Specific Purpose Technologies (Harada, 2010, Aghion and Howitt, 2009, Helpman and Trajtenberg, 1996, Basu and Fernald, 2007). Moreover, some authors suggest that a more holistic definition might be more useful as a tool for analysis (Orlikowski, 1992, Gardner, 1990, Christensen, 2013). Consistent with this recommendation, in this paper we use Christensen's definition:

Technology [...] means the processes by which an organization transforms labor, capital, materials, and information into products and services of greater value. All firms have technologies. [...] This concept of technology, therefore, extends beyond engineering and manufacturing to encompass a range of marketing, investment, and managerial processes. Innovation refers to a change in one of these technologies. (Christensen, 2013)

Christensen's definition helps conceptualize technology from a theoretical standpoint but insufficient to operate it from an empirical perspective. Technology thus explained, is present in all social enterprises and, consequentially, it would be impossible to analyze if its presence plays an important role via quantitative indicators that need to compare different states of a variable. Starting from this broad definition, we can run a quantitative analysis by considering the novelty of the technology as an indicator of technological innovation. Technological innovation, thus defined, is perfectly captured by Terjesen (2009) in *Global Entrepreneurship Monitor 2009 Report on Social Entrepreneurship*: "The technologies or procedures needed for this product or service are available since less than one year ago, between one and five years ago or more than five years ago?"

In summary, we have chosen to use a definition of technology that is consistent with the literature and allows us to empirically analyze the effect of the use of new technologies by social entrepreneurs as a resource, thus testing the explanatory power of Resource Dependence Theory in this space. We define technology as "*processes by which an organization transforms labor, capital, materials, and information into products and services of greater value*" (Christensen, 2013). We define new technologies as technologies available more recently and technological innovation as the evolution or change of technology to new technologies (Christensen, 2013).

Theoretical Framework: Resource Dependence Theory in Social Entrepreneurship

This paper proposes Resource Dependence Theory as a framework that can explain the role of technology in social entrepreneurship. If Resource Dependence Theory is a useful explanatory framework to understand the role of technology in social enterprises, then we should observe effects of the use of new technologies in social enterprises consistent with those that Resource Dependence Theory predicts. Formulated for the first time by Salancik and Pfeffer in 1978, Resource Dependence Theory is a well-established theoretical framework that has helped advance our understanding of corporations big and small. Resource Dependence Theory points out that all organizations are open systems in a relationship of interdependence with respect to each other and the environment around them. For Salancik and Pfeffer (1978, p.40) "interdependence is the reason why nothing happens exactly as one expects." Interdependence, as described by Salancik and Pfeffer, does not refer to the cause-effect relationship between the agent seeking a result and the result itself. It refers to the relationship between different agents, mediated by the existence in the environment of resources they need, and how this affects the results that each one can achieve. Interdependence, thus defined, is important for organizations because it impacts the ability any organization has to achieve its goals.

According to the authors, the most relevant factor generating interdependence is the relationship between the resources available in the environment and the demand for them from various agents. When available resources are scarce, and the number of agents demanding them is high, interdependence among agents who need the same resource is greater. In this context, resources are all elements necessary to achieve the organizations' goals: production factors, such as capital and labor, or other elements such as contacts or the number of potential clients in a market. Each resource, depending on its characteristics, can be an advantage or a disadvantage in achieving an organization's goals. Salancik and Pfeffer (1978) identify three factors

that determine the level of interdependence generated by a resource: 1. Quantity and relevance, 2. discretion over use, and 3. concentration on few agents.

Resource Dependence Theory is an influential theoretical framework for researchers in strategic management and organizational behavior (Hillman et al., 2009). It was soon also applied in the study of new ventures (Hillman et al., 2009, Baker and Nelson, 2005, Newbert and Tornikoski, 2013, Villanueva et al., 2012, Ucbasaran et al., 2001), where its explanatory potential is greater than in the case of more consolidated businesses (Daily, 2002). Indeed, the munificence of resources in the environment has been established in the literature as a critical determinant of new venture creation (Cuervo, 2005).

In the case of social enterprises, the capacity to mobilize resources tends to be even more important than in conventional companies (Austin et al., 2006b, Desa and Basu, 2013, MacMillan et al., 2005). Social enterprises operate in especially complicated and unstable environments (Desa, 2012, Zahra et al., 2008) in which it is not usual to find a high concentration of resources (Zahra et al., 2000). The real ability of the organization to gather the resources necessary to carry out its activities and achieve its social mission is critical (Borch et al., 2008, Gardin, 2006, Peredo and Chrisman, 2006, Reis and Clohesy, 1999).

While for most entrepreneurs finding a business opportunity worth exploiting is one of the main obstacles to overcome, social entrepreneurs find a wealth of social needs that need to be addressed (Austin et al., 2006b). However, they confront a massive disproportion between the immense number of opportunities they could focus on, trying to reach the highest possible number of users/clients, and the scarcity of resources available (Desa and Basu, 2013, Austin et al., 2006b). Seelos and Mair (2005) state that social entrepreneurship "depends on individuals exceptionally capable of gathering and mobilizing resources." According to the literature, some of the characteristics of social enterprises that makes them more dependent on their environment with respect to access to resources than other new ventures are

limitations in their ability to transfer costs to price (Lasprogata and Cotten, 2003, Austin et al., 2006b, Santos, 2012), difficulty in attracting talent (Austin et al., 2006b, Akingbola, 2006) and funding scarcity (Austin et al., 2006b, Miller and Wesley li, 2010).

Although the literature exploring new technologies in social entrepreneurship has identified that it is a relevant resource for social entrepreneurs (van Putten li and Green, 2010, Morales-Gutiérrez et al., 2012, Zahra et al., 2008, Short et al., 2009, Desa and Kotha, 2006, VanSandt et al., 2009), the researchers who have analysed the relationship between social entrepreneurs and resources available to them haven't explored technology as a resource. Rather, they have focused mostly on financial resources (Austin et al., 2006b, Miller and Wesley li, 2010) and, to a lesser extent, human resources (Akingbola, 2006, Austin et al., 2006a).

Existing research efforts aimed at understanding the relationship of social enterprises and resources they use have focused on understanding how the most extended resource mobilization strategies, optimization, and bricolage, apply to social enterprises. Optimization involves setting a goal and then acquiring the best available resources at market prices to put to use in achieving the predetermined goal (Desa and Basu, 2013, Oliver, 1997). Optimization, as a strategy, is risky for social entrepreneurs as it can derail them from their social mission due to the important financial needs it generates (Zahra et al., 2008). On the other hand, bricolage consists of the creative combination of resources easily available in the environment, which are many times undervalued or ignored by other organizations (Garud and Karnøe, 2003, Lévi-Strauss, 1966, Desa and Basu, 2013). Mair and Marti (2009), find that bricolage is a critical strategy for social mission-driven organizations. Bricolage is intimately linked to technology as an entrepreneur can open a breach of technological innovation thanks to the adaptation capacity required to use this resource gathering strategy (Garud and Karnøe, 2003). These notions, where technology is conceptualized as a resource, have been already applied to social entrepreneurship in qualitative research (Mair and Marti, 2009, Desa and Basu, 2013). However, Desa & Basu (2013) highlight in their

work what little we know about the relationship between social enterprises and the resources they use and are surprised at the limited research in this regard, given the relevance and complexity of the topic. Hence, the application of Resource Dependence Theory to social entrepreneurship emerges as an interesting line of research in this field ((Short et al., 2009, Griffiths et al., 2013). Applying Resource Dependence Theory to Social Entrepreneurship, the role of a social entrepreneur would consist of mobilizing resources available such that interdependence is reduced and the ability of the social enterprise to achieve its goals increased (Salancik and Pfeffer, 1978).

In summary, social enterprises are conditioned by the presence of resources in the environments where they operate (Weerawardena and Mort, 2006, Desa, 2012, Zahra et al., 2008) and, due to their nature, they face specific limitations (price, access to talent, access to funding) that make their dependence on the environment for the mobilization of resources necessary to reach their goals greater than that of other ventures (Austin et al., 2006b, Desa and Basu, 2013, Borch et al., 2008, Gardin, 2006, Peredo and Chrisman, 2006). We will test the applicability of Resource Dependence Theory as an explanatory theoretical framework for social entrepreneurship by testing if new technologies have the capacity to improve the interdependence of social enterprises, thus improving the ability of social enterprises to reach their goals. If Resource Dependence Theory is a powerful explanatory framework to understand the role of technology in social enterprises, then we should observe effects of the use of new technologies in social enterprises consistent with those that Resource Dependence Theory predicts.

Set of Hypotheses

This paper explores Resource Dependence Theory as a potentially powerful framework that can explain the role of new technologies in social entrepreneurship and can help us advance our understanding of social entrepreneurship. In order to test this theoretical framework, we will apply it to the case of new technologies as a resource in

social entrepreneurship in the context of the European Union at the beginning of the XXI century, when Information and Communication Technologies (ICT) use exploded in the continent.

Even though the first website was launched in 1990, it is at the beginning of the XXI century when ICTs show an explosive acceleration and the masses access their use. In the European Union, the percentage of internet users doubles from 1999 to 2002, reaching 35% of the population (WorldBank, 1999-2015). According to World Bank data, in 2009, 67% of Europe's population had access to the Internet, reaching 78% in 2014. Cell phone subscriptions in the European Union moved from 34% in 1999 to 53% in 2000 and 120% in 2009 (World Bank data), reaching 124% in 2014. Indeed, this exacerbated acceleration concentrated mostly in the first ten years of the century, while data seems to show a possible deceleration in the last few years (Criscuolo, 2015, Byrne et al., 2013).

Years 2008-2009, when data for the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* was captured, are at the heart of the ICT revolution. It is a period characterized by the proliferation of social networks (Facebook was founded in 2004 and Twitter in 2006), applications, smartphones, cheaper access to software, and greater usability of technology. This very special moment in which the data was captured makes it reasonable to consider that the qualities of what at the time was "new technologies" (technologies available since less than five years ago, before 2004) are very much tainted by the qualities of ICTs as previously described.

According to Salancik and Pfeffer (1978), the qualities that determine if a resource increases the interdependence of an organization are quantity and relevance, discretion over use, and concentration on a few agents. In the period analyzed, coinciding with the exponential expansion of ICT use in the EU, the main qualities of new technologies being launched were usability and accessibility, together with lower costs/prices. ICTs, as compared to other more expensive/complex to use technologies, became readily accessible. These technologies were not concentrated in a few agents

and, with sufficient knowledge and a limited budget; they became available for most Europeans. Thus, even if processes became very intensive in ICTs (increased relevance and quantity), according to Resource Dependence Theory, they are the kind of resource that should reduce the interdependence of social enterprises and improve their ability to reach their goals.

We start with the hypothesis that, as predicted by Resource Dependence Theory, new technologies as a resource do reduce the interdependence of social enterprises and therefore positively affect the three fundamental elements of social entrepreneurship: the social mission, innovation and market logic (Mair y Martí, 2006). In order to test our general hypothesis, we will analyze the relationship between the use of new technologies as a resource and social entrepreneurship in the European Union at the beginning of the XXI century, specifically in terms of the defining characteristics of a social enterprise: social mission, innovation and market logic.

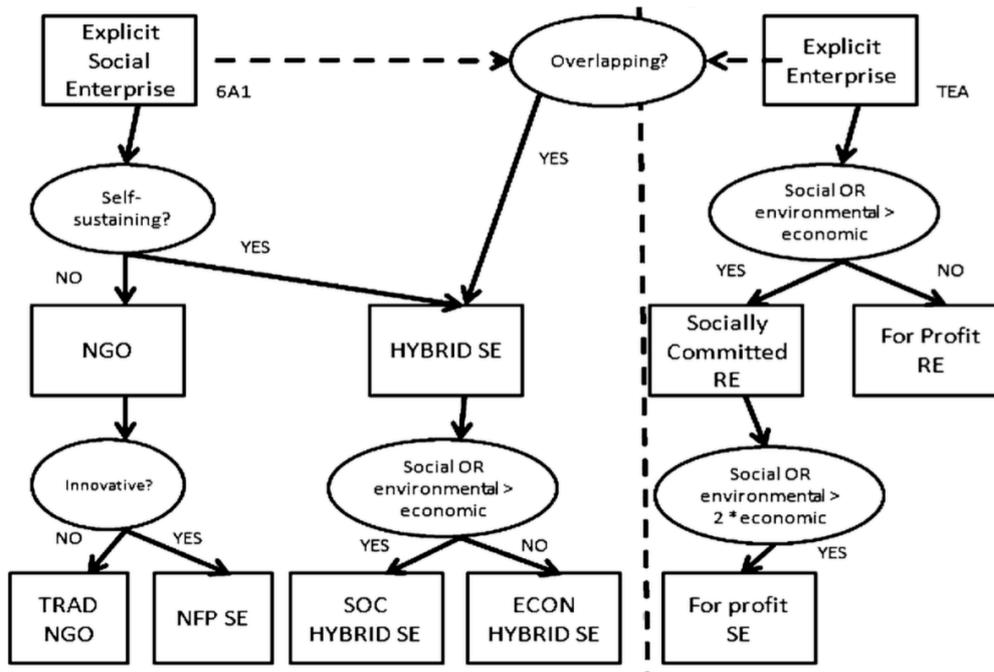
II. METHODOLOGY

Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship

In order to test the hypotheses portrayed in this paper, we apply a multiple linear regression model to the data of the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship*. The *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* portrays a methodology specifically developed to measure the prevalence of social entrepreneurship activity (SEA) in 49 countries. The project interviewed more than 150.000 individuals across the 49 countries to build the database. The surveys captured information about the entrepreneurial activity as well as demographic, economic, and social characteristics of the individuals. From the original database, this paper uses information from those countries which were members of the European Union in 2008 (when the data was captured): Greece, Holland, Belgium, France, Spain, Hungary, Italy, Romania, United Kingdom, Germany, Finland, Latvia, Croatia, and Slovenia.

The variables capturing social entrepreneurship have been built following the definitions of the authors of the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship*. Figure X shows the conceptualization of active social entrepreneurs, as defined by Lepoutre et al. (2013).

Figure X: The Social Entrepreneurship Spectrum



Source: Lepoutre et al. (2013)

This database makes it possible to aggregate the information of different countries and do a consistent regional analysis. Renowned academic experts in social entrepreneurship developed the survey used to capture information to build the database. Their rigorous conceptualization of social entrepreneurship has been broadly used in peer-reviewed research since.

Main variables

We apply a multiple linear regression model to the data of the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship*. We will consider indicators that proxy performance of social enterprises on the three main elements defining social ventures (social mission, innovation, and market logic) as dependent variables for each of the specified models and the indicators of the novelty of technologies used as independent variables.

The variables capturing social entrepreneurship and each of its categories have been built following the definitions of the authors of the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* (Justo et al., 2010).

Entrepreneur: The *Global Entrepreneurship Monitor* defines people who are active entrepreneurs as “adults in the process of setting up a business they will (partly) own and or currently owning and managing an operating young business.” (Reynolds et al., 2005, p. 209). The variable "Entrepreneur" was built strictly following the definition and process described in Figure X.

Social Entrepreneur: Following Lepoutre et al. (2013), we will use a broad definition of social entrepreneurship, considering the social mission (explicit or implicit) solely, and later establish categories. As a general definition of social entrepreneurship, we will take that of Mair and Martí (2006), which Lepoutre et al. (2013) use:

First, we view social entrepreneurship as a process of creating value by combining resources in new ways. Second, these resource combinations are intended primarily to explore and exploit opportunities to create social value by stimulating social change or meeting social needs. And third, when viewed as a process, social entrepreneurship involves the offering of services and products but can also refer to the creation of new organizations (Mair and Martí, 2006).

Innovation and market-logic delimit the different categories. According to the various combinations of these three elements (social mission, innovation, and market logic), Lepoutre et al. (2013) classify social entrepreneurship in three categories:

- Non-governmental organizations: not-for-profit organizations that have an explicit social mission, but depend on market-based income for less than 5% of their revenues. (Lepoutre et al., 2013)
- Hybrid Social Enterprises: organizations that self-identify as a social organization, receive at least 5% of their revenues from the sales of services or products or identify themselves as a regular business as well. Lepoutre et al. (2013)

- For-Profit Social Enterprises: regular enterprises for whom environmental or social objectives are twice as important as the economic ones. Lepoutre et al. (2013)

In addition to the variables conceptualizing the main constructs, the analysis considers the following independent, dependent, control, and technical variables:

Independent variables: Independent variables in the proposed models of analysis are those that define the novelty of the technology used by social entrepreneurs. The question designed by Terjesen (2009) in the *Global Entrepreneurship Monitor 2009 Report on Social Entrepreneurship* to capture the novelty of technology use is the following: “The technologies or processes needed for this product or service are available since less than one year ago, between one and five years ago or more than five years ago?”. For the statistical analysis, these three categories have been reclassified into two categories: Technologies available for five years or less and technologies available for more than five years. For hypothesis testing, the original variable has been reclassified into three dichotomous variables 0-1. The reason for reclassifying the original, categorical variable into three dichotomous variables is the impossibility of interpreting the results with the original variable as this is a categorical variable that, although it is ordinal, it does not respond to fixed increases in the novelty of the technology.

Dependent variables: As mentioned above, the literature identifies three critical elements for social entrepreneurship: Social mission, innovation, and market logic. In order to validate the explanatory power of Resource Dependence Theory as a framework to understand the role of new technologies in social entrepreneurship, we will analyze if social enterprises that use new technologies show better performance on the three elements.

Social Mission: The *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* does not capture measures of social impact that might be relevant for all social enterprises. In order to proxy the effectiveness with which social

enterprises are working towards their social mission we will proxy non-economic performance with the variable clients outside their country: We consider that social enterprises that have clients outside their countries are being able to boost their social mission internationally and, thus, are being able to amplify their social mission.

Innovation: We want to know if social entrepreneurs who use new technologies are also more innovative in non-technological ways. The *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* measures innovation in six categories: product type, production processes, product distribution, product promotion and marketing, product offering to a new market niche, the satisfaction of a need not satisfied previously. Of these, the first four may be intrinsically related to the use of new technologies. The last two are forms of innovation related to the identification of the opportunity before starting the production of the product/service. Therefore, they are innovations related to strategy rather than to the application of technology, defined as the transformation of work, capital, materials, and information into products and services of greater value.

Market Logic: The *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* captures the exposure to market logic using the percentage of market generated revenue as a proxy. For a social enterprise to expose itself or not to market logic and develop or not a market-driven revenue generation strategy is a strategic decision to make. However, once they have made the decision, Resource Dependence Theory would predict that those using new technologies should be able to generate a greater percentage of their revenues via market than those who do not. This part of the analysis does not consider for-profit social enterprises, as they, by definition, make 100% of their revenue via the market.

Control variables: In addition to the dependent variables, another common element in all models is control variables. In order to identify the variables that may constitute possible controls, we ran a correlation analysis of potentially problematic variables with the independent variables measuring of the novelty of the technology.

The variables that show a statistically significant correlation with the independent variables are age, education level, and household size. Therefore these three variables are included as controls. The rest of the variables are not included in the regression models because they do not show correlation with the independent variables and, since there are no observations for all individuals, they reduce the sample size and therefore the possibility of finding a statistically significant effect

Weights: *The Global Entrepreneurship Monitor Manual* recommends the use of weights, available in the database, in analyzing the data (Bosma et al., 2012). The use of weights to make the sample's distribution more similar to that of the actual population is common practice (Magee et al., 1998). In this paper, we use the variable `weight_A`, which provides gender and age weights for all adults older than 18 years.

The *Global Entrepreneurship Monitor Project* coordination team, as part of their quality control, evaluates the data provided by survey providers to check for systematic patterns in missing values (Bosma et al., 2012). Thus, missing values are randomly distributed and do not bias the analysis (Little, 1988). STATA automatically ignores observations with missing values.

We found extreme values affecting the analysis in the variables Size of the Household and Number of Workers.

- Size of the household: We have winsorized the variable, substituting the 1% lower and higher values with the values of percentiles 1% and 99% respectively. Since more than 1% of the lower values coincided with the value of percentile 1%, only 1% of observations have been modified. Winsorizing this variable allows us to deal with extreme values avoiding forcing normality in the distribution (Lance et al., 2014).
- Number of workers: The prevalence of extreme values in the variable Number of Workers, did not allow for techniques that preserve the results of the analysis. We have limited the analysis to companies with 40 or fewer employees.

Regression models

Hypothesis 1: Social Enterprises using new technologies have a better performance on non-economic variables than social ventures using older technologies.

We capture non-economic performance using exports (clients living abroad as captured in the database) as a proxy. We can, thus, reframe this hypothesis as: *Social Enterprises using new technologies are more likely to have clients living abroad than social ventures using older technologies.*

$$\begin{aligned} (\% \text{ of clients living abroad})_i = & \beta_0 + \beta_1(\text{Novelty of Technology} < 1 \text{ year})_i + \\ & \beta_2(\text{Novelty of technology } 1 - 5 \text{ Years})_i + \beta_3(\text{Household Size})_i + \beta_4(\text{Age})_i + \\ & \beta_5(\text{Education Level})_i + u_i, \quad i = 1, \dots, n \end{aligned}$$

Null Hypothesis: Social Enterprises using new technologies have a likelihood of having clients living abroad that is equal to or lower than that of social enterprises using older technologies.

$$H_0: \beta_1 \leq 0 \text{ y } \beta_2 \leq 0$$

Alternative Hypothesis: Social Enterprises using new technologies have a bigger likelihood of having clients living than social enterprises using older technologies.

$$H_a: \beta_1 > 0 \text{ y } \beta_2 > 0$$

Hypothesis 2: Social Enterprises using new technologies are more effective in generating market revenue than those using older technologies.

$$\begin{aligned} (\% \text{ of Market Revenue})_i = & \beta_0 + \beta_1(\text{Novelty of Technology} < 1 \text{ year})_i + \\ & \beta_2(\text{Novelty of technology } 1 - 5 \text{ Years})_i + \beta_3(\text{Household Size})_i + \beta_4(\text{Age})_i + \\ & \beta_5(\text{Education Level})_i + u_i, \quad i = 1, \dots, n \end{aligned}$$

Null Hypothesis: Social Enterprises using new technologies generate a percentage of their revenue through market strategies that is equal to or less than that of social enterprises using older technology.

$$H_0: \beta_1 \leq 0 \text{ y } \beta_2 \leq 0$$

Alternative Hypothesis: Social Enterprises using new technologies generate a percentage of their revenue through market strategies that is bigger than that of social enterprises using older technology.

$$H_a: \beta_1 > 0 \text{ y } \beta_2 > 0$$

Hypothesis 3: Social enterprises using new technologies have a greater likelihood of being innovative in non-technology aspects than social enterprises using older technologies.

$$(Non - Technology Innovation)_i = \beta_0 + \beta_1(Novelty\ of\ Technology < 1\ year)_i + \beta_2(Novelty\ of\ technology\ 1 - 5\ Years)_i + \beta_3(Household\ Size)_i + \beta_4(Age)_i + \beta_5(Education\ Level)_i + u_i, i = 1, \dots, n$$

Null hypothesis: Social enterprises using new technologies have a likelihood of being innovative in non-technology aspects that is equal to or lower than of social enterprises using older technologies.

$$H_0: \beta_1 \leq 0 \text{ y } \beta_2 \leq 0$$

Alternative Hypothesis: Social enterprises using new technologies have a greater likelihood of being innovative in non-technology aspects than social enterprises using older technologies.

$$H_a: \beta_1 > 0 \text{ y } \beta_2 > 0$$

III. RESULTS

An initial analysis of the data shows that the use of new technologies is more prevalent among social enterprises than among the rest of enterprises in the European Union in the years considered. 39% of social enterprises in the European Union in 2009 used new technologies as compared to 20% among the rest. The difference in the distribution of new technology use between social enterprises and other enterprises is statistically significant (Table X)

Table X: Equal distribution test

Chi-Squared: Novelty of technology * Social Entrepreneur vs. Other entrepreneur

	Value	df	Asymptotic sig. (bilateral)
Pearson Chi-Squared	80,483	1	,000
N	6217		

This result is especially relevant because it suggests, consistent with the literature, that the relationship between social entrepreneurship and the novelty of technology could be more intense than the relationship between entrepreneurship and the novelty of the technology. We can confirm, once again, that deepening our understanding of the relationship between social entrepreneurship and new technologies is an important contribution to the literature.

New Technologies and Non-Economic Performance in Social Enterprises

According to Resource Dependence Theory, new technologies as defined in this paper should improve the non-economic performance of social enterprises that use them. We use clients abroad as a proxy for non-economic performance and a measure of the social enterprise's ability to expand their impact. The regression analysis per social entrepreneurship category shows significant regression coefficients for variables capturing new technology use in the case of hybrid social enterprises (table X) and for-profit social enterprises (table x). Thus, we cannot reject the hypothesis that *Social Enterprises using new technologies have a better performance on non-economic*

variables than social ventures using older technologies for these two categories. In the case of Non-Governmental Organizations, the coefficient is not significant.

In general, these results support the hypothesis that *Social Enterprises using new technologies have a better performance on non-economic variables than social ventures using older technologies*.

Table X: Number of observations: New Technologies and Clients Abroad

Category of Social Enterprise	Number of Observations for Clients Abroad
Non-Governmental Organization	57
Hybrid Social Enterprise	162
For Profit Social Enterprise	118

Table X: Non-governmental organizations: New Technologies and Clients Abroad

Has clients abroad	Coef.	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	(Discarded)					
Novelty of technology 1-5 years	-0,0293	0,2380	-0,12	0,903	-0,5070	0,4484
Novelty of Technology >5 years	-0,0156	0,1805	-0,09	0,931	-0,3779	0,3467
Age Range GEM	0,0000	0,0001	-0,26	0,798	-0,0002	0,0001
UN Harmonized Education Level	-0,0346	0,0606	-0,57	0,57	-0,1562	0,0870
Household Size	-0,0310	0,0990	-0,31	0,755	-0,2298	0,1677
_cons	1,0222	0,4096	2,5	0,016	0,1999	1,8445

Table X: Hybrid Social Enterprises: New Technologies and Clients Abroad

Has clients abroad	Coef.	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	(Discarded)					
Novelty of technology 1-5 years	0,2945	0,1356	2,17	0,031	0,0265	0,5624
Novelty of Technology >5 years	0,2117	0,1317	1,61	0,11	-0,0485	0,4719
Age Range GEM	0,0000	0,0000	0,2	0,841	-0,0001	0,0001
UN Harmonized Education Level	0,0181	0,0271	0,67	0,506	-0,0354	0,0715
Household Size	0,0100	0,0636	0,16	0,875	-0,1156	0,1357
_cons	0,3090	0,2228	1,39	0,168	-0,1312	0,7492

Table X: For-Profit Social Enterprises: New Technologies and Clients Abroad

Has clients abroad	Coef.	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	0,3421	0,1682	2,03	0,044	0,0088	0,6755
Novelty of technology 1-5 years	(Discarded)					
Novelty of Technology >5 years	-0,0964	0,1403	-0,69	0,493	-0,3744	0,1816

Age Range GEM	0,0000	0,0000	-0,07	0,945	-0,0001	0,0001
UN Harmonized Education Level	0,0211	0,0419	0,5	0,615	-0,0619	0,1042
Household Size	-0,1191	0,0807	-1,48	0,143	-0,2790	0,0408
_cons	0,5838	0,3200	1,82	0,071	-0,0502	1,2179

New Technologies and Percentage of Market Generated Revenue

According to Resource Dependence Theory, new technologies as defined in this paper should improve the ability of social enterprises that have decided to generate revenue via the market to effectively attain it. In the case of social enterprises, this analysis applies to Non-Governmental Organizations who might have decided to generate a small part of the revenue via market (less than 5%) and to Hybrid Social Enterprises.

In running the regressions per category, we can only analyze Hybrid Social Enterprises, due to the low number of observations for this variable among Non-Governmental Organizations (only three observations as per Table X). The regression analysis for Hybrid Social Enterprises shows regression coefficients for variables capturing new technology use significant only at 6% rather than the 5% significance level. However, when we include the few observations for Non-Governmental Organizations in the sample (reaching a total sample size of 61). We find a significant positive impact of using new technologies in the ability of a social enterprise to generate more than 25% of their revenue via the market (Table X). We cannot reject the hypothesis that *Social Enterprises using new technologies are more effective in generating market revenue than those using older technologies.*

Table X: Number of observations: New Technologies and % of Market Generated Revenue

Category of Social Enterprise	Number of Observations for Clients Abroad
Non-Governmental Organization	3
Hybrid Social Enterprise	58
Social Enterprise (excluding for-profit)	61

Table X: Hybrid Social Enterprises: New Technologies and % of Market Generated Revenue

Percentage of market generated revenue bigger than 25%	Coef,	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	0,2506	0,1287	1,95	0,057	-0,0078	0,5089
Novelty of technology 1-5 years	0,0001	0,1601	0,00	0,999	-0,3211	0,3213
Age Range GEM	-0,0001	0,0000	-1,28	0,206	-0,0001	0,0000
UN Harmonized Education Level	0,1091	0,0404	2,70	0,009	0,0280	0,1902
Household Size	-0,2518	0,0803	-3,13	0,003	-0,4130	-0,0906
_cons	0,9547	0,1757	5,43	0,000	0,6022	1,3072

Table X: Social Enterprises (excluding For-Profit): New Technologies and Market Generated Revenue

Percentage of market generated revenue bigger than 25%	Coef,	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	0,2849	0,1265	2,25	0,028	0,0313	0,5384
Novelty of technology 1-5 years	-0,0051	0,1614	-0,03	0,975	-0,3285	0,3183
Age Range GEM	-0,0001	0,0000	-1,58	0,119	-0,0001	0,0000
UN Harmonized Education Level	0,1174	0,0400	2,93	0,005	0,0372	0,1977
Household Size	-0,2833	0,0798	-3,55	0,001	-0,4433	-0,1233
_cons	0,9978	0,1869	5,34	0,000	0,6232	1,3724

New Technologies and Non-Technology Innovation in Social Enterprises

According to Resource Dependence Theory, new technologies as defined in this paper should improve the innovativeness of social enterprises that use them in areas not related to technology. The regression analysis per social entrepreneurship category shows significant regression coefficients for variables capturing new technology use in the case of Non-Governmental Organizations (table X) and For-Profit Social Enterprises (table x). Thus, we cannot reject the hypothesis that *Social Enterprises using new technologies are more likely to be innovative in ways not related to technology than social ventures using older technologies* for these two categories. In the case of Hybrid Social Enterprises, the coefficient is not significant (table X).

Table X: Number of observations: New Technologies and Non-Tech Innovation

Category of Social Enterprise	Number of Observations for Clients Abroad
Non-Governmental Organization	58
Hybrid Social Enterprise	169
For Profit Social Enterprise	121

Table X: Non-governmental organizations: New Technologies and Non-Tech Innovation

Non-Tech Innovation	Coef,	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	-0,0117	0,0485	-0,24	0,810	-0,1090	0,0856
Novelty of technology 1-5 years	(Discarded)					
Novelty of Technology >5 years	-0,2048	0,0891	-2,30	0,026	-0,3836	-0,0259
Age Range GEM	-0,0001	0,0000	-1,17	0,246	-0,0001	0,0000
UN Harmonized Education Level	0,0307	0,0450	0,68	0,499	-0,0597	0,1210
Household Size	0,0070	0,0686	0,10	0,919	-0,1307	0,1448
_cons	1,0630	0,3014	3,53	0,001	0,4582	1,6679

Table X: Hybrid Social Enterprises: New Technologies and Non-Tech Innovation

Non-Tech Innovation	Coef,	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	(Discarded)					
Novelty of technology 1-5 years	0,0578	0,1206	0,48	0,633	-0,1805	0,2960
Novelty of Technology >5 years	-0,0684	0,1221	-0,56	0,576	-0,3095	0,1727
Age Range GEM	0,0000	0,0000	0,41	0,685	0,0000	0,0001
UN Harmonized Education Level	0,0049	0,0232	0,21	0,835	-0,0411	0,0508
Household Size	0,0195	0,0540	0,36	0,719	-0,0872	0,1261
_cons	0,7251	0,2008	3,61	0,000	0,3285	1,1216

Table X: For Profit Social Enterprises: New Technologies and Non-Tech Innovation

Non-Tech Innovation	Coef,	St. Err. Robust	T	P> t	[95% Conf. Int.]	
Novelty of Technology<1 year	0,2337	0,1172	1,99	0,049	0,0015	0,4660
Novelty of technology 1-5 years	(Discarded)					
Novelty of Technology >5 years	-0,2130	0,1307	-1,63	0,106	-0,4720	0,0459
Age Range GEM	0,0000	0,0000	-0,50	0,615	-0,0001	0,0001
UN Harmonized Education Level	0,0088	0,0417	0,21	0,833	-0,0738	0,0915
Household Size	0,0862	0,0794	1,09	0,280	-0,0711	0,2435
_cons	0,6293	0,3178	1,98	0,050	-0,0001	1,2588

IV. DISCUSSION

Our results support that the use of new technologies does improve performance in non-economic aspects of For-Profit Social Enterprises and for Hybrid Social Enterprises, both of which are more able to expand internationally, thus promoting their social mission abroad. According to our results, the use of new technologies improves the capacity of social enterprises (other than For-Profit) that have made the strategic decision to generate revenue via the market to generate a higher percentage of income through the market. Our results also support that the use of new technologies by Non-Governmental and For-Profit Social Enterprises in the European Union generates a greater probability that these social enterprises (in general) are innovative in aspects not related to technology. They are more likely to be offering their products/services to a new market niche or satisfying a need not previously met.

We find that the use of new technologies as a resource in social entrepreneurship in the European Union has different effects on the different categories of social entrepreneurs. The differences in the effects are coherent with the very identity of the type of social enterprise in which they occur. Non Governmental Organizations that use new technologies can better advance their social mission by being more innovative (users who were not being served or unmet needs). Hybrid Social Enterprises boost their social mission by expanding their impact beyond their countries and can generate a higher percentage of market revenue. For-Profit Social Enterprises have a greater likelihood of expanding internationally and are more innovative in non-tech aspects, thus tackling underserved markets.

Overall, our results suggest that new technologies, as defined in this paper (in this case mostly ICT due to the years in which data was captured) do generate in the social enterprises that use them the results that Resource Dependence Theory predicts. Thus, the empirical analysis supports the initial claim that Resource Dependence Theory is a useful theoretical framework to understand social

entrepreneurship and, more specifically, to advance our understanding of the role of technology in social entrepreneurship.

Our findings have relevant implications for social entrepreneurs and for private and public organizations interested in promoting social entrepreneurship. The application of Resource Dependence Theory can be an invaluable decision-making tool as social entrepreneurs incorporate a new technology to their processes. Analyzing if a given technology, depending on its qualities, might improve their interdependence or make them more vulnerable can help them choose what technologies to use and to hedge potential negative consequences of having to use technologies that might increase their interdependence. Consistent with the literature, we find that technology is a paramount ally for social entrepreneurs. Having theoretical models to navigate the rapidly changing opportunities and make more informed decisions will become ever more important.

Our analysis has several limitations that call for further research. Since the goal of this paper is to test the explanatory power of Resource Dependence Theory in understanding the role of technology in social entrepreneurship we needed to analyze a period and geographic region where the ICT revolution was apparent, its explosion constraint and data of those years available. This led us to use data from the *Global Entrepreneurship Monitor 2009 Special Report on Social Entrepreneurship* for the EU. Our results are valid for similar regions and instances. However, research with data from other regions, specifically developing countries, would complement these findings.

Our focus on testing quantitatively if the data showed the behaviors predicted by Resource Dependence Theory has left out qualitative considerations about why the different categories of social enterprises seem to gain different value from new technologies. Besides the sample size has limited our ability to get more granular in the per-category analysis.

Impact measurement is one of the most critical challenges facing social entrepreneurship research nowadays. The lack of a shared understanding of what

impact means and a clear quantitative indicator for it that is consistent for different social enterprises has made it impossible to analyze the direct effect of new technologies in the social impact of social enterprises. As this aspect of social entrepreneurship as a research area advances, the analysis of it in connection with new technology use would enhance the analysis presented in this paper.

V. CONCLUSIONS

By empirically confirming the hypotheses derived from the application of Resource Dependence Theory, we conclude that Resource Dependence Theory is a valuable framework in the analysis of the role of technology in social entrepreneurship.

Social entrepreneurship as a research area is relatively recent and is, as indicated in the literature, still in its infancy. This paper contributes to advance the maturation process of this discipline by validating the applicability to it of a theoretical framework well established in other areas. If consistent with the literature, we conceptualize new technologies as a resource for social entrepreneurs, then the relationship between technology and social entrepreneurship can be explained in the light of Resource Dependence Theory. This theory suggests that the emergence of an entrepreneurial project can be explained according to the availability of resources in its environment and the ability of the entrepreneur to mobilize them. The relationship between the resources available in the environment and the extent to which they are demanded generates interdependence among agents that conditions the ability of the organizations to reach their goals. The manager of the organization must reduce the interdependence of the organization by mobilizing resources such that uncertainty is reduced (resources that are not concentrated in a few agents and over which use the entrepreneur has discretion). This capacity is especially critical in the case of social entrepreneurs given the disproportion between the number of social needs they can potentially tackle and the scarce resources available to them. Thus, each resource used, depending on its characteristics and the characteristics of the social enterprise that will use it, can become an advantage or a disadvantage for achieving the goals of the social venture, depending on whether it generates or not interdependence.

If the three fundamental elements of social entrepreneurship, as derived from the literature, are social mission, innovation, and exposure to market logic, and new technologies are a resource that acts positively reducing the interdependence of social

entrepreneurs, then we should observe the effects of the use of new technologies in each of these three factors. From the contrast of the three research hypotheses set forth above, it follows that the use of new technologies does relate to each of the three fundamental qualities of social entrepreneurs. Therefore, we empirically confirm the hypotheses derived from the application of the Resource Dependence Theory. Consequently, we conclude that the Resource Dependence Theory is valuable in the analysis of social entrepreneurship and offers an opportunity for researchers in the area of social entrepreneurship to build on solid theoretical foundations that help advance the discipline.

BIBLIOGRAPHY

- AGHION, P. & HOWITT, P. 2009. *The economics of growth*, Massachusetts Institute of Technology (MIT) Press.
- AKINGBOLA, K. 2006. Strategy and HRM in nonprofit organizations: evidence from Canada. *The International Journal of Human Resource Management*, 17, 1707-1725.
- ALVORD, S. H., BROWN, L. D. & LETTS, C. W. 2004. Social Entrepreneurship and Societal Transformation: An Exploratory Study. *The Journal of Applied Behavioral Science*, 40, 260-282.
- AUSTIN, J., GUTIERREZ, R., OGLIASTRI, E. & REFICCO, R. 2006a. Effective Management of Social Enterprises. *The President and Fellows of Harvard College*.
- AUSTIN, J., STEVENSON, H. & WEI - SKILLERN, J. 2006b. Social and commercial entrepreneurship: same, different, or both? *Entrepreneurship theory and practice*, 30, 1-22.
- BACH, J. & STARK, D. 2002. Innovative ambiguities: NGOs' use of interactive technology in Eastern Europe. *Studies in Comparative International Development*, 37, 3-23.
- BACQ, S. & JANSSEN, F. 2011. The multiple faces of social entrepreneurship: A review of definitional issues based on geographical and thematic criteria. *Entrepreneurship & Regional Development*, 23, 373-403.
- BAKER, T. & NELSON, R. E. 2005. Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly*, 50, 329-366.
- BARENDSSEN, L. & GARDNER, H. 2004. Is the social entrepreneur a new type of leader? *Leader to leader*, 2004, 43-50.
- BASU, S. & FERNALD, J. 2007. Information and Communications Technology as a General - Purpose Technology: Evidence from US Industry Data. *German Economic Review*, 8, 146-173.
- BORCH, O. J., FØRDE, A., RØNNING, L., VESTRUM, I. K. & ALSOS, G. A. 2008. Resource configuration and creative practices of community entrepreneurs. *Journal of Enterprising Communities: People and Places in the Global Economy*, 2, 100-123.
- BORINS, S. 2000. Loose cannons and rule breakers, or enterprising leaders? Some evidence about innovative public managers. *Public Administration Review*, 60, 498-507.
- BORZAGA, C., GALERA, G. & NOGALES, R. 2008. *Social enterprise: A new model for poverty reduction and employment generation: An examination of the concept and practice in Europe and the Commonwealth of Independent States*, UNDP Regional Centre for Europe and the CIS.
- BOSMA, N., CODURAS, A., LITOVSKY, Y. & SEAMAN, J. 2012. GEM Manual. A report on the design, data and quality control of the Global Entrepreneurship Monitor. *Babson Park, MA, US: Babson College. Santiago, Chile: Universidad del Desarrollo. Malaysia: Universiti Tun Abdul Razak*.
- BRILLIANT 2013. Fifty Years of Social Change. *Stanford Social Innovation Review*.
- BYERS, T. H., DORF, R. C. & NELSON, A. J. 2011. *Technology ventures: from idea to enterprise*, McGraw-Hill.
- BYRNE, D. M., OLINER, S. D. & SICHEL, D. E. 2013. Is the information technology revolution over? *Available at SSRN 2240961*.
- CALIC, G. & MOSAKOWSKI, E. 2016. Kicking off social entrepreneurship: How a sustainability orientation influences crowdfunding success. *Journal of Management Studies*, 53, 738-767.

- CARRAHER, S. M., WELSH, D. H. & SVILOKOS, A. 2016. Validation of a measure of social entrepreneurship. *European Journal of International Management*, 10, 386-402.
- CHO, A. H. 2006. Politics, values and social entrepreneurship: a critical appraisal. *Social entrepreneurship*, 280.
- CHOI, N. & MAJUMDAR, S. 2013. Social entrepreneurship as an essentially contested concept: Opening a new avenue for systematic future research. *Journal of Business Venturing*.
- CHOU, D. C. 2018. Applying design thinking method to social entrepreneurship project. *Computer Standards & Interfaces*, 55, 73-79.
- CHRISTENSEN, C. 2013. *The innovator's dilemma: when new technologies cause great firms to fail*, Harvard Business Review Press.
- CIMOLI, M. & DOSI, G. 1995. Technological paradigms, patterns of learning and development: an introductory roadmap. *Journal of Evolutionary economics*, 5, 243-268.
- CRISCUOLO, C. 2015. Productivity Is Soaring at Top Firms and Sluggish Everywhere Else. *Harvard Business Review*. <https://hbr.org/2015/08/>: Harvard Business Publisher.
- CUERVO, A. 2005. Individual and environmental determinants of entrepreneurship. *The International Entrepreneurship and Management Journal*, 1, 293-311.
- DACIN, P. A., DACIN, M. T. & MATEAR, M. 2010. Social entrepreneurship: why we don't need a new theory and how we move forward from here. *The academy of management perspectives*, 24, 37-57.
- DAILY, C. M. 2002. Governance and Strategic Leadership in Entrepreneurial Firms. *Journal of Management*, 28, 387-412.
- DEES, J. G. 1998a. ENTERPRISING NONPROFITS. *Harvard Business Review*, 76, 54-67.
- DEES, J. G. 1998b. The meaning of social entrepreneurship. *Comments and suggestions contributed from the Social Entrepreneurship Funders Working Group*, 6pp, Draft Report for the Kauffman Center for Entrepreneurial Leadership.
- DEFOURNY, J. & NYSSSENS, M. 2010. Conceptions of social enterprise and social entrepreneurship in Europe and the United States: convergences and divergences. *Journal of social entrepreneurship*, 1, 32-53.
- DEFOURNY, J. & NYSSSENS, M. 2012. El enfoque EMES de empresa social desde una perspectiva comparada. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, 6-34.
- DESA, G. 2012. Resource Mobilization in International Social Entrepreneurship: Bricolage as a Mechanism of Institutional Transformation. *Entrepreneurship Theory and Practice*, 36, 727-751.
- DESA, G. & BASU, S. 2013. Optimization or bricolage? Overcoming resource constraints in global social entrepreneurship. *Strategic Entrepreneurship Journal*, 7, 26-49.
- DESA, G. & KOTHA, S. 2006. Ownership mission and environment: an exploratory analysis into the evolution of a technology social venture. *Social entrepreneurship*, 155.
- EMERSON, J. 2006. Moving ahead together: implications of a blended value framework for the future of social entrepreneurship. *Social entrepreneurship: New paradigms of sustainable social change*, 391-406.
- GALERA, G. & BORZAGA, C. 2009. Social enterprise. *Social Enterprise Journal*, 5, 210-228.
- GARCÍA-MORALES, V. J., MARTÍN-ROJAS, R. & GARDE-SÁNCHEZ, R. 2019. How to Encourage Social Entrepreneurship Action? Using Web 2.0 Technologies in Higher Education Institutions. *Journal of Business Ethics*, 1-22.

- GARDIN, L. 2006. A variety of resource mixes inside social enterprises. *Social Enterprise: At the crossroads of market, public policies and civil society*, 111-36.
- GARDNER, P. L. 1990. The technology-science relationship: Some curriculum implications. *Research in Science Education*, 20, 124-133.
- GARUD, R. & KARNØE, P. 2003. Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research policy*, 32, 277-300.
- GRIFFITHS, M. D., GUNDRY, L. K. & KICKUL, J. R. 2013. The socio-political, economic, and cultural determinants of social entrepreneurship activity. *Journal of Small Business and Enterprise Development*, 20, 341-357.
- HARADA, T. 2010. The division of labor in innovation between general purpose technology and special purpose technology. *Journal of Evolutionary Economics*, 20, 741-764.
- HELPMAN, E. & TRAJTENBERG, M. 1996. Diffusion of general purpose technologies. National bureau of economic research.
- HILLMAN, A. J., WITHERS, M. C. & COLLINS, B. J. 2009. Resource Dependence Theory: A Review. *Journal of Management*, 35, 1404-1427.
- HITT, M. A., IRELAND, R. D., CAMP, S. M. & SEXTON, D. 2002. *Strategic entrepreneurship: Creating a new mindset*, Wiley-Blackwell.
- HOOGENDOORN, P., ANDTHURIK 2010. What do we know about social entrepreneurship: an analysis of empirical research. . *Erim Report Series Research In Management*.
- JUSTO, R., LEPOUTRE, J., TERJESEN, S. & BOSMA, N. 2010. Global Entrepreneurship Monitor (GEM). Social Entrepreneurship Study: Methodology & Data. *Small Business Economics*, 1-24.
- KERLIN, J. A. 2006. Social Enterprise in the United States and Europe: Understanding and Learning from the Differences. *Voluntas*, 17, 246-262.
- KLINE, S. J. 1985. What is technology? *Bulletin of Science, Technology & Society*, 5, 215-218.
- LANCE, M., FARRELL-SINGLETON, P. & SAWILOWSKY, S. S. 2014. New Critical Values for the Winsorized t-Test. *British Journal of Applied Science & Technology*, 4, 113.
- LASPROGATA, G. A. & COTTEN, M. N. 2003. Contemplating "enterprise": The business and legal challenges of social entrepreneurship. *American Business Law Journal*, 41, 67-114.
- LEPOUTRE, J., JUSTO, R., TERJESEN, S. & BOSMA, N. 2013. Designing a global standardized methodology for measuring social entrepreneurship activity: the Global Entrepreneurship Monitor social entrepreneurship study. *Small Business Economics*, 40, 693-714.
- LÉVI-STRAUSS, C. 1966. *The savage mind*, University of Chicago Press.
- LITTLE, R. J. A. 1988. A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, 83, 1198-1202.
- MACMILLAN, K., MONEY, K., MONEY, A. & DOWNING, S. 2005. Relationship marketing in the not-for-profit sector: an extension and application of the commitment-trust theory. *Journal of Business Research*, 58, 806-818.
- MAGEE, L., ROBB, A. L. & BURBIDGE, J. B. 1998. On the use of sampling weights when estimating regression models with survey data. *Journal of Econometrics*, 84, 251-271.
- MAIR, J. & MARTI, I. 2009. Entrepreneurship in and around institutional voids: A case study from Bangladesh. *Journal of Business Venturing*, 24, 419-435.
- MAIR, J. & MARTÍ, I. 2006. Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of World Business*, 41, 36-44.
- MAIR, J., ROBINSON, J. & HOCKERTS, K. 2006. *Social entrepreneurship*, Palgrave Macmillan New York.

- MARTIN, R. L. & OSBERG, S. 2007. Social entrepreneurship: the case for definition. *Stanford Social Innovation Review*, 5, 28-39.
- MILLER, T. L. & WESLEY II, C. L. 2010. Assessing Mission and Resources for Social Change: An Organizational Identity Perspective on Social Venture Capitalists' Decision Criteria. *Entrepreneurship: Theory & Practice*, 34, 705-733.
- MORALES-GUTIÉRREZ, A. C., ARIZA-MONTES, J. A. & RODRÍGUEZ, N. M. M. 2012. El emprendedor social y el E-empowerment de las redes virtuales.
- MORRAR, R., ARMAN, H. & MOUSA, S. 2017. The fourth industrial revolution (Industry 4.0): A social innovation perspective. *Technology Innovation Management Review*, 7, 12-20.
- NEWBERT, S. L. & TORNIKOSKI, E. T. 2013. Resource Acquisition in the Emergence Phase: Considering the Effects of Embeddedness and Resource Dependence. *Entrepreneurship Theory and Practice*, 37, 249-280.
- NICHOLLS, A. 2006. *Social entrepreneurship: New models of sustainable social change*, Oxford University Press.
- NYSSSENS, M. 2007. *Social enterprise: At the crossroads of market, public policies and civil society*, Routledge.
- OLIVER, C. 1997. Sustainable competitive advantage: Combining institutional and resource-based views. *Strategic management journal*, 18, 697-713.
- ORLIKOWSKI, W. J. 1992. The duality of technology: Rethinking the concept of technology in organizations. *Organization science*, 3, 398-427.
- PEARCE, J., GRAFMAN, L., COLLEDGE, T. & LEGG, R. 2019. Leveraging information technology, social entrepreneurship, and global collaboration for just sustainable development.
- PEREDO, A. M. & CHRISMAN, J. J. 2006. Toward a theory of community-based enterprise. *Academy of Management Review*, 31, 309-328.
- REIS, T. K. & CLOHESY, S. J. 1999. *Unleashing new resources and entrepreneurship for the common good: A scan, synthesis, and scenario for action*, WK Kellogg Foundations.
- ROBERTS, D. & WOODS, C. 2005. Changing the world on a shoestring: The concept of social entrepreneurship. *University of Auckland Business Review*, 7, 45-51.
- ROH, T. H. 2016. The sharing economy: Business cases of social enterprises using collaborative networks. *Procedia Computer Science*, 91, 502-511.
- ROSENBERG, N. 1976. *Perspectives on technology*, CUP Archive.
- ROSENBERG, N. 1982. *Inside the black box: Technology and economics*, Cambridge University Press.
- SALANCIK, G. R. & PFEFFER, J. 1978. *The external control of organizations: A resource dependence perspective*, Harper and Row.
- SANTOS, F. M. 2012. A Positive Theory of Social Entrepreneurship. *Journal of Business Ethics*, 111, 335-351.
- SCHUMPETER, J. A. 1934. *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*, Transaction Publishers.
- SEANOR, P. & MEATON, J. 2007. Making sense of social enterprise. *Social Enterprise Journal*, 3, 90-100.
- SEELOS, C. & MAIR, J. 2005. Social entrepreneurship: Creating new business models to serve the poor. *Business Horizons*, 48, 241-246.
- SHANE, S. & VENKATARAMAN, S. 2000. The promise of entrepreneurship as a field of research. *Academy of management review*, 25, 217-226.
- SHORT, J. C., MOSS, T. W. & LUMPKIN, G. T. 2009. Research in social entrepreneurship: past contributions and future opportunities. *Strategic Entrepreneurship Journal*, 3, 161-194.
- SURIE, G. 2017. Creating the innovation ecosystem for renewable energy via social entrepreneurship: Insights from India. *Technological Forecasting and Social Change*, 121, 184-195.

- TERJESEN, S. L., JAN; JUSTO, RACHIDA; BOSMA, NIELS 2009. 2009 Report on Social Entrepreneurship. *Global Entrepreneurship Monitor*.
- THOMPSON, J. L. 2008. Social enterprise and social entrepreneurship: where have we reached?: A summary of issues and discussion points. *Social Enterprise Journal*, 4, 149-161.
- UCBASARAN, D., WESTHEAD, P. & WRIGHT, M. 2001. The focus of entrepreneurial research: contextual and process issues. *Entrepreneurship theory and practice*, 25, 57-80.
- VAN PUTTEN II, P. & GREEN, R. D. 2010. Does it take an economic recession to advance social entrepreneurship? *Research in Business & Economics Journal*, 3.
- VANSANDT, C. V., SUD, M. & MARMÉ, C. 2009. Enabling the original intent: Catalysts for social entrepreneurship. *Journal of Business Ethics*, 90, 419-428.
- VILLANUEVA, J., VAN DE VEN, A. H. & SAPIENZA, H. J. 2012. Resource mobilization in entrepreneurial firms. *Journal of Business Venturing*, 27, 19-30.
- WADDOCK, S. A. & POST, J. E. 1991. Social entrepreneurs and catalytic change. *Public administration review*, 393-401.
- WEERAWARDENA, J. & MORT, G. S. 2006. Investigating social entrepreneurship: A multidimensional model. *Journal of World Business*, 41, 21-35.
- WELSH, D. H. B. 2012. The evolution of social entrepreneurship: what have we learned? *Journal of Technology Management in China*, 7, 270-290.
- WONG, P. K., HO, Y. P. & AUTIO, E. 2005. Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics*, 24, 335-350.
- WORLD BANK 1999-2015. World Development Indicators. World DataBank.
- ZAHRA, S. A., GEDAJLOVIC, E., NEUBAUM, D. O. & SHULMAN, J. M. 2009. A typology of social entrepreneurs: Motives, search processes and ethical challenges. *Journal of Business Venturing*, 24, 519-532.
- ZAHRA, S. A., IRELAND, R. D., GUTIERREZ, I. & HITT, M. A. 2000. Introduction to Special Topic Forum Privatization and Entrepreneurial Transformation: Emerging Issues and a Future Research Agenda. *Academy of Management Review*, 25, 509-524.
- ZAHRA, S. A., RAWHOUSER, H. N., BHAWA, N., NEUBAUM, D. O. & HAYTON, J. C. 2008. Globalization of social entrepreneurship opportunities. *Strategic Entrepreneurship Journal*, 2, 117-131.
- ZEYEN, A., BECKMANN, M., MUELLER, S., DEES, J. G., KHANIN, D., KRUEGER, N., MURPHY, P. J., SANTOS, F., SCARLATA, M. & WALSKE, J. 2013. Social Entrepreneurship and Broader Theories: Shedding New Light on the 'Bigger Picture'. *Journal of Social Entrepreneurship*, 4, 88-107.