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“Religious beliefs lead to unscientific thinking”:

how spirituality affects innovation

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***Abstract:** In this paper we posit that entrepreneurs who share the same values with other entrepreneurs in their network are more likely to introduce innovation. We focus on spirituality, which indicates an assessment about the positive effects of religious practices both at personal and social level, along with the confidence in the existence of a supreme being. Our results show that while individual spirituality does not affect firm innovation, belonging to a network of entrepreneurs who share this value positive moderates the effect of this value on the firm probability to introduce innovation.*

*Keywords: Shared values, spirituality, innovation, social network*

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## **1. Introduction**

This paper relates entrepreneur's spirituality, sharing of values in the entrepreneur's network and firm's innovation. Extant literature has shed light on the relevance of the personality and the values of the entrepreneur and their role in explaining the strategic direction of the firm (Chatterjee & Hambrick 2007; Zhao et al. 2010; Kickul & Gundry 2002; Marcati et al. 2008; Hemingway 2005; Fauchart & Gruber 2011; Lim & Putnam 2010). Social psychologists have introduced the idea of social identity to theorize how individuals conceptualize themselves in a social contexts. Tajfel (1972) defined social identity as "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership" (Tajfel 1972: p.292; Hogg & Terry 2000). Following the social identity theory, we posit that entrepreneurial activities are an expression of an the entrepreneur social identity, and hence influenced by the values that are shared and accepted in the network to which the entrepreneur belongs. In this paper we focus on spirituality, which is increasingly used to define the personal and subjective side of religious experience (Hill & Pargament 2008). The recent work of Spear (2010) reported several cases (for example, the Quakers in England in the nineteenth century or the network of Protestants in Latin America) in which membership of a cohesive group with strong religious connotation has facilitated the development of new business ideas, suggesting the existence of a link between shared values and economic practice.

## **2. Theoretical background**

Scholars agree that firms belonging to networks are likely to be more innovative than isolated firms (Ahuja 2000; Baptista 2000; Baptista & Swann 1998; Brass et al. 2004; Podolny & Stuart 1995; Powell et al. 1996). There are several issues that can explain this evidence. Within networks, sharing of information, resources and knowledge among firms are facilitated and, hence, the likelihood of producing new ideas increases (Dahl & Pedersen 2004; Sorenson et al. 2006; Storper & Walker 1989). This is due to the presence of a set of relationships established by professionals that enable localized learning and knowledge sharing among firms (Giuliani & Bell 2005; Keeble & Wilkinson 1999; Ceci & Iubatti 2012). The learning processes of firms are expedited if firms are exposed to external sources of knowledge that enhance knowledge exchanges (Burt 1992; Inkpen & Tsang 2005; Knoke 1990). We posit that one of the key factors that facilitate knowledge exchanges in a network is the fit, or congruence, of the individual with the values of the network.

The concept of fit has a long tradition in organizational behaviour studies (Nadler & Tushman 1998). O'Reilly et al (1991) explain that organizational behaviour researchers have usually followed one of following two approaches: the first analyses the interaction of individual characteristics and the

occupational attributes (Drazin & Van De Ven 1985; Venkatraman 1989); the second focuses on the fit between specific characteristics of an organization and the characteristics of the people working in it (Chatman 1989; Joyce et al. 1982). In this paper we follow the second approaches looking at the fit between the entrepreneur and his (her) network. It is therefore a person-situation fit: if there is a fit between the entrepreneur and the network, it means that the entrepreneur shares with the other members of the network understanding, evaluation and interpretation of the world. Therefore this fit is likely to diminish conflicts and misunderstandings in the communication process, generating positive effects on the entrepreneur propensity to exchange knowledge with others and enhancing innovation and organizational performance.

To explore the entrepreneur-network fit we use spirituality, an individual social axiom. Spirituality indicates an assessment about the effects of religious practices both at personal and social level, along with the confidence in the existence of a supreme being. In doing his (her) job, an entrepreneur achieves both objective and subjective goals. The subjective dimension of the entrepreneur pertains “the dispositions and habits of the subject; they determine him; they make him what he is and what he is to be” (Lonergan 1998, p.223). A critical challenge for researcher is to consider and measure the subjective dimension. We consider spirituality to be a good proxy for this dimension since it gives information of the intimate credence of the person. We therefore believe that a fit between the levels of entrepreneurs’ spirituality and spirituality in his (her) network has a positive effects on innovation. This lead to the following hypotheses:

*Hp1: The fit between entrepreneur’s spirituality and the level of spirituality of entrepreneur’s network increases the likelihood to introduce innovation.*

### **3. Method**

#### *3.1. The empirical context*

Our empirical context is represented by CDO, an association of firms that follows the values pursued by the Roman Catholic Church to the economic activities (Nanini, 2011). Its members share the same norms, principles and values. When data were collected, CDO had about 36,000 members, mainly profit companies. CDO’s main goal is to promote and develop relationships among its members and between these members and non-member organizations.

#### *Data collection*

In order to collect the data to explore the research questions described so far, we adopted a two-step research strategy integrating qualitative research methodologies with quantitative research methodologies (Creswell, 2003). In November 2012, we conducted a preliminary study on the innovation dynamics occurring in A local branch of the CDO association, collecting 23 interviews, 14

with general managers or CEOs and 9 with those responsible for other functions (e.g., sales, finance, production, marketing) (Ceci, Masciarelli, & Poledrini, 2014). In September and October 2014, we conducted 10 additional exploratory interviews, with key informants associated to the CDO association and identified by the president of CDO, Dott. Bernhard Scholtz. The complete list of the interviewees can be found in the appendix A.

On the basis of the understanding gained by the two waves of exploratory interviews, we developed a questionnaire that we distributed during the three days of the “Matching 2014” event, a fair held the 26-27-28 November 2012 in Milan and organized by the CDO association. We contacted all the firms participating to the fair that matched the following criteria: under 250 employees; entrepreneur present during the fair; part of the following industrial sectors: construction & furniture, food, industrial products, logistics, mktg & communication, networking, software & ict, power & ecology. The population consisted of 369 firms that represent our sample. To set up interviews, one researcher contacted the entrepreneurs included in the sampling frame and briefly explained the aim of the research and the content of the questionnaire. During the three days of the fair, researchers contacted entrepreneurs several time for offering help in compiling the questionnaire. We collected 109 questionnaires, leading to a response rate of 30%.

### *3.2. Questionnaire structure and variables definition*

In order to investigate the issue, we constructed the data collection instrument as follows: we prepared 2 questionnaires, to avoid common method bias. Two different members of the firm filled the two questionnaires. Questionnaire A has been to distributed to entrepreneurs and it was used to build the independent variables. Social axioms are generalized beliefs about oneself, the social and physical environment, or the spiritual world, and are in the form of an assertion about the relationship between two entities or concepts. Based on empirical results from more than 40 countries, Leung and Bond (Leung & Bond 2004) extended the results of the earlier Leung et al (Leung et al. 2002) study and identified five dimensions – cynicism, reward for application, religiosity, fate control, and social complexity – as pan-cultural dimensions of belief that characterize individuals and relate to differences in individual behaviours. The questionnaire language is the Italian: the method of back-translation was used to check the quality of the translation, and changes made where inaccuracies had been revealed through the process (Bensaou & Venkatraman 1995; Leung et al. 2002). Assessments were made using a five-point scale, ranging from (1) ‘strongly disagree’ to (5) ‘strongly agree’.

For the present work, we used the axiom “spirituality”, composed by the following items: “belief in a religion helps one understand the meaning of life”; “belief in a religion makes people good citizens”; “religious faith contributes to good mental health”; “there is a supreme being controlling the universe”; “religious people are more likely to maintain moral standards”; “religion makes people escape from reality”; “ghosts or spirits are people’s fantasy”; and “religious beliefs lead to unscientific

thinking”. The spirituality variable is formed aggregating the 8 items, weighted by their respective factor scores. We conducted several tests to assess the psychometric properties of the measures. The analysis suggests that the items to be interrelated can be expressed in a common dimension (eigenvalue 1.81). Cronbach’s alpha value is 0.66, thus providing strong evidence of construct reliability. Questionnaire B has been distributed to a representative of the firm (not the entrepreneur) with a complete knowledge of the performance of the firms, especially in terms of internationalization and innovation. Questionnaire B has been used to collect the dependent variable used in this study: product innovation, a dummy variables assuming the value of 1 if the firm has implemented a product innovation (either radical or incremental) in the period 2011-2013.

As control variables, we used the size of firms (we used as a proxy the number of employees in the 2013), the investment in R&D (a dummy variable that assume the value of 1 if the firm invested in R&D in the period 2011-2013, 0 otherwise) and the geographical location (dummy variables for Northwest, Northeast, Centre and South of Italy).

### 3.3. Data analysis

The empirical context selected for the study is an association of firms that follows the values pursued by the Roman Catholic Church (Nanini, 2011). Therefore, we expect a higher value in the variable “spirituality” among members that participate to the association. In order to control for this assumption, we performed a t-test for independent group and we the measured of the “spirituality” variable between two groups: entrepreneurs not associated to CDO and entrepreneurs associated to CDO. The test assumes that variances for the two populations are the same. Results show that the t-statistic is -1.763 with 63 degrees of freedom. The corresponding one-tailed p-value is 0.04, which is less than 0.05. We conclude that the difference of means between entrepreneurs not associated to CDO and entrepreneurs associated is lower then 0. Therefore, the mean of the variable “spirituality” for entrepreneurs not associated to CDO is lower then the mean of the variable “spirituality” for entrepreneurs associated to CDO.

On the basis of such results, to determine the effect of shared values in innovation performance we estimated the direct model (1) and the moderated model (2). The hypothesis was tested by assessing the significance of the coefficient  $b_5$  and the significance of the increase in the adjusted  $R^2$  between the direct and moderated models. We estimated the models using a logit regression model. No evidence of multicollinearity was found: the largest correlation among regression variables was 0.31 (table 1). Results from the regression analysis can be found in table 2.

$$\text{Innovation} = \alpha + \beta_0 \text{spirituality} + \beta_1 \text{CDO membership} + \beta_2 \text{R\&D} + \beta_3 \text{firm size} + \beta_4 \text{Northwest} + \beta_5 \text{Northeast} + \beta_6 \text{Centre} + \varepsilon \quad (1)$$

$$\text{Innovation} = \alpha + \beta_0 \text{spirituality} + \beta_1 \text{CDO membership} + \beta_2 \text{CDO membership} * \text{spirituality} + \beta_3$$

$$R\&D + \beta_4 \text{firm size} + \beta_5 \text{Northwest} + \beta_6 \text{Northeast} + \beta_7 \text{Centre} + \varepsilon \quad (2)$$

The direct model (Model 1) yields the following results: being member of the CDO association (+3,470) positively impact on the dependent variable “innovation”. The variable “spirituality” is slightly significant (-1.055, p=0.142) and suggests a negative (but not significant) effect of spirituality on innovation. The moderated model (Model 2) confirms the positive effect of the variable “CDO membership” (+6.383) and the negative effect of the variable “spirituality” (-5.964). As regards the interaction term “CDO membership × spirituality” is positive and significant, while the direct effect of the variable “spirituality” is negative and significant (-5.964). There is an increase in the Pseudo R2 (+0.129) suggesting that the moderated model is better in explaining the dependent variable.

#### 4. Discussion and conclusions

The two models discussed above help us to explore the link existing among entrepreneur’s spirituality, the sharing of values in the entrepreneur’s network and firm’s innovation. The role of common religious beliefs in economic history has been largely documented (see the work by Spear, 2010) and in this paper we aimed to understand if the entrepreneur personal religious beliefs and the membership in a cohesive group with religious connotation facilitates the development of new business ideas, suggesting the existence of a link between shared values and economic practice.

To investigate the concept of spirituality we used items for the social axioms survey. Our results lead to the following two main results: i) spirituality alone has no effect on innovation; ii) participation in a network characterized by shared values facilitates innovation.

With the term spirituality we refer to the beliefs of entrepreneur that asserts the existence of supernatural forces and the beneficial functions of religious belief (Leung et al. 2002). We found no effect on the innovation variable suggesting that this social axiom do not influence the innovative performance of the firms per se. Unlike other personal characteristics of the entrepreneur (Zhao et al. 2010; Kickul & Gundry 2002; Marcati et al. 2008; Fauchart & Gruber 2011), our findings suggest that this aspect of the entrepreneur personality does not affect the performance of the firm. We believe that this is an important result that permit to put some boundaries to the recent flourishing of research aiming at investigate the existence of links among entrepreneur or CEO personal aspects and firms performance. Although this aspect can deserve further attention, on the basis of the present results, we cannot establish any link between entrepreneur spirituality and innovation of the firm.

The second finding confirms that the participation in a network characterized by shared values facilitates innovation. This is consistent with previous studies suggesting that being embedded in a bonding social capital context supports support innovation, increasing the overall innovative performance of the firms. In fact, firms receive several advantages from being embedded in contexts

that, both intentionally and unintentionally, connect people to other people, firms, and their resources and knowledge (Laursen et al. 2012; Putnam 1993). In our specific case, we observe a case of network closure, or what Putnam (1995) called the “bonding” social capital. In this case, linkages among actors within a group “give the collectivity cohesiveness and thereby facilitate the pursuit of collective goals” (Adler & Kwon, 2002 :21).

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