

Cultural Values as Catalysts of Technological Innovation

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Innovation is a key element for companies that aim to achieve and sustain a competitive advantage. A great number of academics and practitioners have focused on the role of cultural values to provide further incentives to firms to invest more in innovation that will give them a market edge.

Keywords: technological innovation ; cultural values ; sustainable growth

1. Introduction

Innovation is a critical factor for companies that aim to achieve and sustain a competitive advantage ^{[1][2]}. Drucker ^[3] in his seminal paper highlighted the importance of innovation in the challenging and complicated business environment. According to Subramaniam and Youndt ^[4], the two main classifications of innovation are incremental and radical. It is argued that companies with better innovative capabilities can achieve higher levels of profitability, whereas such a process may lead to a country's economic development. Therefore, it is of paramount importance to understand the determinants of a firm's innovative ability (see for example Boubakri ^[5], Chen et al. ^[6] and Jourda and Smith ^[7]). This issue has attracted substantial attention among academics and practitioners over time, while in reference to managerial incentives and skills, corporate governance, and firm competitiveness and size are considered the main determinants of innovation. Thus, Hirshleifer et al. ^[8], Chang et al. ^[9], Chen et al. ^[10] and Cho et al. ^[11] among others provide significant evidence that higher levels of innovation are linked to managerial contracts that lead to higher rewards based on long-term success as opposed to short-term benefits of the shareholders, while Agoraki et al. ^[12] examine the types of innovation that influence sustainable development. Innovation can serve as a key driver of sustainable development, providing the appropriate technologies and approaches needed to address complex challenges and create a more sustainable future. Ferlito and Faraci ^[13] and Oliveira-Dias et al. ^[14] consider business model innovation a key factor for competitive advantage and corporate sustainability. On the same strand, Yang et al. ^[15] argue that innovation can lead to sustainability. Previous research also shows that higher levels of innovation are associated with CEO overconfidence and managerial ability, among others.

In a nutshell, according to alternative theories of entrepreneurial entry ^{[16][17][18]}, it is argued that the issue of an individual's engagement in entrepreneurial activities depends not only on the individual's abilities and skills but also on the cultural values dominating in the society. Cultural values are the core element of culture, while the outer layers consist of the rituals, heroes and symbols shared by a social group ^[19]. Moreover, as Newberry et al. ^[20] underline, social culture could shape entrepreneurial identity, which is a crucial element for a future career in the field. Overall, three main directions have been formulated in the relevant literature on the relationship between cultural values, entrepreneurship and innovation. The first direction through which cultural values influence the individual's willingness to engage in entrepreneurial activities refers to a "pull" perspective of the cultural impact on entrepreneurship and innovation. This channel of reasoning highlights the importance of psychological factors on entrepreneurship motives ^[21]. Etzioni ^[22] and Fayole et al. ^[23] bring to the surface a second direction of entrepreneurship motivation.

Incentives to promote innovation at the country and firm level require a strong national and organizational culture that encourages risk taking and a high degree of tolerance for failure in the short run to receive the rewards in the long run ^[24]. Cultural values are also considered important elements for business outcomes, given that companies are an integrated part of society since firms are interrelated with local customers, suppliers and employees. Therefore, as Bloom et al. ^[25] argue, cultural norms have a significant effect on the values and the firm's economic and social behavior. In his seminal work, Porter ^[1] underlines that firms must innovate to enhance their competitive advantage and survive in an increasingly globalized environment, while Pistikou et al. ^[26] show in a recent study the importance of innovation for S&P500 companies. Cultural values reflect characteristics which are inherited in the population that take many decades to change,

implying a lasting trace on the practice of entrepreneurship at the national level [27]. Shane [28] underlines that countries need to promote those cultural values that encourage innovation while stating that investing in research and development is a required but not sufficient condition for improvements in innovation performance. On the same strand, Deirmentzoglou et al. [29][30] investigate the influence of culture on sustainable development.

Sufficient empirical evidence suggests that cultural values significantly affect the rates and types of national entrepreneurial activity [16][31]. The empirical evidence is further strengthened by surveys that show that an entrepreneurial career finds its roots in young people. Bergman et al. [32] suggest that the increase in university education influences entrepreneurship and innovation significantly as it contributes to knowledge transfer from university classrooms and research laboratories to the markets.

2. Cultural Values as Catalysts of Technological Innovation

Hofstede [33] argues that certain values which are transmitted from generation to generation within a society provide the framework for the formation of specific attitudes, motivation and behavioral patterns that frame the so-called mental programming: culture. In his seminal work, Hofstede [19][33] proposes six cultural values: (a) power distance—the level at which a person approves of hierarchy, even when there is no adequate justification; (b) uncertainty avoidance—the level at which a person experiences uncertainty as uncomfortable; (c) individualism vs. collectivism—the level at which a person feels part of a group; (d) masculinity vs. femininity—the level at which the use of power is socially approved; (e) long-term vs. short-term orientation—the level at which a person focuses on the future or the present; and (f) indulgence vs. constraint—the degree to which a person feels free to express himself.

Shane [28] provides one of the earlier research works on the investigation of a possible relationship between national culture and innovation. He analyzes a sample of 33 countries for the period from 1975 to 1980 and concludes that the rates of innovation (proxied as the per capita number of trademarks) are mainly associated with uncertainty avoidance as well as power distance and individualism.

Boubakri et al. [5] examine whether and how cultural values have an impact on corporate innovation. They employ a comprehensive database on innovation for a large sample of countries that covers a long period of time to capture the entry of new innovators, changes in business cycles and other effects that might appear in the long run. They control the impacts of formal institutions, and firm-level and country-level variables, as well as for cultural zones. They find strong evidence that cultural values have a significant influence on innovation. Specifically, their analysis shows that it is more likely that a firm will undertake more investment on innovation in societies that are individualistic, indulgent and long-term oriented, as well as in cultures with less power distance, less uncertainty avoidance and less masculinity. Furthermore, Boubakri et al. [5] argue that the baseline results are maintained when they only consider the subsample of innovative firms, namely, that there is a significant impact of culture on firms' innovation performance/quality. Their analysis also deals with the issue of the potential endogeneity of culture. Although reverse causality is unlikely to run from innovation to culture, Guiso et al. [34] argue that values, beliefs and preferences exhibit long memory and therefore are very slow to change. Using a 2SLS-IV econometric approach with appropriate instruments as well as the GMM approach, the reverse causality hypothesis is rejected, and therefore, the baseline results are shown to exhibit robustness. Boubakri et al. [5] argue that the results of their analysis have important implications for both managers and policy makers. Thus, the strong evidence that there is a statistically significant positive relationship between cultural values and innovation directly implies that investment in research and development by firms, although it is a requirement, is not a sufficient condition to promote innovation and entrepreneurship. Therefore, government policies and programs need to be designed to boost innovative behavior in the long run.

Espig et al. [35] examine the relationships between different cultural values and innovation. They employ innovation data by country to unveil those characteristics of national cultural dimensions that contribute to firms' decision making to increase investment in innovation. They conduct their analysis using the Hofstede's national culture database, as well as the innovation index from the GII database, while the population data are retrieved from the World Bank database for the period 2015–2018. Espig et al. [35] confirm that cultural values influence innovation rates positively. Moreover, they find that innovation levels are expected to be higher in societies where one observes a low distance from power, high individualism, femininity characteristics, low aversion to uncertainty, long-term orientation and a higher level of indulgence. Bogatyreva et al. [36] focus on the link between intention and translation to entrepreneurial behavior. Based on this stylized fact, Bogatyreva et al. [36] employ data from two groups of the multi-country Global University Entrepreneurial Spirit Students' survey conducted in 2011 and 2013/2014. Their main finding is that national culture influences the link between entrepreneurial intention and subsequent action.

Chen et al. [6] also examine the mechanism through which cultural norms influence corporate innovation. The researchers show that firms located in societies in which we observe higher levels of the uncertainty avoidance dimension are expected to produce a lower number of patents, usually of lower importance, leading to the conclusion that in this case, firms are less efficient with their R&D expenditure. The main finding of their study is that cultural values have a significant impact on firms' decisions to increase innovation in a global context. Furthermore, Chen et al. [6] show that the differences in national culture are an equally important factor to boost investment in innovation among Asian and non-Asian countries.

Strychalska-Rudzewicz [37] also examines the nexus between cultural values and the level of innovation using data for a large group of developed and emerging countries. In principle, it is shown that cultural factors play an important role in creating innovation. Strychalska-Rudzewicz [37] explains that the hypothesis formulated by Shane [28] that the dimensions of low power distance and strong individualism have a substantial influence on the level of innovation, despite such a causal relationship, does not seem to hold for Far East Asian countries. Such weak evidence in the case of Far East Asian countries may be attributed to cultural differences with the rest of the countries in the sample. In addition, it is shown that the dimensions of low power distance and low uncertainty avoidance are most likely to increase the levels of innovation in European countries. Finally, the results for the dimension of individualism vis-à-vis collectivism are not clear-cut, but still, those European countries that are more individualistic achieve better innovation levels. In a related study, Lee et al. [38] analyze the influence of the Hofstede cultural dimensions on the Global Innovation Index scores during the pre- and post-crisis years of the 2007–2009 financial crisis and the 2019–2021 COVID-19 pandemic. The main finding shows that the same cultural characteristics are the driving force for increasing the level of innovation either before or after each of the two crises under consideration. By contrast, Lee et al. [38] argue that an important factor for innovation performance is the income group that has a significant impact on the relationship between cultural characteristics and innovation.

Papula et al. [39] examine the impact of cultural values on innovation activities. Their analysis is conducted with two cultures from the European region. The first group of countries under investigation consists of Germany, Austria and Switzerland, whereas the second group is represented by the Czech Republic. Their analysis is undertaken with the employment of a large-scale questionnaire survey in 2015–2018. The main findings of their analysis imply that cultural aspects in the examined groups have a strong impact on innovation, and this finding is robust across both groups. Jourdan and Smith [7] also examine the causal relationship between cultural values and the levels of innovation. They investigate this relationship by looking at the link between countries' innovation, entrepreneurship and creativity, and the six cultural values. Specifically, Jourdan and Smith [7] suggest four measures that are associated with economic development and innovation, whereas the factor structure of Hofstede's six cultural dimensions were reduced to these major factors, namely, heteronomy–autonomy, gratification, and competition–altruism. The main finding of the regression analysis shows that heteronomy–autonomy and gratification predict the Global Innovation Index, whereas gratification predicts the other three measures of economic development and innovation, namely, the Global Entrepreneurship Index, the Global Creativity Index and the Bloomberg 50 most innovative countries (B50), confirming the positive relationship between culture and levels of innovation. Murswieck et al. [40], using a sample of 28 European countries, find that the cultural dimension of indulgence leads to an improvement in the levels of innovation, as proxied by the European Innovation Scoreboard.

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