Social Capital and Innovative Capabilities in Organisations: the Moderating Role of Technology and Market Environment for ANZAM paper

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ABSTRACT: Using data collected from 292 innovative companies in China, this paper attempts to investigate the relationships between corporate social capital and firm innovative capabilities. We looked into two dimensions of corporate social capital (i.e., internal and external corporate social capital) and firm innovative capabilities (i.e., technology and market innovative capabilities), respectively. We also tested the moderating effects of technology and market environment dynamics. Our preliminary findings indicated that corporate social capital had significant and positive correlations with firm innovative capabilities, while the moderating effects of technology and market environment dynamics appeared less clear and more elusive.

Keywords: social capital, innovation capabilities, technology environment, market environment

INTRODUCTION

From the resource-based view (Barney, 1991), a firm’s abilities to innovate are critical organisational capabilities and assets, which in turn form a crucial foundation for competitive advantages (Hall, 1993). In light of increasingly intense global competition, innovation has become top priorities among CEOs (Porter & Stern, 1999) and central for strategy-making (Knight & Cavusgil, 2004). Not surprisingly, innovation is argued to be at the core for firms to agilely adapt itself to rapidly changing competitive forces in the market (Utterback, 1994).

Concurrent with the growing scholarly attention paid to innovation, especially a firm’s capability to innovate (for overviews, see Wolfe, 1994; West & Bogers, 2014), there has been a growing number of
theories attempting to explain factors differentiating innovative firms and their less successful counterparts (see Lawson & Samson, 2001). From a dynamic capabilities perspective, Lawson and Samson (2001) proposes a conceptual framework on developing innovative capability in organisations. Our ongoing research builds on this framework (Lawson & Samson, 2001) and relevant existing research (e.g., Yli-Renk & Autio, 2001; Adler & Kwon, 2002), aiming to contribute to our understanding of the complex relationships among a firm’s social capital, external environment, firm resources and innovation. This paper reports part of the research results on the hypothesised relationships between social capital and innovative capabilities, in particular, putting the spotlight on the moderating role of technology and market environment. By analysing quantitative data collected from 292 enterprises in 24 provinces (including Hong Kong) in China, our preliminary findings showed that the environmental factors partially moderates the relationships between social capital and innovative capabilities in organisations, while its moderating effects varied according to different types of social capital and innovative capabilities. The next section review the literature and present the relevant hypotheses.

LITERATURE REVIEW

This section reviews existing research on corporate social capital and innovative capabilities to derive the hypotheses for this study. We begin by reviewing literature on corporate social capital.

Corporate Social Capital

The concept of social capital can be traced back to Loury (1977) who proposed an economic theory on racial income differences. Since then, a growing number of scholars have broaden the scholarship in a variety of fields from sociology, political science, economics and organisational science (Adler & Kwon, 2002). More recently, Putnam (2000) suggests that social capital refers to the propensity of social cooperation to yield socially efficient outcomes among people in a society. In accordance with this view, research on social capital and innovation has been more popularly looking at country and regional levels (e.g., Akçomak & Ter Weel, 2009; Murphy, Huggins & Thompson, 2016). While
empirical evidence shows that social capital has significant contributions to innovation at the macro levels, scholars have been trying to investigate the contribution of social capital to innovation at organisational levels (e.g., Wadhwa, McCormick & Musteen, 2017; Martínez-Pérez, García-Villaverde & Elche, 2016). These preliminary studies indicate that social capital in the organisational context has statistically meaningful correlations with firm innovation.

Corporate social capital is defined as the forming and mobilising processes regarding social actors’ network connections within and between organisations in order to gain other actors’ resources (Knoke, 1999, p17). Although the concept of corporate social capital has been spanning over a decade and the importance of social capital for corporations recently argued for (Servaes & Tamayo, 2017), the research examined social capital at organisational levels has been limited. Among the studies, most of them have tended to focus on the economic outcomes of social capital, i.e., firm performance (e.g., Chen, Hsu & Chang, 2016; Amiraslani, Lins, Servaes & Tamayo, 2017). However, there is an up-and-coming stream of scholarship attempting to study the relationships between corporate social capital and innovation. These studies have looked at corporate social capital through the lens of knowledge sharing (i.e., Lin, 2007), social responsibility (e.g., Martinez-Conesa, Soto-Acosta & Palacios-Manzano, 2017), corporate venture social portfolio (e.g., Wadhwa, Phelps & Kotha, 2016) and social networks (e.g., Wadhwa, McCormick & Musteen, 2017). In this paper, we follow several authors who look at corporate social capital from the network perspective and define it, broadly, to include both internal and external social networks of the organisation (e.g., Barroso-Castro, Villegas-Periñan & Casillas-Bueno, 2016; Perez & Beauchesne, 2016).

**Innovative Capabilities**

Drucker (1985) suggested that innovation is to integrate resources in ways that create wealth, while innovative capability can be learned. More recent research looks at innovation from different viewpoints. From the angel of knowledge creation, innovative capability is considered as to produce new knowledge and products (Hagedoorn & Cloodt, 2003). From a dynamic capabilities perspective, Lawson and Samson (2001) proposes a conceptual framework on developing innovative capability in
organisations. They argue that innovative capability should be viewed holistically in organisations, where the focus should be looking at both the internal innovative processes and the external market. In addition, the effort of differentiating innovation also covers social structure factors and technologies (Damanpour, 1991). The most established categorisation of innovation was incremental and radical innovations, proposed by Dewar and Dutton (1986). The incremental innovation involves ‘improving and exploiting an existing technological trajectory,’ whereas the radical “disrupt an existing technological trajectory’ (Gatignon, Tushman, Smith & Anderson (2004, p1107). Accordingly, Subramaniam and Younrdt (2005) defined incremental innovative capability as the capability to generate innovations that ‘refine and reinforce existing products and services’, whereas radical innovative capability innovations that ‘significantly transform existing products and services’ (p452).

Despite the different approaches of classifying innovation and innovative capabilities, the majority of research has looked at innovation based on the premise of knowledge sharing, transferring and transforming, emphasising innovative capabilities as part of intellectual resources of the organisation which may include social capital (Subramaniam & Younrdt, 2005). Empirical evidence shows that innovative capabilities have positive relationships a variety of desirable organisational outcomes, such as export performance (Guan & Ma, 2003), financial performance (Bharadwaj, 2000) and firm performance (Calantone, Cavusgil & Zhao, 2002). From a practical viewpoint, Bodgan and Villiger (2008) suggest investors emphasise on innovative capabilities in making valuation decisions.

Given the fact that innovative capabilities have been differently defined and studied, and its empirical studies adopted varied measurements, a unified conceptualisation is hard to find. Accordingly, we searched within the literature and found Weerawardena’s (2003) point of view closer to our direction for the (ongoing) research. Weerawardena (2003) suggest firms develop on both the technological and non-technological fronts simultaneously. Similarly, technology and market changes are suggested as two important ingredients for organisational innovation (Tidd, Bessant, & Pavitt, 1997). Consequently, this study focuses on the technology and market aspects of innovative capabilities. The next subsection explains the specific hypotheses of this study.

Hypotheses
From the resource-based view (Barney, 1991), social capital is an important form of firm resources and a foundation of firm competitive capabilities and competences. While the linkages between social capital and innovative capabilities have been widely assumed and limitedly tested, the existing research has largely studied the two concepts at macro levels. For example, Tura and Harmaakorpi (2003) conducted a theoretical assessment of the relationships between social capital and innovative capabilities at a regional level. They suggested several conceptual space connecting the two concepts, having concluded social capital’s theoretical significance in building regional innovative capabilities. Later on, they carried out another study to discuss the linkages between social capital and regional innovative capabilities (Tura & Harmaakorpi, 2005), further demonstrating urgency to put an emphasis on social capital in developing regional innovative capabilities. However, the existing research on social capital and innovative capabilities is both limited and unintegrated. This is especially so at organisational levels. We found little research which has explicitly studied the contributions of corporate social capital to innovative capabilities in organisations; although a few studies have looked at firm innovative capabilities from the perspective of knowledge sharing, most of which looked at Chinese contexts (e.g., Lin, 2007; Liao, Fei & Chen, 2007). Preliminary empirical and conceptual evidence suggests that corporate social capital, especially when considered as part of intellectual resources of the firm (Subramaniam & Youndt, 2005), contributes significantly and positively to the innovative capabilities in organisations. In order to understand the relationship between corporate social capital and firm innovative capabilities at a more nuanced level, and based on the literature above reviewed, we decided to look at corporate social capital from both external and internal perspectives and firm innovative capabilities on technology and market dimensions. Because the firm’s environment shapes how its internal activities are organised and strategic resources configured and has significant influences on innovation (Porter, 1991), we also include two types of environmental factors, i.e., technology market environment factors, to test the its moderating effects of the relationships. Thus, we put forward the following hypotheses for the present study:
Hypothesis 1a: There is a positive correlation between external corporate social capital and firm market innovative capability, where technology environment moderates the relationship.

Hypothesis 1b: There is a positive correlation between internal corporate social capital and firm technology innovative capability, where technology environment moderates the relationship.

Hypothesis 2a: There is a positive correlation between external corporate social capital and firm technology innovative capability, where market environment moderates the relationship.

Hypothesis 2b: There is a positive correlation between external corporate social capital and firm market innovative capability, where market environment moderates the relationship.

Hypothesis 3a: There is a positive correlation between internal corporate social capital and firm market innovative capability, where technology environment moderates the relationship.

Hypothesis 3b: There is a positive correlation between internal corporate social capital and firm technology innovative market capability, where technology environment moderates the relationship.

Hypothesis 4a: There is a positive correlation between internal corporate social capital and firm market innovative capability, where market environment moderates the relationship.

Hypothesis 4b: There is a positive correlation between internal corporate social capital and firm technology innovative capability, where market environment moderates the relationship.

**RESEARCH METHODS**

This section explains methods adopted for this study on data collection and analysis. We begin by sampling.

**Sampling**
In order to maximise relevance of the research to the samples, we sampled enterprises classified as innovative enterprises by the relevant Chinese authorities\(^1\). In total, 459 companies in China (including Hong Kong) were surveyed. Excluding 56 incomplete questionnaires and responses 111 invalid samples (i.e., who did not fulfil the classification of innovative enterprises in China), we included data collected from 292 innovative companies from 24 provinces/regions in China. Descriptive analyses showed that our samples were mainly from Hubei (40.07%), Chongqing (16.44%), Sichuan (10.96%) and Beijing (9.59%). Majority of the companies participated in this study were limited companies (69%) and public companies (21%). Among the samples, 61 percent were private companies, 17% were state-holding companies and 15% were wholly state-owned companies. The valid data covered more than a dozen major industries, such as manufacturing, energy, chemical, bio-pharmaceutical, electronics, information technology, information communication technology, transportation and aerospace industries. The descriptive analyses on company sizes and years of establishment also indicated a wide-ranged selection of companies.

**Measures – Item Development and Procedure**

In order to contextualise measurements in the research context, we interviewed 20 managers regarding firm innovation capabilities, corporate social capital and external environmental factors. After compiling their responses, we incorporated several items from relevant Western studies and Chinese literature (e.g., Teece, 1986; Di Benedetto, DeSarbo & Song, 2008; Govindarajan & Kopalle, 2004; Wang et al., 2004). We then eliminated some items which were thought to be inadequate by several managers from different functional departments in seven innovative enterprises located in Beijing, Shanghai, Wuhan and Chongqing. We also consulted five senior Chinese professors in the field and made further amendments in wording the measures. Thus, we used six items for technology innovative capabilities, eight for market innovative capabilities, 10 for external corporate social capital, nine for internal corporate social capital, three for technology environment and four for market environment. We measured responses on a Likert scale (1 represents extremely disagree; 7 represents

\(^1\) Detailed definitions and references may be obtained from the first author.
extremely agree). Statistic testing suggested that the developed measures were reliable (the $\alpha$ values were above 0.7).

**Data Analysis**

After having concluded the suitability of the data collected (skewedness < 2; kurtosis < 5), we used structured equation modeling to examine the direct relationships between corporate social capital and innovative capabilities. We then used regression analysis to determine the moderating effects of environment factors on the hypothesised relationships. The preliminary results of these analyses are explained in the next section.

**RESULTS**

The preliminary structured equation modeling results suggested that, in accordance with our expectations and the existing literature, there were positive correlations between corporate social capital and firm innovative capabilities on all dimensions. However, the regression analysis results suggested the moderating effects of technology and market environment varied depending on the tested relationships.

Our results indicated that the external corporate social capital has a strong positive correlation with firm market innovative capability ($r = 0.647; p=0.000$) and firm technology innovative capability ($r = 0.748; p = 0.000$). In a similar vein, the internal corporate social capital also significantly and positively correlated with firm market innovative capability ($0.408; p = 0.000$) and firm technology innovative capability ($0.558; p = 0.000$). Moreover, the results suggested that the level of technology environment dynamics has a reversed moderating effect on the correlation between external corporate social capital and firm technology innovative capability ($r = -0.064; p= 0.019$), as well as on the correlation between external corporate social capital and firm innovative market capability ($r = -0.078; p= 0.003$). Therefore, hypotheses 1a and 1b were supported. Similarly, the data analyses showed that the level of market environment dynamics has a reversed moderating effect on the correlation between external corporate social capital and firm technology innovative capability ($r = -0.60; p = 0.031$), and
on the correlation between external corporate social capital and firm market innovative capability ($r = -0.112; p = 0.000$). Thus, hypotheses 2a and 2b were also supported. However, technology environment did not appear to moderate the positive correlation between internal corporate social capital and firm technology innovative capability at an acceptable confidence interval ($r = -0.060; p = 0.105$), although its negative moderating effect was significant between the internal corporate social capital and firm market innovative capability ($r = -0.089; p = 0.006$). Therefore, hypothesis 3a was partially supported, while hypothesis 3b was fully supported. Finally, the positive moderating effect of market environment dynamics on the relationship between internal corporate capital and firm technology innovative capability was found to be statically significant ($r = 0.121; p = 0.001$), whereby a negative moderating effect of market environment was found between internal corporate capital and firm market innovative capability ($r = -0.147; p = 0.000$). Therefore, hypotheses 4a and 4b were also supported.

**DISCUSSION**

The preliminary results and analyses of this study indicate that corporate social capital is probably a significant contributor to firm innovative capabilities. The contributions of corporate social capital to firm innovative capabilities may be attributed to both internal and external corporate social capital, which appear to be important for both firm technology and market innovative capabilities. These findings appear consistent with the existing literature. Our findings also suggest that corporate social capital seems to be more important to firm technology innovative capabilities than firm market innovative capabilities, while a firm’s external corporate social capital may contribute more to its innovative capabilities than the internal corporate social capital. The significance of external corporate social capital may relate to the Chinese culture of ‘guanxi’ (Chen & Chen, 2004), whereby a firm’s external networks (especially with government) might increase its chances of gaining financial and policy advantages over the competitors on innovation. Given the embryonic status of the literature on corporate social capital and innovative capabilities in organisations, our preliminary findings are encouraging for further studies looking into the theoretical perspectives and conceptual space on the relationships between the two concepts, especially at deeper levels. The above findings appear to
indicate that corporate social capital and firm innovative capabilities are multi-dimensional concepts. The future research into these areas may prove fruitful further modelling the respective dimensions.

On the other hand, the findings on the moderating effects of environmental factors are more complicated and elusive. While both technical and market environment dynamics seem to have constant negative moderating effects on the relationship between external corporate social capital and firm innovative capabilities (i.e., the market environment is more dynamic, the less strong the correlation between external corporate social capital and firm innovative resources), they did not appear to have similar effects on the relationship between internal corporate social capital and firm innovative capabilities. The technology environment did not seem to have significant effect on the relationship between internal corporate social capital and firm market innovative capability. Both technology and market environment dynamics have negative moderating effects on the relationship between internal corporate social capital and firm technology innovative capabilities. This implies that when the environment is less dynamic, the correlation between internal corporate social capital and technology innovative capabilities is probably stronger. Interestingly, market environment dynamics appear to be the only factor which positively moderates the relationship between (internal) corporate social capital and (market) innovative capabilities. The finding suggests that when the market environment is more dynamic, the potential contribution of internal corporate social capital to firm market innovative capability is likely to be greater.

There are several limitations of the present paper. To begin with, this research was conducted in China and its measures were highly localised. Although we have taken sound measures to ensure the validity and reliability of the adopted survey instruments, the generalisability of the results may not be granted in other societies. Furthermore, we would also like to acknowledge that this paper has reported part of the preliminary results of an on-going research. Further data collection and analyses may reveal other insightful findings.

CONCLUSION
This paper studied the relationships between corporate social capital and firm innovative capabilities, considering the moderating effects of technology and market environment dynamics. Its results suggested that both internal and external corporate social capital significantly and positively correlated to technology and market innovative capabilities in the studied 292 Chinese companies. The moderating effects of technology and market environment dynamics were less clear and inconclusive. Future research may look into these areas to further investigate these results at more in-depth theoretical and conceptual levels and in other societal contexts.

REFERENCES


